

DEPARTMENT OF THE ARMY OFFICE OF THE SURGEON GENERAL 5109 LEESBURG PIKE FALLS CHURCH, VA 22041-3258

March 26, 1993



REPLY TO ATTENTION OF Preventive Medicine Consultants Division

US Nuclear Regulatory Commission Region I 475 Allendale King of Prussia, Pennsylvania 19406

Dear Sir:

Enclosed are two copies of a request to amend Byproduct Material License Number 08-01738-02, Walter Reed Army Medical Center, Washington, DC.

Recommend approval.

Sincerely,

Peter H. Myers Colonel, U.S. Army Radiological Hygiene Consultant

Enclosure

CF: HQ, USAEHA, ATTN: HSHB-MR-H, APG, MD 21010-5422

OFFICIAL RECORD COPY ML 10

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DEPARTMENT OF THE ARMY WALTER REED ARMY MEDICAL CENTER WASHINGTON, DC 20307-5001

REPLY TO ATTENTION OF:

1 0 MAR 1993

HSHL-HP (385-11m)

MEMORANDUM THRU

Commander, US Army Health Services Command, ATTN: HSCL-P, Fort 22 MAR 93 Sam Houston, TX 78234-6000

HQDA (SGPS-PSP-E), 5109 Leesburg Pike, Falls Church, VA 22041-3258

FOR US Nuclear Regulatory Commission, Region I, Nuclear Material Safety Section A, 475 Allendale Road, King of Prussia, PA 19406

SUBJECT: Amendment of US Nuclear Regulatory Commission License No. 08-01738-02

1. Request that NRC License No. 08-01738-02 for Walter Reed Army Medical Center (WRAMC) be amended to include an additional location where radioactive material will be used, Form NRC-313M, Item 1b (Enclosure 1). All existing procedures instituted by the Health Physics Office to ensure the safe handling of radioactive material in a laboratory environment will apply at this location.

2. Enclosed is a floor plan of the Gillette building (Enclosure 2), and a copy of part of the lease agreement between the US Government and MC-270, Inc. (Enclosure 3). At the current time two small research groups of less than ten people each are planning to use this facility for research involving radioactive material. They will be using only a few rooms per group, the remainder of the area will house administrative areas and research not involving radioactive material.

3. The isotope usage at this facility is currently planned to be H-3, C-14, Cr-51, Fe-59, I-125 RIA kits and Tc-99m. Less than 10 mCi of Cr-51, I-125 and Fe-59; 25 mCi of H-3, and C-14; and up to 100 mCi of Tc-99m are currently anticipated. No work with volatile iodine is currently planned. As always all rooms, isotopes, limits and protocols will be approved by the Health Physics Office and the WRAMC Radiation Control Committee prior to implementation.

HSHL-HP (385-11m) SUBJECT: Amendment of US Nuclear Regulatory Commission License No. 08-01738-02

4. If any additional information is required please contact Mr. David Burton at (301) 427-5161.

FOR THE COMMANDER:

QUICK, хох LTC, MS Executive Officer

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NRC FORM 313M (8-86)	ΔΡΡΗΓΟΔ	U.S. NUCLEAR REG			Approved by OMB 3150-0041		
10 CFR 35		Expires 6-30-89					
INSTRUCTIONS wher appli 2055 ance Code licent	- Complete Items 1 through e necessary. Item 26 must be cation to : Director, Office of 5. Upon approval of this appl with the general requirements e of Federal Regulations, Parts se fee category should be state	26 if this & an initial applic completed on all application Nuclear Materials Safety an ication, the applicant will re contained in Title 10, Code 19, 20 and 35 and the licens d in Item 26 and the approp	ation or an application for re ts and signed. Retain one cop of Safeguards, U.S. Nuclear R sceive a Materials License. An of Federal Regulations, Part se fee provision of Title 10, Co priate fee enclosed.	newal of a license. Use suppler by. Submit original and one co legulatory Commission, Washin n NRC Materials License is issue 30, and the Licensee is subject ode of Federal Regulations, Par	nental sheets py of entire gton, D.C. ed in accord- to Title 10, rt 170. The		
1.a. NAME AND MAIL firm, clinic, physici	ING ADDRESS OF APPL ian, etc.) INCLUDE ZIP C	ICANT <i>(institution,</i> ODE	1.b. STREET ADDRES WILL BE USED //	SS(ES) AT WHICH RADIO f different from 1.a.) INC	ACTIVE MATERIAL		
Department Walter Ree Washingtor TELEPHONE NO.:	ed Army Medical 1, DC 20307-500 AREA CODE(301) <u>4</u>	Center 1 27-5104	The Gillette Building 270 Research Center 1413 Research Boulevard Rockville, MD 20850				
2. PERSON TO CONTA David W. 1 Health Phy TELEPHONE NO.:	ACT REGARDING THIS A Burton ysics, WRAMC AREA CODE (301)4	APPLICATION	3. THIS IS AN APPLI a D NEW LICENS b.	CATION FOR: <i>(Check ap</i> , se t to license no. <u>08</u> f license no	propriate item) 01738–02		
 INDIVIDUAL USEF supervise use of radio for each individual.) Radiation 	RS (Name individuals who pactive material. Complete Individuals app Control Committ	will use or directly Supplements A and B proved by the cee, Walter	5. RADIATION SAFETY OFFICER (RSO) (Name of person designated as radiation safety officer. If other than individual user, complete resu- me of training and experience as in Supplement A.)				
Reed Army	Medical Center		NO CHANGE				
6.a. RADIOACTIVE	MATERIAL FOR ME	DICAL USE NO C	CHANGE				
RADIOACTIVE I LISTED	MATERIAL DESI	MS POSSESSION RED LIMITS "X" (In millicuries)	ADDITION	AL ITEMS:	INAXIMUM INAXIMUM		
10 CFR 31.11 FOR IN	VITRO STUDIES		IODINE-131 AS IODIO OF HYPERTHYROIDI	DE FOR TREATMENT			
10 CFR 35.100, SCHEE	DULE A, GROUP I	AS NEEDED	PHOSPHORUS-32 AS FOR TREATMENT OF	SOLUBLE PHOSPHATE F POLYCYTHEMIA ND BONE METASTASES			
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10 CFR 35 100 SCHED			EFFUSIONS.	DE FOR TREATMENT	· · ·		
10 CFR 35.100, SCHED	DULE A, GROUP VI		XENON-133 AS GAS C BLOOD FLOW STUDI	DR GAS IN SALINE FOR ES AND PULMONARY			
6.b. RADIOACTIV	E MATERIAL FOR US	SES NOT LISTED IN	ITEM 6.a. (Sealed source 14(d) 10 CEB Part 35	es up to 3 mCi used for			
ELEMENT AND	MASS NUMBER	CHEMICAL AND/OR PHYSICAL FORM	MAXIMUM NUMBER OF MILLICURIES OF EACH FORM	DESCRIBE PURP	POSE OF USE		
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INFORMATION REQUIRED FOR ITEMS 7 THROUGH 23

For Items 7 through 23, check the appropriate box(es) and submit a detailed description of all the requested information. Begin each item on a separate sheet. Identify the item number and the date of the application in the lower right corner of each page. If you indicate that an appendix to the medical licensing guide will be followed, do not submit the pages, but specify the revision number and date of the referenced guide: Regulatory Guide 10.8 , Rev. _____ Date: _____

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7. MEDICAL ISOTOPES COMMITTEE NO CHANGE	15. GENERAL RULES FOR THE SAFE USE OF NO CHANGE RADIOACTIVE MATERIAL (Check One)				
Names and Specialties Attached; and	Appendix G Rules Followed; or				
Duties as in Appendix B; or (Check One)	Equivalent Rules Attached				
Equivalent Duties Attached	16. EMERGENCY PROCEDURES (Check One) NO CHANGE				
8. TRAINING AND EXPERIENCE NO CHANGE	Appendix H Procedures Followed; or				
Supplements A & B Attached for Each Individual User; and	Equivalent Procedures Attached				
Supplement A Attached for RSO.	17. AREA SURVEY PROCEDURES (Check One)				
9. INSTRUMENTATION (Check One) NO CHANGE	Appendix I Procedures Followed; or NO CHANGE				
Appendix C Form Attached; or	Equivalent Procedures Attached				
List by Name and Model Number	18. WASTE DISPOSAL (Check One) NO CHANGE				
10. CALIBRATION OF INSTRUMENTS NO CHANGE	Appendix J Form Attached; or				
Appendix D Procedures Followed for Survey Instruments; or	Equivalent Information Attached				
Equivalent Procedures Attached; and	THERAPEUTIC USE OF RADIOPHARMACEUTICALS 19. (Check One) NO CHANGE				
Appendix D Procedures Followed for Dose Calibrator; or	Appendix K Procedures Followed; or				
Equivalent Procedures Attached	Equivalent Procedures Attached				
11. FACILITIES AND EQUIPMENT	20. THERAPEUTIC USE OF SEALED SOURCES $_{\rm NO}$ $_{\rm CHANGE}$				
X Description and Diagram Attached	Detailed Information Attached; and				
12. PERSONNEL TRAINING PROGRAM NO CHANGE	Appendix L Procedures Followed; or (Check One)				
Description of Training Attached	Equivalent Procedures Attached				
13. PROCEDURES FOR ORDERING AND RECEIVING RADIOACTIVE MATERIAL NO CHANGE	PROCEDURES AND PRECAUTIONS FOR USE OF 21. RADIOACTIVE GASES (e.g., Xenon – 133) NO CHANGE				
Detailed Information Attached	Detailed Information Attached				
PROCEDURES FOR SAFELY OPENING PACKAGES 14. CONTAINING RADIOACTIVE MATERIALS	22. PROCEDURES AND PRECAUTIONS FOR USE OF RADIOACTIVE MATERIAL IN ANIMALS NO CHANGE				
(Check One)	Detailed Information Attached				
Appendix F Procedures Followed; or NO CHANGE	PROCEDURES AND PRECAUTIONS FOR USE OF 23. RADIOACTIVE MATERIAL SPECIFIED IN ITEM 6.b				
Equivalent Procedures Attached	Detailed Information Attached NO CHANGE				
NRC FORM 313M					

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<u>.</u>		24. PERS	DNNEL MONITOR	ING DEVICES	······································	
(Che	TYPE ck appropriate box)		SUPPLIER		EXCHANGE F	REQUENCY
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c. WRIST	TLD		NO CHANGE	· · · · · · · · · · · · · · · · · · ·		
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·	25	5. FOR PRIVATE	PRACTICE APPLI	CANTS ONLY		·····
a. HOSPIT	AL AGREEING TO ACCEP	T PATIENTS CONT	AINING RADIOACTIV	E MATERIAL		
			· · ·	5 ATTACH A COP SIGNED BY TH	Y OF THE AGREEM	ENT LETTER STRATOR.
MAILIN	G ADDRESS			c. WHEN REQUES	TING THERAPY PRO Y OF RADIATION SA	CEDURES, AFETY PRECAU-
CITY			STATE ZIP CODE	TIONS TO BE TA RADIATION DE	AKEN AND LIST AVA	AILABLE ENTS.
		(This item m	26. CERTIFICATE ust be completed by	(applicant)	, , , , <u>, , , , , , , , , , , , ,</u>	
The app	licant and any official execu	uting this certificate of	on behalf of the applica	ant named in Item 1a ce	rtify that this application	on is prepared in
conform attached	ity with Title 10, Code of F hereto, is true and correct to	Federal Regulations, I the best of our know	Parts 30 and 35, and th wledge and belief.	at all information conta	ined herein, including a	any supplements
			· · · · · · · · · · · · · · · · · · ·	b. APPLICANT OR	CERTIFYING OFFIC	(Signature)
	a. LICENSE	FEE REQUIRED		Mat	D/ K	/
	(See Section	170.31, 10 CFR 170)		(1) NAME UVB	TD THE ME	
(1) LICEN	SE FEE CATEGORY:	 סד		(2) TITLE	UK., 1/10, MS)
	<u>_</u> E	xception, 100	CFR170.11	LXECUTIVE Of	Ticer	
(2) LICEN	SE FEE ENCLOSED: \$	(a) (5)		-		

PRIVACY ACT STATEMENT

Pursuant to 5 U.S.C. 552a(e)(3), enacted into law by section 3 of the Privacy Act of 1974 (Public Law 93-579), the following statement is furnished to individuals who supply information to the Nuclear Regulatory Commission on NRC Form 313M. This information is maintained in a system of records designated as NRC-3 and described at 40 Federal Register 45334 (October 1, 1975).

- 1. AUTHORITY Sections 81 and 161(b) of the Atomic Energy Act of 1954, as amended (42 U.S.C. 2111 and 2201(b)).
- 2. PRINCIPAL PURPOSE(S) The information is evaluated by the NRC staff pursuant to the criteria set forth in 10 CFR Parts 30-36 to determine whether the application meets the requirements of the Atomic Energy Act of 1954, as amended, and the Commission's regulations, for the issuance of a radioactive material license or amendment thereof.
- 3. ROUTINE USES The information may be used: (a) to provide records to State health departments for their information and use; and (b) to provide information to Federal, State, and local health officials and other persons in the event of incident or exposure, for their information, investigation, and protection of the public health and safety. The information may also be disclosed to appropriate Federal, State, and local agencies in the event that the information indicates a violation or potential violation of law and in the course of an administrative or judicial proceeding. In addition, this information may be transferred to an appropriate Federal, State, or local agency to the extent relevant and necessary for a NRC decision or to an appropriate Federal agency to the extent relevant and necessary for that agency's decision about you. A copy of the license issued will routinely be placed in the NRC's Public Document Room, 1717 H Street, N.W., Washington, D.C.
- 4. WHETHER DISCLOSURE IS MANDATORY OR VOLUNTARY AND EFFECT ON INDIVIDUAL OF NOT PROVIDING INFORMATION Disclosure of the requested information is voluntary. If the requested information is not furnished, however, the application for radioactive material license, or amendment thereof, will not be processed.
- 5. SYSTEM MANAGER(S) AND ADDRESS Director, Division of Fuel Cycle and Material Safety, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555.

STANDARD FORM 2 FEBRUARY 1865 EDITION GENERAL SERVICES	110	U.S. (GOVERNMENT	· · · · · · · · · · · · · · · · · · ·
ADMINISTRATION FPR (41 CFR) 1-16 501	PRA -		K KEAL PROP	
DATE OF LEASE Octobe	r 4, 1992		• <u>DACA-31-5</u> -92-	-332
THIS LEASE, made	and entered into this date	t by and between		
	MC-270, Inc.,	a corporation of	ganized and ex:	isting
whose address is	55 Railroad Av	under the laws o enue	of the State of	Maryland
	Greenwich, CT	06830 -		
and whose interest in	a the property hereinafter (described is that of ov	mer	
hereinafter called the	: Lessor, and the UNITED	STATES OF AMERICA,	hereinafter called the G	overnment:
WITNESSETH:	The parties hereto for the	e considerations hereinaft	er mentioned, covenant a	nd agree as follows
1. The Lesso	r hereby leases to the Gov	ernment the following de	scribed premises:	
Full-time, e	xclusive use of 4 Premises", compr	45,000 square fe	et of space, he	ereinafter called
as the Gille	tte Building, he:	reinafter called	I the "Building"	, as shown on
Exhibit "A",	attached hereto	, whose address	is 270 Research	Center,
1413 Researc	h Boulevard, Rocl	kville, Maryland	20850. The Le	eased Premises al
includes pav	ed parking for 9.	5 venicles.	•	
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to be used for	Government purpo	ses.		
2. TO HAVI Commencement Lease and co	E AND TO HOLD the sai Date, as define ntinuing for a p	d premises with their app d in Clause 17 of eriod of five (of the General () years therea	beginning on the Conditions of thi Eter, subject to termination
and renewal right	s as may be hereinafter set f	forth.		
3. The Gove	rnment shall pay the Lesse	or annual rent of \$	EE PARAGRAPH 19	
AND XHADIXX		******	{***************	**************************************
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The Governme	int may renew thi	s Lease for a t	erm of five (5)	years by providi
120 days pri	or to the last d	ay of the initi	al five-year le	ion not less than ase term. The
Government s	shall pay rent du	ring the renewa	l term as set fo	orth in Clause 19
except as ot	cherwise provided	for herein.	uis Lease Shall	remain the same
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C. The Lener shall formuly to the Government, as part of the renal consideration, the following: SEE ATTACHED - Paragraph 6 (continued) SEE ATTACHED - Paragraph 6 (continued) The Govern Provident and Islands and takes part hered: The Govern Provident and Islands of the tend of the tend (the following) The Govern Provident and Islands and Islands from P.A. May, 1970, indition). Exhibit "A" - map Exhibit "P" - Seolant specifications Exhibit "B" - janitorial services Exhibit "C" - government improvements Exhibit "P" - areas to be painted Exhibit "C" - government improvements Exhibit "P" - areas to be painted Exhibit "C" - government improvements Exhibit "P" - areas to be painted Exhibit "C" - government improvements Exhibit "P" - areas to be painted Exhibit "C" - government improvements Exhibit "P" - areas to be are preid/seeled a. The following charges were made in this less price to is creation: Condition No. 3 and 5 of SF 2 were modified. Condition No. 17 through 34 were added. IN WITNESS WHEREOF, the parise hereto have ference substrated their names as of the due first above writen. Isone Mc-270, Inc. Tax 1.D. No <u>5.2-1542743</u> Improve Inc.				· · ·
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7. The following are attached and made a part hereof: The General Provisions and Instructions (Standard Form 2.4, May, 1970, edition). Exhibit "A" - map Exhibit "A" - janitorial services Exhibit "B" - janitorial services Exhibit "O" - operating expenses Exhibit "O" - areas to be painted Exhibit "S" - areas to be carpeted/sealed 8. The following changes were made in this lease prior to its execution: Condition No. 1 and 5 of SF 2 was deleted. Condition No. 17 through 34 were added. IN WITNESS WHEREOF, the parties hereto have hereunito subscribed their names as of the date first above written. Condition No. 17 through 34 were added. IN WITNESS WHEREOF, the parties hereto have hereunito subscribed their names as of the date first above written. UNUTINESS WHEREOF, the parties hereto have hereunito subscribed their names as of the date first above written. UNUTINESS WHEREOF, the parties hereto have hereunito subscribed their names as of the date first above written. UNUTINESS WHEREOF, the parties hereto have hereunito subscribed their names as of the date first above written. UNUTINESS WHEREOF, the parties hereto have hereunito subscribed their names as of the date first above written. UNUTINESS WHEREOF, the parties hereto have hereunito subscribed their names as of the date first above thereunito subscribed their names as of the date first above thereunito subscribed their names as of				
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U.S. NUCLEAR JULATORY COMMISSION 2 NRC Form 374A OF PAGES (5-34) License number 08-01738-02 MATERIALS LICENSE Docket or Reference number SUPPLEMENTARY SHEET 030-01317 Amendment No. 64 (Items 6., 7. & 8. continued) 6. Byproduct, source, and/or 7. Chemical and/or physical 8. Maximum amount that form licensee may possess at special nuclear material any one time under this license U. Cesium 137 U. Sealed sources V. Cobalt 60 V. Sealed sources W. Any W. 100 microcuries W. Americium 241 X. Americium 241 X. Sealed s Y. sealed sources and foils Y. 1 curie Y. Nickel 63 Z. Sealed sources . 1 curie Z. Iodine 129 5 Kilograms 5 kilograms AA. Any AA. Thorium **BB.** Uranium BB. Any CC4400 kilograms Plated Metal CC. Uranium depleted in Uranium 235 Sealed sounces DD DD. Americium 241 Sealed/Source EE. Cesium 137 FF. Cesium 137 9 Authorized use Medical research, diagnosis and therapy, research and development as defined in 10 CFR 30.4. Research and development as defined in 10 CFR 30.4; teaching. A. through T. U. through Z. Teaching and laboratory research. AA. and BB. CC. Shielding. Standards and reference sources. DD. for calibration of EE. In an instruments. Instrument calibration. FF. CONDITIONS 10. Location of use: Walter Reed Army Medical Center, Washington, D. C.; WRAMC Forest Glen Section and Annex, Silver Spring, Maryland; Walter Reed Army Institute of Research Animal Holding Facility, Fort Meade, Maryland; U.S. Army Medical Laboratory, WRAMC Department of Pathology, Fort Meade, Maryland; and U.S. Army Institute of Dental Research Facility, Fort Meade, Maryland; Rickman Building, 13 Taft Court, Rockville, Maryland and Gillette Building, 270 Research Center, 1413 Research Boulevard, Rockville, Maryland. Radiation Safety Officer: LTC Arthur G. Samiljar 11. 2 (PARTIAL

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	NRC Fo (5-84)	urm 374A U.S. NUCLEARGULATORY COMMIS	SION PAGE 3 OF 4 PAGES
			08-01738-02
		MATERIALS LICENSE	Docket or Reference number
		SUPPLEMENTARY SHEET	030-01317
_		·	Amendment No. 64
	(Con	tinued) CONDITIONS	
	12	A licensed material shall be used by or	r under the supervision of individuals
	16.	designated by the licensee's Radiation Chairman.	a Safety Committee, Col. Joan T. Zajtchuk,
		B. The use of licensed material in or on in Section 35.2 of 10 CFR Part 35.	humans shall be by a physician as defined
	-	C. Physicians designated to use licensed training criteria established in 104CF	material in or on humans shall meet the \mathbb{R} Part 35, Subpart J.
	13.	Experimental animals administered licensed used for human consumption.	materials or their products shall not be
	14.	In lieu of using the conventional radiation yellow background) as provided in Section 2 licensee is hereby authorized to label dete licensed material and used in gas chromatog or stamped radiation caution symbols without	n caution colors (magenta or purple on 20.203(a)(1), of 10, CFR Part 20, the ector cells and cell baths, containing graphy devices, with conspicuously etched at a golor requirement.
	15.	Detector cells containing a titanium tritid only be used in conjunction with a properly which prevents for temperatures from rexcee	e for a scandium tritide foil shall person ing temperature control mechanism and gonat specified by the manufacturer.
	16.	Notwithstanding the requirements of 10 CH for medical use any syproduct material of a Administration has accepted a "Notice of 61 Drug" (IND).	35.49 (a) and (b) the licensee may use bagent bit for which the Food and Drug aimed investigational Exemption for a New
	17.	The licensee may transport licensed materia 10 CFR 71, "Packaging and Transportation of	al in accordance with the provisions of Radioactive Material."
国の国の国の国の国の国の国の国の国	18.	If only a single radionuclide specified in limit is the quantity specified in <u>Schedule</u> NUREG-0767. If two or more radionuclides a each is determined as follows: the sum of divided by the quantities of those radionuc <u>Limiting Possession Limits</u> , NUREG-0767 shall	NUREG 0767, is possessed, the possession of <u>Limiting Possession</u> Limits, are possessed, the possession limit for the quotients of the quantities possessed lides specified in the <u>Schedule of</u> 1 not exceed unity.
NORCHCHC.	19.	The licensee is authorized to hold radioact less than 90 days for decay-in-storage befo	tive material with a physical half-life of ore disposal in ordinary trash provided:
CHORORY		A. Radioactive waste to be disposed of in minimum of 10 half-lives.	n this manner shall be held for decay a
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AUG 23 1993

License No. 08-01738-02 Docket No. 030-01317 Control No. 118276

Department of the Army ATTN: DASG-PSP-E (COL Peter Myers) 5109 Leesburg Pike Falls Church, Virginia 22041-3258

Dear Colonel Myers:

Please find enclosed an amendment to your NRC Material License.

Please review the enclosed document carefully and be sure that you understand all conditions. If there are any errors or questions, please notify the Region I Material Licensing Section, (215) 337-5093, so that we can provide appropriate corrections and answers.

Please be advised that you must conduct your program involving licensed radioactive materials in accordance with the conditions of your NRC license, representations made in your license application, and NRC regulations. In particular, please note the items in the enclosed, "Requirements for Materials Licensees."

Since serious consequences to employees and the public can result from failure to comply with NRC requirements, the NRC expects licensees to pay meticulous attention to detail and to achieve the high standard of compliance which the NRC expects of its licensees.

You will be periodically inspected by NRC. A fee may be charged for inspections in accordance with 10 CFR Part 170. Failure to conduct your program safely and in accordance with NRC regulations, license conditions, and representations made in your license application and supplemental correspondence with NRC will result in prompt and vigorous enforcement action against you. This could include issuance of a notice of violation, or in case of serious violations, an imposition of a civil penalty or an order suspending, modifying or revoking your license as specified in the General Policy and Procedures for NRC Enforcement Actions, 10 CFR Part 2, Appendix C.

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ML 10

Department of the Army

-2-

We wish you success in operating a safe and effective licensed program.

Sincerely,

Original Signed By: David G. Mann

David G. Mann Nuclear Materials Safety Branch Division of Radiation Safety and Safeguards

Enclosures:

- 1. Amendment No. 64
- 2. Requirements for Materials Licensees
- 3. NRC Forms 3 and 313
- 4. 10 CFR Parts 2, 19, 20, 30, 35 and 170

DRSS:RI Mann/srb

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HUMAN GENOME SCIENCES, INC. 9620 MEDICAL CENTER DRIVE SUITE 300 ROCKVILLE, MD 20850-3338 (301) 309-8504 (301) 309-8512 FAX

August 18, 1993

08-01738-02 030-01317

Nuclear Regulatory Commission 475 Allendale Road King of Prussia, PA 19406

Attn: Mr. David Mann

Dear David,

Pursuant to our conversation today, I am enclosing material that I believe is necessary to decommission the Walter Reed space at 9620 Medical Center Drive. Walter Reed's control number is 118276.

I appreciate your assistance in this matter and would also appreciate if you would copy me on the final notification to Walter Reed.

I have enclosed my card should you need any further assistance from me.

Thank you for your expedition of this matter.

Sincerely,

James R. Burtnett Director of Human Resources

Encl



JAMES R. BURTNETT, JR DIRECTOR OF HUMAN RESOURCES

HUMAN GENOME SCIENCES, INC. 9620 MEDICAL CENTER DRIVE SUITE 300 ROCKVILLE, MD 20850-3338 (301) 251-6021 (301) 309-8512 FAX

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DEPARTMENT OF THE ARMY WALTER REED ARMY INSTITUTE OF RESEARCH WALTER REED ARMY MEDICAL CENTER WASHINGTON, D.C. 20307-5100



08-01738-02

036-01317

IN REPLY REFER TO:

August 16, 1993

Office of the Director

Mr. James R. Burtnett Human Genome Sciences, Inc. 9620 Medical Center Drive Rockville, Maryland 20850

Dear Mr. Burtnett:

The attached report and accompanying data are submitted for your review and use in obtaining an amendment to your radioactive material use license from the State of Maryland Department of the Environment. The radioactivity surveys performed by the Health Physics Office of the Walter Reed Army.Medical Center clearly show the space now being leased by the Walter Reed Army Institute of Research (WRAIR) is free of any residual radioactivity above background.

Request you notify this office in writing if your company is willing to accept responsibility for the space indicated in light of the survey data submitted. This action will allow the WRAIR to drop the Medical Center Drive Building from its license and you to add the facility to your license.

Point of Contact for this action is Dr. Billy G. Bass, (202) 576 3428 if you have any questions concerning this matter.

Sincerely,

st J. Salvado August J. Salvada

Colonel, U.S. Army Director

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118276 1 9 1993



L 'ARTMENT OF THE ARMY WALTER REED ARMY MEDICAL CENTER WASHINGTON, DC 20307-5001



5 August 1993

MEMORANDUM FOR Director, Walter Reed Army Institute of Research, Washington, D.C.

SUBJECT: Decommissioning Survey for the Cellular Immunology Research Facility at Key West, Rockville, Maryland

1. References:

a. Title 10, Code of Federal Regulations, Part 20, Standards for Protection Against Radiation.

b. United States Nuclear Regulatory Commission Regulatory Guide 1.86, "Termination of Operating Licenses for Nuclear Reactors".

c. United States Nuclear Regulatory Commission Regulatory Guide 8.23, 1 January 1981, "Radiation Safety Surveys at Medical Institutions".

d. United States Nuclear Regulatory Commission, 1 July 1982, "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct, Source, or Special Nuclear Material".

2. Purpose: During the time period of 14 June through 28 July 1993, Health Physics Office personnel conducted a decommissioning survey of the Cellular Immunology Research Facility (CIRF) at Key West to verify that residual radioactivity was below unrestricted levels.

3. Conclusion: Based upon the results of this comprehensive survey, there is no contamination in excess of unrestricted levels in the CIRF and it may be released, contingent upon NRC approval, to the owner.

4. Facility History: The Cellular Immunology Research Facility has been on Walter Reed's NRC License since 13 April 1990 as a site using byproduct material in biomedical research. At one time or another all 27 labs were active restricted areas. While 25 mCi of H-3, 10 mCi of C-14, 30 mCi of P-32, 45 mCi of S-35, 5 mCi of Cr-51, and 10.1 mCi of I-125 were authorized for use, not all radionuclides were used in each laboratory. HSHL-HP 5 August 1993 SUBJECT: Decommissioning Survey for the Cellular Immunology Research Facility at Key West, Rockville, Maryland

5. Methodology:

a. Survey Preparation. All licensed byproduct material was removed from the labs before commencing the survey. Contamination surveys were conducted on potentially contaminated equipment before returning the items to WRAIR. Additionally, all areas were cleared of equipment, furniture, and supplies before surveying.

b. Survey Strategy. Since the NRC had not, at the time of this survey, published a regulatory guide on how to conduct a decommissioning survey, we formulated the following approach:

(1) Areas that had been restricted areas received the most thorough surveying with measurements and wipes taken in 2 feet by 2 feet areas on all horizontal surfaces and to a height of 4 feet on all walls.

(2) The remaining unrestricted areas (offices, rest rooms, conference room, break areas, hallways, etc.) were surveyed to ensure a representative sampling.

(3) Wipes were taken in all sink drains, fume hood ducts, and exhaust ducts within the facility.

(4) Acceptable limits from NRC Regulatory Guide 8.23, Tables 2 and 3, were used for removable and fixed contamination, respectively.

(5) All areas were monitored for all possible contaminants regardless of the actual radionuclides used in specific labs.

c. Survey Technique.

(1) Direct Measurements of Fixed Contamination.

(a) Gamma Emitters. Gamma radiation was monitored with energy compensated G-M tubes measuring micro-R per hour at a distance of two inches above counter tops, shelves, drawers, and floors. Background was measured to be 15 uR/hr using this instrument.

(b) Beta Emitters. Beta radiation was monitored with a tungsten shielded G-M probe attached to a scaler. The Minimum Detectable Activity (MDA) for C-14 was 490 dpm/20 square cm using a one minute count time at a distance of one inch above counter tops, shelves, drawers, and floors.

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HSHL-HP 5 August 1993 SUBJECT: Decommissioning Survey for the Cellular Immunology Research Facility at Key West, Rockville, Maryland

(2) Indirect Measurements of Removable Contamination.

(a) Swipes. Swipes were taken over an area of 300 square centimeters.

(b) Gamma Emitter Analysis. All swipes were first analyzed for gamma energy by a well counter with a sodium iodide detector. The MDA varied slightly from day to day, but it was consistently and substantially below 2,200 DPM/100 square cms for Cr-51 and 220 DPM/100 square cms for I-125.

(c) Beta Emitter Analysis. All swipes were analyzed for beta energy by a liquid scintillation counter. The MDA varied slightly from day to day, but it was consistently below 220 DPM/100 square cms for H-3, C-14, P-32, and S-35.

(3) Survey Quality Control.

(a) Survey Meters. The survey meters and scaler used were within calibration and had a battery and/or performance check prior to each use.

(b) Gamma Counter. The gamma well counters were routinely checked for constancy utilizing an I-129 source and for efficiencies utilizing Cr-51 and I-125 sources.

(c) Liquid Scintillation Counter. The LSCs performed self-quench corrections on each sample, and were routinely checked with H-3 and C-14 sources to ensure consistency.

6. Results. Included as enclosures are the results of the individual room and area surveys.

7. Recommendation. That the Walter Reed Army Institute of Research prepare for the return of the CIRF to its owner once the NRC sends their approval for releasing the facility.

8. POC for this survey is CPT Mark A. Melanson, Chief, Operations Branch, Health Physics Office, @ (301)-427-5104/5107.

ARTHUR G. SAMILJAN LTC, MS Chief, Health Physics Office

Encls

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KEY WEST DECOMMISSIONING SURVEY

Office - 1

REMOVABLE CONTAMINATION

Office Number 1 was surveyed for removable contamination on 28 Jun 93 by SPC Brinley. A total of 38 swipes were taken. See Attachment 1 for the location of each swipe.

The swipes were analyzed for gamma contamination, utilizing the LKB Gammawell Counter on 28 Jun 93. See Attachment 2 for the MDAs and associated efficiencies. No gamma contamination was found above 200 dpm for I-125 or above 2000 dpm for any other isotope.

The swipes were analyzed for beta contamination, utilizing the Beckman Liquid Scintillation Counter Model 5000 on 28 Jun 93. See Attachment 3 for the MDAs and associated efficiencies. No beta contamination was found above 200 dpm for any isotope.

FIXED CONTAMINATION

A fixed gamma survey was conducted on 28 Jun 93 by SPC Brinley. The highest exposure rate found was 15.9 uR/hr. The average exposure rate was approximately 9 uR/hr. See Attachment 4 for the location of readings taken.

A fixed beta survey was conducted on 26 Jul 93 by SPC Brinley. The highest number of counts found during a one minute count-time was 66 cpm. The average number of counts found during a one minute count-time was 30 cpm. See Attachment 5 for the location of readings taken.

As well as being reviewed at the time of the survey/receipt of laboratory results, all pertinent survey data was reviewed and compiled here by SFC Green on 8 Aug 93.

Key ^V st Decommissioning Survey

Removable Contamination Survey-Office 1 Scale 1 inch = 4 feet



QUALITY ASSURANCE REPORT - GAMMA FOR DATE: 06/28/93

	BKG	MDA	EFF / ISO
LKB:	•		• •
CHANNEL 1:	45 CPM	30.1 DPM	0.733 / I-125
CHANNEL 2:	194 CPM	669.3 DPM	0.068 / CR-51
BECKMAN:		а с с с с а	
CHANNEL 1:	N/A	N/A	N/A
CHANNEL 2:	N/A	N/A	N/A

ATTACHMENT 2

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QUALITY ASSURANCE REPORT - BETA FOR DATE: 06/28/93

	BKG	MDA	EFF / ISO
BECKMAN LSOUUTD:			
CHANNEL 1:	32 CPM	29.4 DPM	0.633 / H-3
CHANNEL 2:	28 CPM	18.0 DPM	0.965 / C-14
CHANNEL 3:	26 CPM	N/A	N/A
BECKMAN LS6800:	Ч. С		
CHANNEL 1:	N/A	N/A	N/A
CHANNEL 2:	N/A	N/A	N/A
CHANNEL 3:	N/A	N/A	N/A

ATTACHMENT 3

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Key __est Decommissioning Survey

Fixed Beta Contamination Survey-Office 1 Scale 1 inch = 4 feet



KEY WEST DECOMMISSIONING SURVEY

Office - 2

REMOVABLE CONTAMINATION

Office Number 2 was surveyed for removable contamination on 30 Jun 93 by SPC Brinley. A total of 27 swipes were taken. See Attachment 1 for the location of each swipe.

The swipes were analyzed for gamma contamination, utilizing the LKB Gammawell Counter on 30 Jun 93. See Attachment 2 for the MDAs and associated efficiencies. No gamma contamination was found above 200 dpm for I-125 or above 2000 dpm for any other isotope.

The swipes were analyzed for beta contamination, utilizing the Beckman Liquid Scintillation Counter Model 6800 on 30 Jun 93. See Attachment 3 for the MDAs and associated efficiencies: No beta contamination was found above 200 dpm for any isotope.

FIXED CONTAMINATION

A fixed gamma survey was conducted on 30 Jun 93 by SPC Brinley. The highest exposure rate found was 21.4 uR/hr. The average exposure rate was approximately 12 uR/hr. See Attachment 4 for the location of readings taken.

A fixed beta survey was conducted on 26 Jul 93 by SPC Brinley. The highest number of counts found during a one minute count-time was 54 cpm. The average number of counts found during a one minute count-time was 40 cpm. See Attachment 5 for the location of readings taken.

As well as being reviewed at the time of the survey/receipt of laboratory results, all pertinent survey data was reviewed and compiled here by SFC Green on 8 Aug 93.



Conducted by: SPC Brinley on 30 Jun 93
Lab analysis by (gamma): SSG Koelker on 30 Jun 93
(beta) : <u>SSG Koelker</u> on <u>30 Jun 93</u>
Reviewed by Donald Khan, on 10 Aur 93

QUALITY ASSURANCE REPORT - GAMMA FOR DATE: 06/30/93

	BKG	MDA	EFF / ISO
LKB:			•
CHANNEL 1:	54 CPM	45.5 DPM	0.530 / I-125
CHANNEL 2:	204 CPM	948.4 DPM	0.050 / CR-51
BECKMAN:			
CHANNEL 1:	N/A	N/A	N/A
CHANNEL 2:	N/A	N/A	N/A

ATTACHMENT 2

QUALITY ASSURANCE REPORT - BETA FOR DATE: 06/30/93

	.*	BKG	MDA E	FF / ISO
BECKMAN	L5000TD:			
CHANNEL	1:	N/A	N/A	N/A
CHANNEL	2:	N/A	N/A	N/A
CHANNEL	3:	N/A	N/A	N/A
	•			. · .

BEC	KMAN	L868	3 O O	

CHANNEL	1:	17	CPM	23.4	DPM	0.579/H-3
CHANNEL	2:	30	CPM	19.0	DPM	0.947/C-14
CHANNEL	3:	40	CPM	20.7	DPM	1.007/P-32

ATTACHMENT 3

Key ____st Decommissioning Survey

Fixed Gamma Contamination Survey-Office 2 Scale 1 inch = 4 feet



Key Vest Decommissioning Survey

Fixed Beta Contamination Survey-Office 2 Scale 1 inch = 4 feet



Reviewed by: Denald Kcheen on 10 Aug 93

KEY WEST DECOMMISSIONING SURVEY

Office - 3

REMOVABLE CONTAMINATION

Office Number 3 was surveyed for removable contamination on 6 Jul 93 by SSG Koelker. A total of 27 swipes were taken. See Attachment 1 for the location of each swipe.

The swipes were analyzed for gamma contamination, utilizing the LKB Gammawell Counter on 6 Jul 93. See Attachment 2 for the MDAs and associated efficiencies. No gamma contamination was found above 200 dpm for I-125 or above 2000 dpm for any other isotope.

The swipes were analyzed for beta contamination, utilizing the Beckman Liquid Scintillation Counter Model 6800 on 6 Jul 93. See Attachment 3 for the MDAs and associated efficiencies. No beta contamination was found above 200 dpm for any isotope.

FIXED CONTAMINATION

A fixed gamma survey was conducted on 6 Jul 93 by SSG Koelker. The highest exposure rate found was 17.4 uR/hr. The average exposure rate was approximately 8 uR/hr. See Attachment 4 for the location of readings taken.

A fixed beta survey was conducted on 26 Jul 93 by SPC Brinley. The highest number of counts found during a one minute count-time was 45 cpm. The average number of counts found during a one minute count-time was 25 cpm. See Attachment 5 for the location of readings taken.

As well as being reviewed at the time of the survey/receipt of laboratory results, all pertinent survey data was reviewed and compiled here by SFC Green on 8 Aug 93.

Key V At Decommissioning Survey

Removable Contamination Survey-Office 3 Scale 1 inch = 4 feet



Conducted by: <u>SSG Koelker</u> on <u>06 Jul 93</u> Lab analysis by (gamma): <u>SSG Koelker</u> on <u>06 Jul 93</u> (beta) : <u>SSG Koelker</u> on <u>06 Jul 93</u> Reviewed by: <u>maile</u> <u>Kheen</u> on <u>10 Aur</u> 93

QUALITY ASSURANCE REPORT - GAMMA FOR DATE: 07/06/93

	BKG	MDA	EFF / ISO
LKB:			
CHANNEL 1:	53 CPM	32.2 DPM	0.742 / I-125
CHANNEL 2:	198 CPM	709.2 DPM	0.065 / CR-51
BECKMAN:		н 	
CHANNEL 1:	52 CPM	22.1 DPM	1.075 / I-125
CHANNEL 2:	198 CPM	452.3 DPM	0.102 / CR-51

ATTACHMENT 2

QUALITY ASSURANCE REPORT - BETA FOR DATE: 07/06/93

BECKMAN	L5000TD:	BKG	MDA	EFF / ISO
CHANNEL	1:	N/A	N/A	N/A
CHANNEL	2:	N/A	N/A	N/A
CHANNEL	3:	N/A	N/A	N/A
BECKMAN	LS6800:			
CHANNEL	1:	17 CPM	23.4 DPM	0.579/H-3
CHANNEL	2:	30 CPM	19.0 DPM	0.947/C-14

20.7 DPM

1.007/P-32

40 CPM

CHANNEL 3:

ATTACHMENT 3

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Key West Decommissioning Survey

Fixed Gamma Contamination Survey-Office 3 Scale 1 inch = 4 feet



Key West Decommissioning Survey

Fixed Beta Contamination Survey-Office 3 Scale 1 inch = 4 feet



Conducted by: <u>SPC Brinley</u> on <u>26 Jul 93</u> All Measurements are counts in one minute

Reviewed by: 3<u>n</u> on 10 1993

Attachment 5

KEY WEST DECOMMISSIONING SURVEY

Office - 4

REMOVABLE CONTAMINATION

Office Number 4 was surveyed for removable contamination on 28 Jun 93 by SSG Koelker. A total of 46 swipes were taken. See Attachment 1 for the location of each swipe.

The swipes were analyzed for gamma contamination, utilizing the LKB Gammawell Counter on 28 Jun 93. See Attachment 2 for the MDAs and associated efficiencies. No gamma contamination was found above 200 dpm for I-125 or above 2000 dpm for any other isotope.

The swipes were analyzed for beta contamination, utilizing the Beckman Liquid Scintillation Counter Model 5000 on 28 Jun 93. See Attachment 3 for the MDAs and associated efficiencies. No beta contamination was found above 200 dpm for any isotope.

FIXED CONTAMINATION

A fixed gamma survey was conducted on 28 Jun 93 by SPC Brinley. The highest exposure rate found was 19.4 uR/hr. The average exposure rate was approximately 11 uR/hr. See Attachment 4 for the location of readings taken.

A fixed beta survey was conducted on 26 Jul 93 by SPC Brinley. The highest number of counts found during a one minute count-time was 36 cpm. The average number of counts found during a one minute count-time was 20 cpm. See Attachment 5 for the location of readings taken.

As well as being reviewed at the time of the survey/receipt of laboratory results, all pertinent survey data was reviewed and compiled here by SFC Green on 8 Aug 93.

Key W Decommissioning Survey

Removable Contamination Survey-Office 4 Scale 1 inch = 4 feet



Key W. Decommissioning Survey

Removable Contamination Survey-Office 4 Scale 1 inch = 4 feet



Conducted by: <u>SSG Koelker</u> on <u>28 Jun 93</u>
Lab analysis by (gamma): SSG Koelker on 28 Jun 93
(beta) : SSG Koelker on 28 Jun 93
And the same
Reviewed by: Mala Koneen on 10 lug 93

QUALITY ASSURANCE REPORT - GAMMA FOR DATE: 06/28/93

	BKG	MDA	EFF / ISO
LKB:			
CHANNEL 1:	45 CPM	30.1 DPM	0.733 / I-125
CHANNEL 2:	194 CPM	669.3 DPM	0.068 / CR-51
BECKMAN:		н С. С. С.	
CHANNEL 1:	N/A	N/A	N/A
CHANNEL 2:	N/A	N/A	N/A

ATTACHMENT 2

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QUALITY ASSURANCE REPORT - BETA FOR DATE: 06/28/93

BECKMAN L5000TD:	BKG	MDA	EFF / ISO
CHANNEL 1:	32 CPM	29.4 DPM	0.633 / H-3
CHANNEL 2:	28 CPM	18.0 DPM	0.965 / C-14
CHANNEL 3:	26 CPM	N/A	N/A
BECKMAN LS6800:			• •
CHANNEL 1:	N/A	N/A	N/A
CHANNEL 2:	N/A	N/A	N/A
CHANNEL 3:	N/A	N/A	N/A

ATTACHMENT 3

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Key Wast Decommissioning Survey

Fixed Gamma Contamination Survey-Office 4 Scale 1 inch = 4 feet

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Key West Decommissioning Survey

Fixed Beta Contamination Survey-Office 4 Scale 1 inch = 4 feet



Conducted by: <u>SPC Brinley</u> on <u>26 Jul 93</u> All Measurements are counts in one minute

Reviewed by: Male K Cheen on 10 aug 93

KEY WEST DECOMMISSIONING SURVEY

Office - 5

REMOVABLE CONTAMINATION

Office Number 5 was surveyed for removable contamination on 2 Jul 93 by SSG Koelker. A total of 40 swipes were taken. See Attachment 1 for the location of each swipe.

The swipes were analyzed for gamma contamination, utilizing the LKB Gammawell Counter on 2 Jul 93. See Attachment 2 for the MDAs and associated efficiencies. No gamma contamination was found above 200 dpm for I-125 or above 2000 dpm for any other isotope.

The swipes were analyzed for beta contamination, utilizing the Beckman Liquid Scintillation Counter Model 6800 on 2 Jul 93. See Attachment 3 for the MDAs and associated efficiencies. No beta contamination was found above 200 dpm for any isotope.

FIXED CONTAMINATION

A fixed gamma survey was conducted on 2 Jul 93 by SSG Koelker. The highest exposure rate found was 15.7 uR/hr. The average exposure rate was approximately 12 uR/hr. See Attachment 4 for the location of readings taken.

A fixed beta survey was conducted on 26 Jul 93 by SPC Brinley. The highest number of counts found during a one minute count-time was 49 cpm. The average number of counts found during a one minute count-time was 33 cpm. See Attachment 5 for the location of readings taken.

As well as being reviewed at the time of the survey/receipt of laboratory results, all pertinent survey data was reviewed and compiled here by SFC Green on 8 Aug 93.

Key ast Decommissioning Survey

Removable Contamination Survey-Office 5 Scale 1 inch = 4 feet



Conducted by: SSG Koelker on 02 Jun 93 Lab analysis by (gamma): <u>SSG Koelker</u> on <u>02 Jul 93</u> (beta) : <u>SSG Koelker</u> on <u>02 Jul 93</u> 1493 Reviewed by: on <u>10 0</u>

Key st Decommissioning Survey

Removable Contamination Survey-Office 5 Scale 1 inch = 4 feet



Conducted by: <u>SSG Koelker</u> on <u>02 Jun 93</u> Lab analysis by (gamma): <u>SSG Koelker</u> on <u>02 Jul 93</u> (beta) : <u>SSG Koelker</u> on <u>02 Jul 93</u>

Reviewed by: Unal <u>,</u> on <u>10</u> 593

Attachment 1

QUALITY ASSURANCE REPORT - GAMMA FOR DATE: 07/02/93

	BKG	MDA	EFF / ISO
LKB:			3
CHANNEL 1:	53 CPM	32.2 DPM	0.742 / I-125
CHANNEL 2:	198 CPM	709.2 DPM	0.065 / CR-51
BECKMAN:			
CHANNEL 1:	52 CPM	22.1 DPM	1.075 / I-125
CHANNEL 2:	198 CPM	452.3 DPM	0.102 / CR-51

ATTACHMENT 2

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QUALITY ASSURANCE REPORT - BETA FOR DATE: <u>07/02/93</u>

BECKMAN L5000TD:	BKG	MDA	EFF / ISO
CHANNEL 1:	N/A	N/A	N/A
CHANNEL 2:	N/A	N/A	N/A
CHANNEL 3:	N/A	N/A	N/A
BECKMAN LS6800:			
CHANNEL 1:	17 CPM	23.4 DPM	0.579/H-3
CHANNEL 2:	30 CPM	19.0 DPM	0.947/C-14
CHANNEL 3:	40 CPM	20.7 DPM	1.007/P-32

ATTACHMENT 3

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Key West Decommissioning Survey

Fixed Gamma Contamination Survey-Office 5 Scale 1 inch = 4 feet



Conducted by: <u>SSG Koelker</u> on <u>02 Jul 93</u> All Measurements in uR/hr _ on <u>10/11/93</u> Reviewed by: 100m



Conducted by: <u>SPC Brinley</u> on <u>26 Jul 93</u> All Measurements are counts in one minute

ien on 100 11893 Reviewed by:/ VMA

KEY WEST DECOMMISSIONING SURVEY

Office - 6

REMOVABLE CONTAMINATION

Office Number 6 was surveyed for removable contamination on 30 Jun 93 by SSG Koelker. A total of 110 swipes were taken. See Attachment 1 for the location of each swipe.

The swipes were analyzed for gamma contamination, utilizing the LKB Gammawell Counter on 30 Jun 93. See Attachment 2 for the MDAs and associated efficiencies. No gamma contamination was found above 200 dpm for I-125 or above 2000 dpm for any other isotope.

The swipes were analyzed for beta contamination, utilizing the Beckman Liquid Scintillation Counter Model 6800 on 30 Jun 93. See Attachment 3 for the MDAs and associated efficiencies. No beta contamination was found above 200 dpm for any isotope.

FIXED CONTAMINATION

A fixed gamma survey was conducted on 30 Jun 93 by SSG Koelker. The highest exposure rate found was 20.9 uR/hr. The average exposure rate was approximately 10 uR/hr. See Attachment 4 for the location of readings taken.

A fixed beta survey was conducted on 26 Jul 93 by SPC Brinley. The highest number of counts found during a one minute count-time was 67 cpm. The average number of counts found during a one minute count-time was 38 cpm. See Attachment 5 for the location of readings taken.

As well as being reviewed at the time of the survey/receipt of laboratory results, all pertinent survey data was reviewed and compiled here by SFC Green on 8 Aug 93.

Key \ ______st Decommissioning Survey





Conducted by: <u>SSG Koelker</u> on <u>30 Jun 93</u> Lab analysis by (gamma): <u>SSG Koelker</u> on <u>30 Jun 93</u> (beta) : <u>SSG Koelker</u> on <u>30 Jun 93</u> Reviewed by: <u>Mada Khean</u> on <u>10 Aug 93</u>



Removable Contamination Survey-Office 6 Scale 1 inch = 4 feet



QUALITY ASSURANCE REPORT - GAMMA FOR DATE: 06/30/93

	BKG	MDA	EFF / ISO
LKB:	•		
CHANNEL 1:	54 CPM	45.5 DPM	0.530 / I-125
CHANNEL 2:	204 CPM	948.4 DPM	0.050 / CR-51
BECKMAN:			
CHANNEL 1:	N/A	N/A	N/A
CHANNEL 2:	N/A	N/A	N/A

ATTACHMENT 2

QUALITY ASSURANCE REPORT - BETA FOR DATE: 06/30/93

BECKMAN	1.500070:	BKG	MDA	EFF / ISO
Ducidinia_	<u>19000101</u>			
CHANNEL	1:	N/A	N/A	N/A
CHANNEL	2:	N/A	N/A	N/A
CHANNEL	3:	N/A	N/A	N/A
BECKMAN	LS6800:			
CHANNEL	1:	17 CPM	23.4 DPM	0.579/H-3
CHANNEL	2:	30 CPM	19.0 DPM	0.947/C-14
CHANNEL	3:	40 CPM	20.7 DPM	1.007/P-32

ATTACHMENT 3

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Key West Decommissioning Survey

Fixed Gamma Contamination Survey-Office 6 Scale 1 inch = 4 feet



Key West Decommissioning Survey

Fixed Beta Contamination Survey-Office 6 Scale 1 inch = 4 feet



Conducted by: <u>SPC Brinley</u> on <u>26 Jul 93</u> All Measurements are counts in one minute

len on 10 aug 93 Reviewed by: 10na

KEY WEST DECOMMISSIONING SURVEY

Office - 7

REMOVABLE CONTAMINATION

Office Number 7 was surveyed for removable contamination on 30 Jun 93 by SSG Koelker. A total of 70 swipes were taken. See Attachment 1 for the location of each swipe.

The swipes were analyzed for gamma contamination, utilizing the LKB Gammawell Counter on 30 Jun 93. See Attachment 2 for the MDAs and associated efficiencies. No gamma contamination was found above 200 dpm for I-125 or above 2000 dpm for any other isotope.

The swipes were analyzed for beta contamination, utilizing the Beckman Liquid Scintillation Counter Model 6800 on 30 Jun 93. See Attachment 3 for the MDAs and associated efficiencies. No beta contamination was found above 200 dpm for any isotope.

FIXED CONTAMINATION

A fixed gamma survey was conducted on 30 Jun 93 by SSG Koelker. The highest exposure rate found was 19.4 uR/hr. The average exposure rate was approximately 11 uR/hr. See Attachment 4 for the location of readings taken.

A fixed beta survey was conducted on 26 Jul 93 by SPC Brinley. The highest number of counts found during a one minute count-time was 61 cpm. The average number of counts found during a one minute count-time was 55 cpm. See Attachment 5 for the location of readings taken.

As well as being reviewed at the time of the survey/receipt of laboratory results, all pertinent survey data was reviewed and compiled here by SFC Green on 8 Aug 93.

Key ' st Decommissioning Survey

Removable Contamination Survey-Office 7 Scale 1 inch = 4 feet



Conducted by: <u>SSG Koelker</u> on <u>30 Jun 93</u> Lab analysis by (gamma): <u>SSG Koelker</u> on <u>30 Jun 93</u> (beta) : <u>SSG Koelker</u> on <u>30 Jun 93</u> Reviewed by: <u>Mala</u> <u>Kheen</u>, on <u>10 Aur 93</u>

QUALITY ASSURANCE REPORT - GAMMA FOR DATE: 06/30/93

•	BKG	MDA	EFF / ISO
LKB:			
CHANNEL 1:	54 CPM	45.5 DPM	0.530 / I-125
CHANNEL 2:	204 CPM	948.4 DPM	0.050 / CR-51
BECKMAN:			
CHANNEL 1:	N/A	N/A	N/A
CHANNEL 2:	N/A	N/A	N/A

ATTACHMENT 2

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QUALITY ASSURANCE REPORT - BETA FOR DATE: 06/30/93

BECKMAN L5000TD:	BKG	MDA	EFF / ISO
CHANNEL 1:	N/A	N/A	N/A
CHANNEL 2:	N/A	N/A	N/A
CHANNEL 3:	N/A	N/A	N/A
	. 1		
BECKMAN LS6800:			
CHANNEL 1:	17 CPM	23.4 DPM	0.579/H-3
CHANNEL 2:	30 CPM	19.0 DPM	0.947/C-14
CHANNEL 3:	40 CPM	20.7 DPM	1.007/P-32

ATTACHMENT 3

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Key West Decommissioning Survey

Fixed Gamma Contamination Survey-Office 7 Scale 1 inch = 4 feet



Conducted by: SSG Koelker on 30 Jun 93 All Measurements, in uR/hr an ! on 10 aur 93 Reviewed by:

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Key est Decommissioning Survey

Fixed Beta Contamination Survey-Office 7 Scale 1 inch = 4 feet



Conducted by: <u>SPC Brinley</u> on <u>26 Jul 93</u> All Measurements are counts in one minute

on 10 aug 93 Reviewed by:

KEY WEST DECOMMISSIONING SURVEY

Office - 8

REMOVABLE CONTAMINATION

Office Number 8 was surveyed for removable contamination on 1 Jul 93 by SSG Koelker. A total of 113 swipes were taken. See Attachment 1 for the location of each swipe.

The swipes were analyzed for gamma contamination, utilizing the LKB Gammawell Counter on 1 Jul 93. See Attachment 2 for the MDAs and associated efficiencies. No gamma contamination was found above 200 dpm for I-125 or above 2000 dpm for any other isotope.

The swipes were analyzed for beta contamination, utilizing the Beckman Liquid Scintillation Counter Model 6800 on 1 Jul 93. See Attachment 3 for the MDAs and associated efficiencies. No beta contamination was found above 200 dpm for any isotope.

FIXED CONTAMINATION

A fixed gamma survey was conducted on 1 Jul 93 by SSG Koelker. The highest exposure rate found was 13.6 uR/hr. The average exposure rate was approximately 12 uR/hr. See Attachment 4 for the location of readings taken.

A fixed beta survey was conducted on 26 Jul 93 by SPC Brinley. The highest number of counts found during a one minute count-time was 64 cpm. The average number of counts found during a one minute count-time was 45 cpm. See Attachment 5 for the location of readings taken.

As well as being reviewed at the time of the survey/receipt of laboratory results, all pertinent survey data was reviewed and compiled here by SFC Green on 8 Aug 93.



Attachment 1

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Attachment 1

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QUALITY ASSURANCE REPORT - GAMMA FOR DATE: 07/01/93

	BKG	MDA	EFF / ISO
LKB:			
CHANNEL 1:	54 CPM	45.5 DPM	0.530 / I-125
CHANNEL 2:	204 CPM	948.4 DPM	0.050 / CR-51
BECKMAN:			
CHANNEL 1:	N/A	N/A	N/A
CHANNEL 2:	N/A	N/A	N/A

ATTACHMENT 2

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QUALITY ASSURANCE REPORT - BETA FOR DATE: 07/01/93

BECKMAN L5000TD:	BKG	MDA	EFF / ISO
CHANNEL 1:	N/A	N/A	N/A
CHANNEL 2:	N/A	N/A	N/A
CHANNEL 3:	N/A	N/A	N/A
		•	
BECKMAN LS6800:			
CHANNEL 1:	17 CPM	23.4 DPM	0.579/H-3
CHANNEL 2:	30 CPM	19.0 DPM	0.947/C-14
CHANNEL 3:	40 CPM	20.7 DPM	1.007/P-32

ATTACHMENT 3

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Attachment 4

KEY WEST DECOMMISSIONING SURVEY

Office - 9

REMOVABLE CONTAMINATION

Office Number 9 was surveyed for removable contamination on 16 Jul 93 by SPC Brinley. A total of 50 swipes were taken. See Attachment 1 for the location of each swipe.

The swipes were analyzed for gamma contamination, utilizing the Beckman Gammawell Counter on 16 Jul 93. See Attachment 2 for the MDAs and associated efficiencies. No gamma contamination was found above 200 dpm for I-125 or above 2000 dpm for any other isotope.

The swipes were analyzed for beta contamination, utilizing the Beckman Liquid Scintillation Counter Model 5000 on 16 Jul 93. See Attachment 3 for the MDAs and associated efficiencies. No beta contamination was found above 200 dpm for any isotope.

FIXED CONTAMINATION

A fixed gamma survey was conducted on 16 Jul 93 by SSG Koelker. The highest exposure rate found was 13.2 uR/hr. The average exposure rate was approximately 9.5 uR/hr. See Attachment 4 for the location of readings taken.

A fixed beta survey was conducted on 26 Jul 93 by SPC Brinley. The highest number of counts found during a one minute count-time was 92 cpm. The average number of counts found during a one minute count-time was 70 cpm. See Attachment 5 for the location of readings taken.

As well as being reviewed at the time of the survey/receipt of laboratory results, all pertinent survey data was reviewed and compiled here by SFC Green on 8 Aug 93.


QUALITY ASSURANCE REPORT - GAMMA FOR DATE: 07/16/93

	BKG	MDA	EFF / ISO
LKB:	۰. ۲		
CHANNEL 1:	46 CPM	32.8 DPM	0.680 / I-125
CHANNEL 2:	194 CPM	724.5 DPM	0.063 / CR-51
BECKMAN:		1	
CHANNEL 1:	50 CPM	23.3 DPM	0.999 / I-125
CHANNEL 2:	198 CPM	393.6 DPM	0.118 / CR-51

ATTACHMENT 2

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QUALITY ASSURANCE REPORT - BETA FOR DATE:<u>07/16/93</u>

BECKMAN	L5000TD:	F	BKG	MD	A	EFF	/	ISO
CHANNEL	1:	31	CPM	28.8	DPM	0.636	/	H-3
CHANNEL	2:	28	CPM	18.1	DPM	0.962	1	C-14
CHANNEL	3:	25	СРМ	16.5	DPM	1.004	/	P-32
BECKMAN	LS6800:							
CHANNEL	1:	33	CPM	32.4	DPM	0.583	1	H-3
CHANNEL	2:	25	СРМ	17.2	DPM	0.954	1	C-14
CHANNEL	3:	21	CPM	14.9	DPM	1.011	/	P-32

ATTACHMENT 3

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Key ... st Decommissioning Survey

Fixed Gamma Contamination Survey-Office 9 Scale 1 inch = 4 feet



Attachment 9

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Key \ st Decommissioning Survey

Fixed Beta Contamination Survey-Office 9 Scale 1 inch = 4 feet



Conducted by: <u>SPC Brinley</u> on <u>26 Jul 93</u> All Measurements are counts in one minute

Reviewed by: 1mall K Cherry on 10 aug 93

KEY WEST DECOMMISSIONING SURVEY

Office - 10

REMOVABLE CONTAMINATION

Office Number 10 was surveyed for removable contamination on 7 Jul 93 by SSG Koelker. A total of 31 swipes were taken. See Attachment 1 for the location of each swipe.

The swipes were analyzed for gamma contamination, utilizing the LKB Gammawell Counter on 8 Jul 93. See Attachment 2 for the MDAs and associated efficiencies. No gamma contamination was found above 200 dpm for I-125 or above 2000 dpm for any other isotope.

The swipes were analyzed for beta contamination, utilizing the Beckman Liquid Scintillation Counter Model 6800 on 8 Jul 93. See Attachment 3 for the MDAs and associated efficiencies. No beta contamination was found above 200 dpm for any isotope.

FIXED CONTAMINATION

A fixed gamma survey was conducted on 7 Jul 93 by SSG Koelker. The highest exposure rate found was 12.3 uR/hr. The average exposure rate was approximately 6 uR/hr. See Attachment 4 for the location of readings taken.

A fixed beta survey was conducted on 26 Jul 93 by SPC Brinley. The highest number of counts found during a one minute count-time was 54 cpm. The average number of counts found during a one minute count-time was 40 cpm. See Attachment 5 for the location of readings taken.

As well as being reviewed at the time of the survey/receipt of laboratory results, all pertinent survey data was reviewed and compiled here by SFC Green on 8 Aug 93.

Rey V T Decommissioning Survey

Removable Contamination Survey-Office 10 Scale 1 inch = 4 feet



Conducted by: <u>SSG Koelker</u> on <u>07 Jul 93</u>
Lab analysis by (gamma): <u>SSG Koelker</u> on <u>08 Jul 93</u>
(beta) : <u>SSG Koelker</u> on <u>08 Jul 93</u>
Reviewed by mali K been on Influe 93
include as set of the
Attachment 1

QUALITY ASSURANCE REPORT - GAMMA FOR DATE: 07/08/93

	BKG	MDA	EFF / ISO
LKB:			•
CHANNEL 1:	52 CPM	33.7 DPM	0.702 / I-125
CHANNEL 2:	201 CPM	636.1 DPM	0.073 / CR-51
BECKMAN:			
CHANNEL 1:	N/A	N/A	N/A
CHANNEL 2:	N/A	N/A	N/A

ATTACHMENT 2

QUALITY ASSURANCE REPORT - BETA FOR DATE:<u>07/08/93</u>

BECKMAN	L5000TD:	BKG	MDA	EFF / ISO
CHANNEL	1:	N/A	N/A	N/A
CHANNEL	2:	N/A	N/A	N/A
CHANNEL	3:	N/A	N/A	N/A
BECKMAN	LS6800:			
CHANNEL	1:	39 CPM	36.4 DPM	0.561 / H-3
CHANNEL	2:	26 CPM	17.6 DPM	0.950 / C-14
CHANNEL	3:	24 CPM	16.1 DPM	1.002 / P-32

ATTACHMENT 3

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Key W T Decommissioning Survey

Fixed Gamma Contamination Survey-Office 10 Scale 1 inch = 4 feet



Conducted by: <u>SSG Koelker</u> on <u>07 Jul 93</u> All Measurements in uR/hr Reviewed by: <u>Mala K Man</u>on <u>10 Que 93</u>

Attachment 4

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Key W t Decommissioning Survey





Conducted by: <u>SPC Brinley</u> on <u>26 Jul 93</u> All Measurements are Gross Ope Minute Counts

hear on 10 aug 93 Reviewed by

KEY WEST DECOMMISSIONING SURVEY

Office - 11

REMOVABLE CONTAMINATION

Office Number 11 was surveyed for removable contamination on 2 Jul 93 by SSG Koelker. A total of 23 swipes were taken. See Attachment 1 for the location of each swipe.

The swipes were analyzed for gamma contamination, utilizing the Beckman Gammawell Counter on 3 Jul 93. See Attachment 2 for the MDAs and associated efficiencies. No gamma contamination was found above 200 dpm for I-125 or above 2000 dpm for any other isotope.

The swipes were analyzed for beta contamination, utilizing the Beckman Liquid Scintillation Counter Model 6800 on 3 Jul 93. See Attachment 3 for the MDAs and associated efficiencies. No beta contamination was found above 200 dpm for any isotope.

FIXED CONTAMINATION

A fixed gamma survey was conducted on 2 Jul 93 by SSG Webster. The highest exposure rate found was 21.9 uR/hr. The average exposure rate was approximately 9 uR/hr. See Attachment 4 for the location of readings taken.

A fixed beta survey was conducted on 26 Jul 93 by SPC Brinley. The highest number of counts found during a one minute count-time was 26 cpm. The average number of counts found during a one minute count-time was 22 cpm. See Attachment 5 for the location of readings taken.

As well as being reviewed at the time of the survey/receipt of laboratory results, all pertinent survey data was reviewed and compiled here by SFC Green on 8 Aug 93.

Key Wtht Decommissioning Survey

Removable Contamination Survey-Office 11 Scale 1 inch = 4 feet



Conducted by: SSG Koelker on 02 Jun 93 Lab analysis by (gamma): SSG Koelker on 03 Jun 93 (beta) : SSG Koelker on 03 Jun 93 Reviewed by: '3 on ll

Attachment 1

QUALITY ASSURANCE REPORT - GAMMA FOR DATE: 07/03/93

	1	BKG	MDA	EFF / ISO
LKB:				
CHANNEL 1	: 53	CPM 3	2.2 DPM	0.742 / I-125
CHANNEL 2	: 198	СРМ 70	9.2 DPM	0.065 / CR-51
BECKMAN:				
CHANNEL 1	: 52	CPM 2	2.1 DPM	1.075 / I-125
CHANNEL 2	: 198	CPM 45	2.3 DPM	0.102 / CR-51

ATTACHMENT 2

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QUALITY ASSURANCE REPORT - BETA FOR DATE: 07/03/93

	BKG	MDA	EFF / ISO
BECKMAN L5000TD:			·
CHANNEL 1:	N/A	N/A	N/A
CHANNEL 2:	N/A	N/A	N/A
CHANNEL 3:	N/A	N/A	N/A
BECKMAN LS6800:			
CHANNEL 1:	17 CPM	23.4 DPM	0.579/H-3
CHANNEL 2:	30 CPM	19.0 DPM	0.947/C-14
CHANNEL 3:	40 CPM	20.7 DPM	1.007/P-32

ATTACHMENT 3

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Key Vest Decommissioning Survey

Fixed Gamma Contamination Survey-Office 11 Scale 1 inch = 4 feet



Conducted by: <u>SSG Webster</u> on <u>02 Jun 93</u>

on 10 aug 9 3 Reviewed by

Key Wast Decommissioning Survey

Fixed Beta Contamination Survey-Office 11 Scale 1 inch = 4 feet



Conducted by: SPC Brinley on 26' Jul 93

em on 10 aug 93 Reviewed by

Attachment 5 -

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KEY WEST DECOMMISSIONING SURVEY

Office - 12

REMOVABLE CONTAMINATION

Office Number 12 was surveyed for removable contamination on 2 Jul 93 by SPC Brinley. A total of 48 swipes were taken. See Attachment 1 for the location of each swipe.

The swipes were analyzed for gamma contamination, utilizing the LKB Gammawell Counter on 2 Jul 93. See Attachment 2 for the MDAs and associated efficiencies. No gamma contamination was found above 200 dpm for I-125 or above 2000 dpm for any other isotope.

The swipes were analyzed for beta contamination, utilizing the Beckman Liquid Scintillation Counter Model 6800 on 2 Jul 93. See Attachment 3 for the MDAs and associated efficiencies. No beta contamination was found above 200 dpm for any isotope.

FIXED CONTAMINATION

A fixed gamma survey was conducted on 7 Jul 93 by SSG Koelker. The highest exposure rate found was 22.2 uR/hr. The average exposure rate was approximately 14 uR/hr. See Attachment 4 for the location of readings taken.

A fixed beta survey was conducted on 26 Jul 93 by SPC Brinley. The highest number of counts found during a one minute count-time was 55 cpm. The average number of counts found during a one minute count-time was 35 cpm. See Attachment 5 for the location of readings taken.

As well as being reviewed at the time of the survey/receipt of laboratory results, all pertinent survey data was reviewed and compiled here by SFC Green on 8 Aug 93.

Construction and the second

Removable Contamination Survey-Office 12 Scale 1 inch = 4 feet



Conducted by: <u>SPC Brinley</u> on 02 Jul 93 Lab analysis by (gamma): <u>SSG Koelker</u> on <u>02 Jul 93</u> (beta) : <u>SSG Koelker</u> on <u>02 Jul 93</u>

Attachment 1

on /

Reviewed by

QUALITY ASSURANCE REPORT - GAMMA FOR DATE: 07/02/93

		BKG	MDA	EFF / ISO
LKB:				•
CHANNEL	1:	53 CPM	32.2 DPM	0.742 / I-125
CHANNEL	2: 1	98 CPM	709.2 DPM	0.065 / CR-51
BECKMAN:			t.	
CHANNEL	1:	52 CPM	22.1 DPM	1.075 / I-125
CHANNEL	2: 1	98 CPM	452.3 DPM	0.102 / CR-51

ATTACHMENT 2

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QUALITY ASSURANCE REPORT - BETA FOR DATE: 07/02/93

BECKMAN	L5000TD:	BKG	MDA	EFF / ISO
CHANNEL	1:	N/A	N/A	N/A
CHANNEL	2:	N/A	N/A	N/A
CHANNEL	3:	N/A	N/A	N/A

BECKMAN LS6800:

CHANNEL	1:	17 CPM	23.4 DPM	0.579/H-3
CHANNEL	2:	30 CPM	19.0 DPM	0.947/C-14
CHANNEL	3:	40 CPM	20.7 DPM	1.007/P-32

ATTACHMENT 3

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Key whist Decommissioning Survey

Fixed Gamma Contamination Survey-Office 12 Scale 1 inch = 4 feet



Conducted by: <u>SSG Koelker</u> on <u>07 Jul 93</u> II Measurements, in uR/hr Reviewed by on am ŧ.

Attachment 41 **

Key W'st Decommissioning Survey

Fixed Beta Contamination Survey-Office 12 Scale 1 inch = 4 feet



Reviewed by: Denald K frien on 10 aug 93

Attachment 5 ...

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KEY WEST DECOMMISSIONING SURVEY

Office - 13

REMOVABLE CONTAMINATION

Office Number 13 was surveyed for removable contamination on 2 Jul 93 by SPC Brinley. A total of 68 swipes were taken. See Attachment 1 for the location of each swipe.

The swipes were analyzed for gamma contamination, utilizing the Beckman Gammawell Counter on 3 Jul 93. See Attachment 2 for the MDAs and associated efficiencies. No gamma contamination was found above 200 dpm for I-125 or above 2000 dpm for any other isotope.

The swipes were analyzed for beta contamination, utilizing the Beckman Liquid Scintillation Counter Model 6800 on 3 Jul 93. See Attachment 3 for the MDAs and associated efficiencies. No beta contamination was found above 200 dpm for any isotope.

FIXED CONTAMINATION

A fixed gamma survey was conducted on 6 Jul 93 by SSG Koelker. The highest exposure rate found was 15.4 uR/hr. The average exposure rate was approximately 11 uR/hr. See Attachment 4 for the location of readings taken.

A fixed beta survey was conducted on 26 Jul 93 by SPC Brinley. The highest number of counts found during a one minute count-time was 72 cpm. The average number of counts found during a one minute count-time was 40 cpm. See Attachment 4 for the location of readings taken.

As well as being reviewed at the time of the survey/receipt of laboratory results, all pertinent survey data was reviewed and compiled here by SFC Green on 8 Aug 93.



Conducted by: <u>SPC Brinley</u> on 02 Jul 93 Lab analysis by (gamma): <u>SSG Koelker</u> on <u>03 Jul 93</u> (beta) : <u>SSG Koelker</u> on <u>03 Jul 93</u>

een on 10llurg 3 Reviewed by

Key W⁻ st Decommissioning Survey

Removable Contamination Survey-Office 13 Scale 1 inch = 4 feet



Conducted by: <u>SPC Brinley</u> on 02<u>' Jul 93</u> Lab analysis by (gamma): <u>SSG Koelker</u> on <u>03 Jul 93</u> (beta) : <u>SSG Koelker</u> on <u>03 Jul 93</u>

Reviewed by:

Attachment 1/ n.

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QUALITY ASSURANCE REPORT - GAMMA FOR DATE: 07/03/93

		BKG	MDA	EFF / ISO
LKB:				
CHANNEL :	1:	53 CPM	32.2 DPM	0.742 / I-125
CHANNEL	2: 1	L98 CPM	709.2 DPM	0.065 / CR-51
BECKMAN:				
CHANNEL	1:	52 CPM	22.1 DPM	1.075 / I-125
CHANNEL :	2: 1	198 CPM	452.3 DPM	0.102 / CR-51

ATTACHMENT 2

QUALITY ASSURANCE REPORT - BETA FOR DATE: 07/03/93

	BKG	MDA	EFF / ISO
BECKMAN L5000TD:			
CHANNEL 1:	N/A	N/A	N/A
CHANNEL 2:	N/A	N/A	N/A
CHANNEL 3:	N/A	N/A	N/A
BECKMAN LS6800:			
CHANNEL 1:	17 CPM	23.4 DPM	0.579/H-3
CHANNEL 2:	30 CPM	19.0 DPM	0.947/C-14
CHANNEL 3:	40 CPM	20.7 DPM	1.007/P-32

ATTACHMENT 3

Key V st Decommissioning Survey

Fixed Gamma Contamination Survey-Office 13 Scale 1 inch = 4 feet



Conducted by: SSG Koelker on 06 Jul 93 All Measurements in uR/hr een on 10 aug 93 Reviewed by:







Conducted by: <u>SPC Brinley</u> on <u>26 Jul 93</u> All Measurements are Gross Ope Minute Counts

Reviewed by Amala Kheen on 10 aug 93

Attachment 5'

KEY WEST DECOMMISSIONING SURVEY

Office - 14

REMOVABLE CONTAMINATION

Office Number 14 was surveyed for removable contamination on 29 Jun 93 by SSG Webster. A total of 44 swipes were taken. See Attachment 1 for the location of each swipe.

The swipes were analyzed for gamma contamination, utilizing the LKB Gammawell Counter on 29 Jun 93. See Attachment 2 for the MDAs and associated efficiencies. No gamma contamination was found above 200 dpm for I-125 or above 2000 dpm for any other isotope.

The swipes were analyzed for beta contamination, utilizing the Beckman Liquid Scintillation Counter Model 5000 on 29 Jun 93. See Attachment 3 for the MDAs and associated efficiencies. No beta contamination was found above 200 dpm for any isotope.

FIXED CONTAMINATION

A fixed gamma survey was conducted on 29 Jun 93 by SSG Webster. The highest exposure rate found was 12.0 uR/hr. The average exposure rate was approximately 8 uR/hr. See Attachment 4 for the location of readings taken.

A fixed beta survey was conducted on 26 Jul 93 by SPC Brinley. The highest number of counts found during a one minute count-time was 60 cpm. The average number of counts found during a one minute count-time was 30 cpm. See Attachment 5 for the location of readings taken.

As well as being reviewed at the time of the survey/receipt of laboratory results, all pertinent survey data was reviewed and compiled here by SFC Green on 8 Aug 93.

Removab. Contamination Survey-Office 14 Scale 1 inch = 4 feet



Conducted by: <u>SSG Webster</u> on 29 <u>Jun 93</u> Lab analysis by (gamma): <u>SSG Koelker</u> on <u>29 Jun 93</u> (beta) : <u>SSG Koelker</u> on <u>29 Jun 93</u>

Attachment 1

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on <u>///</u>

Reviewed by:

Key West Decommissioning Survey

Removable Contamination Survey-Office 14 Scale 1 inch = 4 feet



Conducted by: <u>SSG Webster</u> on 29 Jun 93 Lab analysis by (gamma): <u>SSG Koelker</u> on <u>29 Jun 93</u> (beta) : <u>SSG Koelker</u> on <u>29 Jun 93</u>

Reviewed by Mala Kacin on 10 aug 93

QUALITY ASSURANCE REPORT - GAMMA FOR DATE: 06/29/93

	BKG	MDA	EFF / ISO
LKB:			·
CHANNEL 1:	47 CPM	31.2 DPM	0.722 / I-125
CHANNEL 2:	199 CPM	802.1 DPM	0.058 / CR-51
BECKMAN:			
CHANNEL 1:	N/A	N/A	N/A
CHANNEL 2:	N/A	N/A	N/A

ATTACHMENT 2

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QUALITY ASSURANCE REPORT - BETA FOR DATE: 06/29/93

BECKMAN L5000TD:	BKG	MDA	EFF / ISO
CHANNEL 1:	32 CPM	29.4 DPM	0.633 / H-3
CHANNEL 2:	28 CPM	18.0 DPM	0.965 / C-14
CHANNEL 3:	26 CPM	N/A	N/A
BECKMAN LS6800:	· · · · · · · · · · · · · · · · · · ·		
CHANNEL 1:	N/A	N/A	N/A
CHANNEL 2:	N/A	N/A	N/A
CHANNEL 3:	N/A	N/A	N/A

ATTACHMENT 3

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Key V st Decommissioning Survey

Fixed Gamma Contamination Survey-Office 14 Scale 1 inch = 4 feet



Conducted by: SSG Webster on 29 Jul 93 All Measurements/in uR/hr on 101 .93 Reviewed by:

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Key V st Decommissioning Survey

Fixed Beta Contamination Survey-Office 14 Scale 1 inch = 4 feet



Attachment 5"

Office - 15

REMOVABLE CONTAMINATION

Office Number 15 was surveyed for removable contamination on 25 Jun 93 by SSG Webster. A total of 29 swipes were taken. See Attachment 1 for the location of each swipe.

The swipes were analyzed for gamma contamination, utilizing the LKB Gammawell Counter on 25 Jun 93. See Attachment 2 for the MDAs and associated efficiencies. No gamma contamination was found above 200 dpm for I-125 or above 2000 dpm for any other isotope.

The swipes were analyzed for beta contamination, utilizing the Beckman Liquid Scintillation Counter Model 5000 on 25 Jun 93. See Attachment 3 for the MDAs and associated efficiencies. No beta contamination was found above 200 dpm for any isotope.

FIXED CONTAMINATION

A fixed gamma survey was conducted on 25 Jun 93 by SSG Webster. The highest exposure rate found was 28.3 uR/hr. The average exposure rate was approximately 14 uR/hr. See Attachment 4 for the location of readings taken.

A fixed beta survey was conducted on 26 Jul 93 by SPC Brinley. The highest number of counts found during a one minute count-time was 63 cpm. The average number of counts found during a one minute count-time was 32 cpm. See Attachment 5 for the location of readings taken.

As well as being reviewed at the time of the survey/receipt of laboratory results, all pertinent survey data was reviewed and compiled here by SFC Green on 8 Aug 93.

Key West Decommissioning Survey





Conducted by: <u>SSG Webster</u> on <u>25 Jun 93</u> Lab analysis by (gamma): <u>SSG Koelker</u> on <u>25 Jun 93</u> (beta) : <u>SSG Koelker</u> on <u>25 Jun 93</u>

Reviewed by: / mald K Lucin

Attachment 1

on /L

QUALITY ASSURANCE REPORT - GAMMA FOR DATE: 06/25/93

	BKG	MDA	EFF / ISO
LKB:			-
CHANNEL 1:	45 CPM	30.1 DPM	0.733 / I-125
CHANNEL 2:	194 CPM	669.3 DPM	0.068 / CR-51
BECKMAN:		1 	
CHANNEL 1:	N/A	N/A	N/A
CHANNEL 2:	N/A	N/A	N/A

QUALITY ASSURANCE REPORT - BETA FOR DATE: 06/25/93

BECKMAN L5000TD:	BKG	MDA	EFF / ISO
CHANNEL 1:	21.0 CPM	23.8 DPM	0.627 / H-3
CHANNEL 2:	27.0 CPM	17.7 DPM	0.964 / C-14
CHANNEL 3:	36.0 CPM	N/A	N/A
BECKMAN LS6800:			
CHANNEL 1:	N/A	N/A	N/A
CHANNEL 2:	N/A	N/A	N/A
CHANNEL 3:	N/A	N/A	N/A

Key Wast Decommissioning Survey

Fixed Gamma Contamination Survey-Office 15 Scale 1 inch = 4 feet

1.0 130 +64-1-20.7 28.3 18.1 20. 22. 17.5 8.85 18.1 11.8 17.3 11.97 11.23 4.63 *4*. 14.2 23.0 99 8.02 Q.73 9.75 8.26 8.53 9 10.6 Z 1.3.8 73 10,4 20.9 12 6. 2 2.3 5. Icn 1.001 21.2 8-21 13.2 3 Conducted by: SSG Webster on 25 Jul 93 All Measurements/in uR/hr

Reviewed by Mala Colland on 100 Attachment 4

10.2

Key V'st Decommissioning Survey

Fixed Beta Contamination Survey-Office 15 Scale 1 inch = 4 feet



Conducted by: <u>SPC Brinley</u> on <u>26 Jul 93</u> All Measurements are Gross One Minute Counts

wer on 10 aug 93 Reviewed by

Attachment 5-

Office - 16

REMOVABLE CONTAMINATION

Office Number 16 was surveyed for removable contamination on 2 Jul 93 by SSG Webster. A total of 25 swipes were taken. See Attachment 1 for the location of each swipe.

The swipes were analyzed for gamma contamination, utilizing the LKB Gammawell Counter on 6 Jul 93. See Attachment 2 for the MDAs and associated efficiencies. No gamma contamination was found above 200 dpm for I-125 or above 2000 dpm for any other isotope.

The swipes were analyzed for beta contamination, utilizing the Beckman Liquid Scintillation Counter Model 6800 on 6 Jul 93. See Attachment 3 for the MDAs and associated efficiencies. No beta contamination was found above 200 dpm for any isotope.

FIXED CONTAMINATION

A fixed gamma survey was conducted on 2 Jul 93 by SSG Webster. The highest exposure rate found was 16.3 uR/hr. The average exposure rate was approximately 8 uR/hr. See Attachment 4 for the location of readings taken.

A fixed beta survey was conducted on 26 Jul 93 by SPC Brinley. The highest number of counts found during a one minute count-time was 36 cpm. The average number of counts found during a one minute count-time was 34 cpm. See Attachment 5 for the location of readings taken.

As well as being reviewed at the time of the survey/receipt of laboratory results, all pertinent survey data was reviewed and compiled here by SFC Green on 8 Aug 93.

Key West Decommissioning Survey

Removable Contamination Survey-Office 16 Scale 1 inch = 4 feet



Conducted by: <u>SSG Webster</u> on <u>02 Jul 93</u> Lab analysis by (gamma): <u>SSG Koelker</u> on <u>06 Jul 93</u> (beta) : <u>SSG Koelker</u> on <u>06 Jun 93</u>

on 10 aur 43 Reviewed by:

Attachment 1

QUALITY ASSURANCE REPORT - GAMMA FOR DATE: 07/06/93

		B	KG	MDZ	7	EFF	1	ISO
LKB:							·	
CHANNEL	1:	53	CPM	32.2	DPM	0.742	/	I-125
CHANNEL	2:	198 (СРМ	709.2	DPM	0.065	/	CR-51
BECKMAN:				۱ ۲۰۰۰				
CHANNEL	1:	52 (CPM	22.1	DPM	1.075	/	I-125
CHANNEL	2:	198	CPM	452.3	DPM	0.102	/	CR-51

ATTACHMENT 2

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QUALITY ASSURANCE REPORT - BETA FOR DATE: 07/06/93

DECTNAN		BKG	MDA	EFF / ISO
BECKMAN	<u>L50001D:</u>	·		
CHANNEL	1:	N/A	N/A	N/A
CHANNEL	2:	N/A	N/A	N/A
CHANNEL	3:	N/A	N/A	N/A
BECKMAN	L86800:			
CHANNEL	1:	39 CPM	36.4 DPM	0.561 / H-3
CHANNEL	2:	26 CPM	17.6 DPM	0.950 / C-14
CHANNEL	3:	24 CPM	16.1 DPM	1.002 / P-32

Key W A Decommissioning Survey





Attachment 4



Conducted by: <u>SPC Brinley</u> on <u>26 Jul 93</u> All Measurements are Gross One Minute Counts

100 on 10 Reviewed by:

Attachment 5

Conference Room

REMOVABLE CONTAMINATION

The Conference Room was surveyed for removable contamination on 19 Jul by SPC Brinley. A total of 63 swipes were taken. See Attachment 1 for the location of each swipe.

The swipes were analyzed for gamma contamination, utilizing the LKB Gammawell Counter on 19 Jul 93. See Attachment 2 for the MDAs and associated efficiencies. No gamma contamination was found above 200 dpm for I-125 or above 2000 dpm for any other isotope.

The swipes were analyzed for beta contamination, utilizing the Beckman Liquid Scintillation Counter Model 5000 on 19 Jul 93. See Attachment 3 for the MDAs and associated efficiencies. No beta contamination was found above 200 dpm for any isotope.

FIXED CONTAMINATION

Fixed gamma surveys were conducted on 19 Jul by SSG Webster. The highest exposure rate found was 27.6 uR/hr. See Attachment 4 for the location of readings taken.

A fixed beta survey was conducted on 26 Jul 93 by SPC Brinley. The highest number of counts found during a one minute count-time was 70 cpm. The average number of counts found during a one minute count-time was approximately 50 cpm. See Attachment 5 for the location of readings taken.

As well as being reviewed at the time of the survey/receipt of laboratory results, all pertinent survey data was reviewed and compiled here by SFC Green on 9 Aug 93.



QUALITY ASSURANCE REPORT - GAMMA FOR DATE: 07/19/93

	BKG	MDA	EFF / ISO
LKB:			
CHANNEL 1:	46 CPM	32.8 DPM	0.680 / I-125
CHANNEL 2:	194 CPM	724.5 DPM	0.063 / CR-51
BECKMAN:		•	
CHANNEL 1:	50 CPM	23.3 DPM	0.999 / I-125
CHANNEL 2:	198 CPM	393.6 DPM	0.118 / CR-51

ATTACHMENT 2

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QUALITY ASSURANCE REPORT - BETA FOR DATE: 07/19/93

		E	KG	MDZ	ł	EFF	1	ISO
BECKMAN	L5000TD:							
CHANNEL	1:	31	CPM	28.8	DPM	0.636	/	H-3
CHANNEL	2:	28	CPM	18.1	DPM	0.962	/	C-14
CHANNEL	3:	25	СРМ	16.5	DPM	1.004	/	P-32
BECKMAN	LS6800:							
CHANNEL	1:	33	СРМ	32.4	DPM	0.583	/	H-3
CHANNEL	2:	25	СРМ	17.2	DPM	0.954	1	C-14
CHANNEL	3:	21	CPM	14.9	DPM	1.011	1	P-32

ATTACHMENT 3

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Key W'st Decommissioning Survey

Fixed Gamma Contamination Survey-Conference Room Scale 1 inch = 4 feet

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K− 2'10" →													r	
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•	LL	<u>i</u>	1		<u>.</u>				<u> </u>			L		. •
	•			Cond	jucted t	y: <u>SSC</u>	Webst	er on <u>1</u>	9 Jul 93	<u>8</u> .				
		-	•	<pre></pre>		asurem	ents ar	e in uR	/hr	î.c.)			
		Re	evie	ewed by	(INA)	Attac	hment	on or	100	<u>ur 75</u>				







Reception Area

REMOVABLE CONTAMINATION

The Reception Area was surveyed for removable contamination on 17 Jul by SPC Brinley. A total of 56 swipes were taken. See Attachment 1 for the location of each swipe.

The swipes were analyzed for gamma contamination, utilizing the LKB Gammawell Counter on 17 Jul 93. See Attachment 2 for the MDAs and associated efficiencies. No gamma contamination was found above 200 dpm for I-125 or above 2000 dpm for any other isotope.

The swipes were analyzed for beta contamination, utilizing the Beckman Liquid Scintillation Counter Model 6800 on 17 Jul 93. See Attachment 3 for the MDAs and associated efficiencies. No beta contamination was found above 200 dpm for any isotope.

FIXED CONTAMINATION

Fixed gamma surveys were conducted on 17 Jul by SSG Webster. The highest exposure rate found was 23.0 uR/hr. See Attachment 4 for the location of readings taken.

A fixed beta survey was conducted on 26 Jul 93 by SPC Brinley. The highest number of counts found during a one minute count-time was 52 cpm. The average number of counts found during a one minute count-time was approximately 40 cpm. See Attachment 5 for the location of readings taken.

As well as being reviewed at the time of the survey/receipt of laboratory results, all pertinent survey data was reviewed and compiled here by SFC Green on 9 Aug 93.



Attachment 1

QUALITY ASSURANCE REPORT - GAMMA FOR DATE: 07/17/93

		B	KG	MDZ	Α	EFF	1	ISO
<u>LKB:</u>								
CHANNEL	1:	46	CPM	32.8	DPM	0.680	/	I -1 25
CHANNEL	2:	194	СРМ	724.5	DPM	0.063	/	CR-51
				٩			-	
BECKMAN								
CHANNEL	1:	50	CPM	23.3	DPM	0.999	/	I-125
CHANNEL	2:	198	CPM	393.6	DPM	0.118	/	CR-51

QUALITY ASSURANCE REPORT - BETA FOR DATE: <u>07/17/93</u>

		B	KG	MDZ	Υ	EFF	/	ISO
BECKMAN I	<u>L5000TD:</u>							
CHANNEL 1	1:	31	СРМ	28.8	DPM	0.636	1	H-3
CHANNEL 2	2:	28	СРМ	18.1	DPM	0.962	/	C-14
CHANNEL 3	3:	25	СРМ	16.5	DPM	1.004	1	P-32
BECKMAN 1	LS6800:					·		
CHANNEL :	1:	33	СРМ	32.4	DPM	0.583	1	H-3
CHANNEL 2	2:	25	CPM	17.2	DPM	0.954	/	C-14
CHANNEL :	3:	21	СРМ	14.9	DPM	1.011	/	P-32



Attachment 4



ROOM VENTS

REMOVABLE CONTAMINATION

On 19 JUL 93 the following room vents were surveyed by SFC Green. Rooms 31, 33, 35, 36, female and male latrines, and female and male changing rooms had 1 vent per room. Room 34 had 2 vents. 1 sample per vent was taken for a total of 10 samples.

The samples were analyzed for gamma contamination utilizing the LKB Gammawell Counter on 20 JUL 93. See Attachment 1 for the MDAs and associated efficiencies. No gamma contamination was found above 200 dpm for I-125 or above 2000 dpm for any other isotope.

The samples were analyzed for beta contamination, utilizing the Beckman Liquid Scintillation Counter Model 6800 on 20 JUL 93. See Attachment 2 for the MDAs and associated efficiencies. No beta contamination was found above 200 dpm for any isotope.

QUALITY ASSURANCE REPORT - GAMMA FOR DATE: 07/20/93

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·		BKG	MDA	EFF / ISO
LKB:				· · · · · · · · · · · · · · · · · · ·
CHANNEL	1:	46 CPM	32.8 DPM	0.680 / I-125
CHANNEL	2: 1	L94 CPM	724.5 DPM	0.063 / CR-51
BECKMAN:	· · ·		•	
CHANNEL	1:	50 CPM	23.3 DPM	0.999 / I-125
CHANNEL	2: 1	L98 CPM	393.6 DPM	0.118 / CR-51

QUALITY ASSURANCE REPORT - BETA FOR DATE:<u>07/20/93</u>

DECENAN		Ē	KG	MDZ	A	EFF	/	ISO
BECKMAN .	L5000TD:						•	
CHANNEL :	1:	31	CPM	28.8	DPM	0.636	/	H-3
CHANNEL 2	2:	28	CPM	18.1	DPM	0.962	/	C-14
CHANNEL 3	3:	25	CPM	16.5	DPM	1.004	/	P-32
BECKMAN	LS6800:							
CHANNEL :	1:	33	СРМ	32.4	DPM	0.583	1	H-3
CHANNEL :	2:	25	CPM	17.2	DPM	0.954	1	C-14
CHANNEL :	3:	21	CPM	14.9	DPM	1.011	1	P-32

ROOM VENTS

REMOVABLE CONTAMINATION

On 09 JUL 93 air vents in the following rooms were surveyed for removable contamination by SFC Green. Rooms 1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 12, 13, 14, 15, 16, 18, 20, 21, 22, 24, 28, 29, 30, 44, and 46 had 1 vent each and 1 sample per vent. Rooms 8, and 23 had 2 vents per room and 1 sample per vent were taken. The total number of samples is 29.

The samples were analyzed for gamma contamination, utilizing the LKB Gammawell Counter on 09 JUL 93. See Attachment 1 for the MDAs and associated efficiencies. No gamma contamination was found above 200 dpm for I-125 or above 2000 dpm for any other isotope.

The samples were analyzed for beta contamination, utilizing the Beckman Liquid Scintillation Counter Model 6800 on 09 JUL 93. See Attachment 2 for MDAs and associated efficiencies. No beta contamination was found above 200 dpm for any isotope.

QUALITY ASSURANCE REPORT - GAMMA FOR DATE: 07/09/93

		E	BKG	MD	A	EFF	1	ISO
LKB:						X	·	
CHANNEL	1:	55	CPM	36.9	DPM	0.660	/	I-125
CHANNEL	2:	204	СРМ	652.1	DPM	0.072	1	CR-51
BECKMAN:								
CHANNEL	1:	50	CPM	23.7	DPM	0.982	/	I-125
CHANNEL	2:	202	CPM	380.0	DPM	0.123	/	CR-51

ATTACHMENT 1

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QUALITY ASSURANCE REPORT ~ BETA FOR DATE: 07/09/93

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BECKMAN	L5000TD:	Ē	BKG	MDI	A	EFF	/	ISO
CHANNEL	1:	31	CPM	28.8	DPM	0.636	1	H-3
CHANNEL	2:	28	СРМ	18.1	DPM	0.962	1	C-14
CHANNEL	3:	25	CPM	16.5,	DPM	1.004	1	P-32
BECKMAN	LS6800:							
CHANNEL	1:	33	СРМ	32.4	DPM	0.583	/	H-3
CHANNEL	2:	25	СРМ	17.2	DPM	0.954	1	C-14
CHANNEL	3:	21	CPM	14.9	DPM	1.011	1	P-32

ATTACHMENT 2

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SINK AND SHOWER DRAINS

REMOVABLE CONTAMINATION

On 09 JUL 93 the following rooms with sinks were surveyed for removable contaimination from the sink drains by SSG Koelker. Rooms 9, 18, 19, 21, 23, and 24 for 1 sink per room. The female and male latrines for 2 sinks per room. The female and male changing rooms for 1 sink and 1 shower drain per room. There are 12 sink trap samples and 2 shower drain samples for a total of 14 samples taken this day.

The samples were analyzed for gamma contamination utilizing the LKB Gammawell Counter on 09 JUL 93. See attachment 1 for the MDAs and associated efficiencies. No gamma contamination was found above 200 dpm for I-125 or above 2000 dpm for any other isotope.

The samples were analyzed for beta contamination, utilizing the Beckman Liquid Scintillation Counter Model 6800 on 09 JUL 93. See attachment 2 for the MDAs and associated efficiencies. No beta contamination was found above 200 dpm for any isotope.

QUALITY ASSURANCE REPORT - GAMMA FOR DATE: 07/09/93

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	I	SKG	MDA	EFF	/ ISO
LKB:		• `x		·	•
CHANNEL 1	: 55	CPM 36	.9 DPM	0.660 /	I-125
CHANNEL 2	: 204	CPM 652	.1 DPM	0.072 /	CR-51
BECKMAN:					
CHANNEL 1	: 50	CPM 23	.7 DPM	0.982 /	I-125
CHANNEL 2	: 202	CPM 380	.0 DPM	0.123 /	CR-51

QUALITY ASSURANCE REPORT - BETA FOR DATE:<u>07/09/93</u>

BECKMAN L	5000TD:	B	KG	MDZ	A .	EFF	/	ISO
CHANNEL 1	: 3	31	СРМ	28.8	DPM	0.636	/	H-3
CHANNEL 2	: 2	28	CPM	18.1	DPM	0.962	/	C-14
CHANNEL 3	: 2	25	CPM	16.5	DPM	1.004	/	P-32
BECKMAN L	<u>S6800:</u>							
CHANNEL 1	: 3	33	СРМ	32.4	DPM	0.583	/	H-3
CHANNEL 2	: 2	25	CPM	17.2	DPM	0.954	/	C-14
CHANNEL 3	: 2	21	CPM	14.9	DPM	1.011	/	P-32

ATTACHMENT 2

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SINK DRAINS

REMOVABLE CONTAMINATION

On 19 JUL 93 SFC Green sampled the sink traps in the following rooms for removable contamination. Rooms 31, 33, 34, and 36 had 1 sink per room and 1 sample per drain was taken for a total of 4 samples.

The samples were analyzed for gamma contamination, utilizing the LKB Gammawell Counter on 20 JUL 93. See Attachment 1 for the MDAs and associated efficiencies. No gamma contamination was found above 200 dpm for I-125 or above 2000 dpm for any other isotope.

The samples were analyzed for beta contamination, utilizing the Beckman Liquid Scintillation Counter Model 6800 on 20 JUL 93. See Attachment 2 for the MDAs and associated efficiencies. No beta contamination was found above 200 dpm for any isotope.

QUALITY ASSURANCE REPORT - GAMMA FOR DATE: 07/20/93

		E	KG	MDZ	ł	EFF	/	' ISO
LKB:					• •		•	
CHANNEL	1:	46	CPM	32.8	DPM	0.680	1	I -1 25
CHANNEL	2:	194	CPM	724.5	DPM	0.063	1	CR-51
BECKMAN:		·		١				
CHANNEL	1:	50	СРМ	23.3	DPM	0.999	/	I-125
CHANNEL	2:	198	CPM	393.6	DPM	0.118	/	CR-51

ATTACHMENT 1

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QUALITY ASSURANCE REPORT - BETA FOR DATE: 07/20/93

BECKMAN L500	POTD:	KG	MDA	EFF	1	ISO
CHANNEL 1.	 ` 31	מיס	28.8 NPM	0.636	,	H-3
CHANNEL 21				0.060		- 1 A
CHANNEL Z:	20	CPM .	IO.I DPA	0.962		C-14
CHANNEL 3:	25	CPM .	16.5 DPM	1.004	/	P-32
BECKMAN LS68	300:					
CHANNEL 1:	33	CPM	32.4 DPM	0.583	/	H-3
CHANNEL 2:	25	CPM	17.2 DPM	0.954	/	C-14
CHANNEL 3:	21	СРМ	14.9 DPM	1.011	/	P-32

ATTACHMENT 2

KEY WEST DECOMMISSIONING SURVEY

Sharps/Electrical Closets

REMOVABLE CONTAMINATION

The sharps and electrical closets were surveyed for removable contamination on 29 Jun 93 by SPC Brinley. A total of 49 swipes were taken. See Attachment 1 for the location of each swipe.

The swipes were analyzed for gamma contamination, utilizing the LKB Gammawell Counter on 29 Jun 93. See Attachment 2 for the MDAs and associated efficiencies. No gamma contamination was found above 200 dpm for I-125 or above 2000 dpm for any other isotope.

The swipes were analyzed for beta contamination, utilizing the Beckman Liquid Scintillation Counter Model 5000 on 29 Jun 93. See Attachment 3 for the MDAs and associated efficiencies. No beta contamination was found above 200 dpm for any isotope.

FIXED CONTAMINATION

Fixed gamma surveys were conducted on 29 Jun 93 by SPC Brinley. The highest exposure rate found was 18.9 uR/hr. See Attachment 4 for the location of readings taken.

A fixed beta survey was conducted on 26 Jul 93 by SPC Brinley. The highest number of counts found during a one minute count-time was 70 cpm. The average number of counts found during a one minute count-time was approximately 45 cpm. See Attachment 5 for the location of readings taken.

As well as being reviewed at the time of the survey/receipt of laboratory results, all pertinent survey data was reviewed and compiled here by SFC Green on 9 Aug 93.

Removable Contamination Survey-Sharps/Electrical Closets Scale 1 inch = 4 feet



QUALITY ASSURANCE REPORT - GAMMA FOR DATE: 06/29/93

	BKG	MDA	EFF / ISO
LKB:			
CHANNEL 1:	47 CPM	31.2 DPM	0.722 / I-125
CHANNEL 2:	199 CPM	802.1 DPM	0.058 / CR-51
BECKMAN:		1 	· · · · ·
CHANNEL 1:	N/A	N/A	N/A
CHANNEL 2:	N/A	N/A	N/A

ATTACHMENT 2

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QUALITY ASSURANCE REPORT - BETA FOR DATE: 06/29/93

	BKG	MDA	EFF / ISO
BECKMAN L5000TD:			
CHANNEL 1:	32 CPM	29.4 DPM	0.633 / H-3
CHANNEL 2:	28 CPM	18.0 DPM	0.965 / C-14
CHANNEL 3:	26 CPM	N/A	N/A
BECKMAN LS6800:			· · · · · ·
CHANNEL 1:	N/A	N/A	N/A
CHANNEL 2:	N/A	N/A	N/A
CHANNEL 3:	N/A	N/A	N/A

ATTACHMENT 3

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Key V' st Decommissioning Survey





Attachment 4



Attachment 5

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KEY WEST DECOMMISSIONING SURVEY

Female Changing Room & elevator

REMOVABLE CONTAMINATION

The female changing room and elevator were surveyed for removable contamination on 14 Jul by SPC Brinley. A total of 100 swipes were taken. See Attachment 1 for the location of each swipe.

The swipes were analyzed for gamma contamination, utilizing the LKB Gammawell Counter on 14 Jul 93. See Attachment 2 for the MDAs and associated efficiencies. No gamma contamination was found above 200 dpm for I-125 or above 2000 dpm for any other isotope.

The swipes were analyzed for beta contamination, utilizing the Beckman Liquid Scintillation Counter Model 5000 on 14 Jul 93. See Attachment 3 for the MDAs and associated efficiencies. No beta contamination was found above 200 dpm for any isotope.

FIXED CONTAMINATION

Fixed gamma surveys were conducted on 14 Jul by SPC Brinley. The highest exposure rate found was 14.6 uR/hr. See Attachment 4 for the location of readings taken.

A fixed beta survey was conducted on 26 Jul 93 by SPC Brinley. The highest number of counts found during a one minute count-time was 115 cpm. The average number of counts found during a one minute count-time was approximately 80 cpm. See Attachment 5 for the location of readings taken.

As well as being reviewed at the time of the survey/receipt of laboratory results, all pertinent survey data was reviewed and compiled here by SFC Green on 9 Aug 93.

Key V'st Decommissioning Survey

Removable Contamination Survey- Female Changing Room Scale 1 inch = 4 feet



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Conducted by: SPC Brinley on 14 Jun 93 Lab analysis by (gamma): SSG Koelker on 14 Jun 93 (beta): SSG Koelker on 14 Jun 93 Reviewed by .on //

QUALITY ASSURANCE REPORT - GAMMA FOR DATE: 07/14/93

	BKG	MDA	EFF	/ ISO
LKB:				
CHANNEL 1:	49 CPM	30.1 D	PM 0.764	/ I-125
CHANNEL 2:	197 CPM	676.4 D	PM 0.068	/ CR-51
BECKMAN:		ι.		
CHANNEL 1:	46 CPM	23.0 D	PM 0.970	/ I-125
CHANNEL 2:	194 CPM	440.0 D	PM 0.104	/ CR-51

ATTACHMENT 2

QUALITY ASSURANCE REPORT - BETA FOR DATE: 07/14/93

:		В	KG	MDZ	A	EFF	1	ISO
BECKMAN	L5000TD:							
CHANNEL	1:	31	CPM	28.8	DPM	0.636	/	H-3
CHANNEL	2:	28	CPM	18.1	DPM	0.962	/	C-14
CHANNEL	3:	25	СРМ	16.5	DPM	1.004	/	P-32
BECKMAN	LS6800:							
CHANNEL	1:	33	CPM	32.4	DPM	0.583	/	H-3
CHANNEL	2:	25	CPM	17.2	DPM	0.954	1	C-14
CHANNEL	3:	21	СРМ	14.9	DPM	1.011	/	P-32

ATTACHMENT 3

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Key V'nst Decommissioning Survey





Key W t Decommissioning Survey





KEY WEST DECOMMISSIONING SURVEY

Male Changing Room & Closets

REMOVABLE CONTAMINATION

The Male changing room and closets were surveyed for removable contamination on 14 Jul by SPC Brinley. A total of 115 swipes were taken. See Attachment 1 for the location of each swipe.

The swipes were analyzed for gamma contamination, utilizing the Beckman Gammawell Counter on 14 Jul 93. See Attachment 2 for the MDAs and associated efficiencies. No gamma contamination was found above 200 dpm for I-125 or above 2000 dpm for any other isotope.

The swipes were analyzed for beta contamination, utilizing the Beckman Liquid Scintillation Counter Model 5000 on 14 Jul 93. See Attachment 3 for the MDAs and associated efficiencies. No beta contamination was found above 200 dpm for any isotope.

FIXED CONTAMINATION

Fixed gamma surveys were conducted on 14 Jul by SPC Brinley. The highest exposure rate found was 21.5 uR/hr. See Attachment 4 for the location of readings taken.

A fixed beta survey was conducted on 26 Jul 93 by SPC Brinley. The highest number of counts found during a one minute count-time was 79 cpm. The average number of counts found during a one minute count-time was approximately 48 cpm. See Attachment 5 for the location of readings taken.

As well as being reviewed at the time of the survey/receipt of laboratory results, all pertinent survey data was reviewed and compiled here by SFC Green on 9 Aug 93.



Key V st Decommissioning Survey





Conducted by: <u>SPC Brinley</u> on <u>14 Jun 93</u> Lab analysis by (gamma): <u>SSG Koelker</u> on <u>14 Jun 93</u> (beta) : <u>SSG Koelker</u> on <u>14 Jun 93</u>

Reviewed by: 7 _on /0

QUALITY ASSURANCE REPORT - GAMMA FOR DATE: 07/14/93

	BKG	MDA	EFF / ISO
LKB:			· · ·
CHANNEL 1:	49 CPM	30.1 DPM	0.764 / I-125
CHANNEL 2:	197 CPM	676.4 DPM	0.068 / CR-51
BECKMAN:		۱	
CHANNEL 1:	46 CPM	23.0 DPM	0.970 / I-125
CHANNEL 2:	194 CPM	440.0 DPM	0.104 / CR-51

ATTACHMENT 2

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QUALITY ASSURANCE REPORT - BETA FOR DATE: 07/14/93

DECENAN		E	BKG	MDZ	ł	EFF	/	ISO
BECKMAN I	<u>13000TD:</u>							
CHANNEL 1	1:	31	CPM	28.8	DPM	0.636	/	H-3
CHANNEL 2	2:	28	СРМ	18.1	DPM	0.962	/	C-14
CHANNEL 3	3:	25	CPM	16.5	DPM	1.004	1	P-32
BECKMAN I	LS6800:							
CHANNEL 1	1:	33	СРМ	32.4	DPM	0.583	/	H-3
CHANNEL 2	2:	25	СРМ	17.2	DPM	0.954	Ì	C-14
CHANNEL 3	3:	21	CPM	14.9	DPM	1.011	1	P-32

ATTACHMENT 3

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Key V t Decommissioning Survey



KEY WEST DECOMMISSIONING SURVEY

Female Restroom

REMOVABLE CONTAMINATION

The female restroom was surveyed for removable contamination on 6 Jul 93 by SSG Koelker. A total of 27 swipes were taken. See Attachment 1 for the location of each swipe.

The swipes were analyzed for gamma contamination, utilizing the LKB Gammawell Counter on 6 Jul 93. See Attachment 2 for the MDAs and associated efficiencies. No gamma contamination was found above 200 dpm for I-125 or above 2000 dpm for any other isotope.

The swipes were analyzed for beta contamination, utilizing the Beckman Liquid Scintillation Counter Model 5000 on 6 Jul 93. See Attachment 3 for the MDAs and associated efficiencies. No beta contamination was found above 200 dpm for any isotope.

FIXED CONTAMINATION

Fixed gamma surveys were conducted on 6 Jul 93 by SSG Koelker. The highest exposure rate found was 22.7 uR/hr. See Attachment 4 for the location of readings taken.

A fixed beta survey was conducted on 26 Jul 93 by SPC Brinley. The highest number of counts found during a one minute count-time was 53 cpm. The average number of counts found during a one minute count-time was approximately 34 cpm. See Attachment 5 for the location of readings taken.

As well as being reviewed at the time of the survey/receipt of laboratory results, all pertinent survey data was reviewed and compiled here by SFC Green on 9 Aug 93.

Key West Decommissioning Survey

Removable Contamination Survey-Female Restroom Scale 1 inch = 4 feet



QUALITY ASSURANCE REPORT - GAMMA FOR DATE: 07/06/93

	BKG	MDA	EFF / ISO
LKB:			
CHANNEL 1:	53 CPM	32.2 DPM	0.742 / I-125
CHANNEL 2:	198 CPM	709.2 DPM	0.065 / CR-51
			-
BECKMAN:			
CHANNEL 1:	52 CPM	22.1 DPM	1.075 / I-125
CHANNEL 2:	198 CPM	452.3 DPM	0.102 / CR-51

ATTACHMENT 2

QUALITY ASSURANCE REPORT - BETA FOR DATE: 07/06/93

DECEMAN LEGGORD.	BKG	MDA	EFF / ISO
BECKMAN ISOUUID.		•	
CHANNEL 1:	32 CPM	29.4 DPM	0.633 / H-3
CHANNEL 2:	28 CPM	18.0 DPM	0.965 / C-14
CHANNEL 3:	26 CPM	N/A	N/A
BECKMAN LS6800:	•		л ^а
CHANNEL 1:	N/A	N/A	N/A
CHANNEL 2:	N/A	N/A	N/A
CHANNEL 3:	N/A	N/A	N/A
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ATTACHMENT 3

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Key! st Decommissioning Survey

Fixed Gamma Contamination Survey-Female Restroom Scale 1 inch = 4 feet

Conducted by: <u>SSG Koelker</u> on <u>06 Jul 93</u> All Measurements are in uR/hr Reviewed by: <u>Mala</u> Man on <u>10 (Jup 73</u>)

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Key V it Decommissioning Survey

Fixed Beta Contamination Survey-Female Restroom Scale 1 inch = 4 feet



Conducted by: <u>SPC Brinley</u> on <u>26 Jul 93</u> All Measurements are Gross Courits in One Minute

1 on 100 Reviewed by:

KEY WEST DECOMMISSIONING SURVEY

Male Restroom

REMOVABLE CONTAMINATION

The male restroom was surveyed for removable contamination on 30 Jun 93 by SPC Brinley. A total of 31 swipes were taken. See Attachment 1 for the location of each swipe.

The swipes were analyzed for gamma contamination, utilizing the LKB Gammawell Counter on 6 Jul 93. See Attachment 2 for the MDAs and associated efficiencies. No gamma contamination was found above 200 dpm for I-125 or above 2000 dpm for any other isotope.

The swipes were analyzed for beta contamination, utilizing the Beckman Liquid Scintillation Counter Model 5000 on 6 Jul 93. See Attachment 3 for the MDAs and associated efficiencies. No beta contamination was found above 200 dpm for any isotope.

FIXED CONTAMINATION

Fixed gamma surveys were conducted on 6 Jul 93 by SPC Brinley. The highest exposure rate found was 16.5 uR/hr. See Attachment 4 for the location of readings taken.

A fixed beta survey was conducted on 26 Jul 93 by SPC Brinley. The highest number of counts found during a one minute count-time was 52 cpm. The average number of counts found during a one minute count-time was approximately 30 cpm. See Attachment 5 for the location of readings taken.

As well as being reviewed at the time of the survey/receipt of laboratory results, all pertinent survey data was reviewed and compiled here by SFC Green on 9 Aug 93.



Conducted by: <u>SPC Brinley on 30 Jun 93</u> Lab analysis by (gamma): <u>SSG Koelker</u> on <u>06 Jul 93</u> (beta) : <u>SSG Koelker</u> on <u>06 Jul 93</u> Reviewed by: <u>Mild</u> <u>Meen</u> on <u>10 (ur 9</u>)?

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QUALITY ASSURANCE REPORT - GAMMA FOR DATE: 07/06/93

		В	KG	MD	A	EFF		/ ISO
LKB:							•	
CHANNEL	1:	53	СРМ	32.2	DPM	0.742	/	I-125
CHANNEL	2:	198	CPM	709.2	DPM	0.065	1	CR-51
BECKMAN:				ſ				
CHANNEL	1:	52	СРМ	22.1	DPM	1.075	1	I-125
CHANNEL	2:	198	CPM	452.3	DPM	0.102	/	CR-51

ATTACHMENT 2

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QUALITY ASSURANCE REPORT - BETA FOR DATE: 07/06/93

BECKMAN L5000TD:	BKG	MDA	EFF / ISO
CHANNEL 1:	32 CPM	29.4 DPM	0.633 / H-3
CHANNEL 2:	28 CPM	18.0 DPM	0.965 / C-14
CHANNEL 3:	26 CPM	N/A	N/A
BECKMAN LS6800:			
CHANNEL 1:	N/A	N/A	N/A
CHANNEL 2:	N/A	N/A	N/A
CHANNEL 3:	N/A	N/A	N/A

ATTACHMENT 3

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Key Vost Decommissioning Survey

Fixed Gamma Contamination Survey-Male Restroom Scale 1 inch = 4 feet



Key' st Decommissioning Survey





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KEY WEST DECOMMISSIONING SURVEY

Hallway - 1

REMOVABLE CONTAMINATION

Hallway Number 1 was surveyed for removable contamination on 6 Jul 93 by SPC Brinley. A total of 68 swipes were taken. See Attachment 1 for the location of each swipe.

The swipes were analyzed for gamma contamination, utilizing the LKB Gammawell Counter on 6 Jul 93. See Attachment 2 for the MDAs and associated efficiencies. No gamma contamination was found above 200 dpm for I-125 or above 2000 dpm for any other isotope.

The swipes were analyzed for beta contamination, utilizing the Beckman Liquid Scintillation Counter Model 5000 on 6 Jul 93. See Attachment 3 for the MDAs and associated efficiencies. No beta contamination was found above 200 dpm for any isotope.

FIXED CONTAMINATION

A fixed gamma survey was conducted on 6 Jul 93 by SPC Brinley. The highest exposure rate found was 19.3 uR/hr. The average exposure rate was approximately 18 uR/hr. See Attachment 4 for the location of readings taken.

A fixed beta survey was conducted on 26 Jul 93 by SPC Brinley. The highest number of counts found during a one minute count-time was 73 cpm. The average number of counts found during a one minute count-time was 45 cpm. See Attachment 5 for the location of readings taken.

As well as being reviewed at the time of the survey/receipt of laboratory results, all pertinent survey data was reviewed and compiled here by SFC Green on 8 Aug 93.



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QUALITY ASSURANCE REPORT - GAMMA FOR DATE: 07/06/93

	BKG	MDA	EFF	/ ISO
LKB:				· ·
CHANNEL 1:	53 CPM	I 32.2 I	DPM 0.742	/ I-125
CHANNEL 2:	198 CPM	I 709.2 I	DPM 0.065	/ CR-51
		· · · · · · · · · · · · · · · · · · ·		-
BECKMAN:				
CHANNEL 1:	52 CPM	1 22.1 1	DPM 1.075	/ I-125
CHANNEL 2:	198 CPM	I 452.3 I	DPM 0.102	/ CR-51

ATTACHMENT 2

QUALITY ASSURANCE REPORT - BETA FOR DATE: 07/06/93

BECKMAN L5000TD:	BKG	MDA	EFF / ISO
CHANNEL 1:	32 CPM	29.4 DPM	0.633 / H-3
CHANNEL 2:	28 CPM	18.0 DPM	0.965 / C-14
CHANNEL 3:	26 CPM	N/A	N/A
BECKMAN LS6800:			
CHANNEL 1:	N/A	N/A	N/A
CHANNEL 2:	N/A	N/A	N/A
CHANNEL 3:	N/A	N/A	N/A

ATTACHMENT 3

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Key V it Decommissioning Survey

Fixed Beta Contamination Survey-Hallway 1 Scale I inch = 4 feet

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Conducted by: <u>SPC Brinley</u> on <u>26 Jul 93</u> All Measurements are Gross Counts in One Minute

Reviewed by:

Attachment 5

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KEY WEST DECOMMISSIONING SURVEY

Hallway - 2

REMOVABLE CONTAMINATION

Hallway Number 2 was surveyed for removable contamination on 3 Jul 93 (South end) and 14 Jul 93 (North end) by SPC Brinley. A total of 125 (63 and 62 respectively) swipes were taken. See Attachment 1 for the location of each swipe.

The swipes were analyzed for gamma contamination, utilizing the LKB Gammawell Counter on 2 Jul and 14 Jul 93. See Attachment 2 for the MDAs and associated efficiencies. No gamma contamination was found above 200 dpm for I-125 or above 2000 dpm for any other isotope.

The swipes were analyzed for beta contamination, utilizing the Beckman Liquid Scintillation Counter Model 5000 on 2 and 14 Jul 93. See Attachment 3 for the MDAs and associated efficiencies. No beta contamination was found above 200 dpm for any isotope.

FIXED CONTAMINATION

A fixed gamma survey was conducted on 2 Jul 93 by SPC Brinley and on 14 Jul 93 by SSG Webster. The highest exposure rate found was 26.1 uR/hr. The average exposure rate was approximately 18 uR/hr. See Attachment 4 for the location of readings taken.

A fixed beta survey was conducted on 26 Jul 93 by SPC Brinley. The highest number of counts found during a one minute count-time was 81 cpm. The average number of counts found during a one minute count-time was 50 cpm. See Attachment 5 for the location of readings taken.

As well as being reviewed at the time of the survey/receipt of laboratory results, all pertinent survey data was reviewed and compiled here by SFC Green on 9 Aug 93.

Key st Decommissioning Survey

Removable Contamination Survey-Hallway 2 Scale 1 inch = 4 feet



Conducted by: <u>SPC Brinley</u> on <u>02 Jul 93</u> and <u>14 Jul 93</u> Lab analysis by (gamma): <u>SSG Koelker</u> on <u>03 Jul 93</u> (beta) : <u>SSG Koelker</u> on <u>03 Jul 93</u> Reviewed by: <u>Mult</u> <u>Juban</u> on <u>10 Jul 93</u>

Key est Decommissioning Survey

Removable Contanination Survey-Hallway 2 Scale 1 inch = 4 feet



QUALITY ASSURANCE REPORT - GAMMA FOR DATE: 07/02/93

	BKG	MDA	EFF / ISO
LKB:			
CHANNEL 1:	53 CPM	32.2 DPM	0.742 / I-125
CHANNEL 2:	198 CPM	709.2 DPM	0.065 / CR-51
BECKMAN:		ч	
CHANNEL 1:	52 CPM	22.1 DPM	1.075 / I-125
CHANNEL 2:	198 CPM	452.3 DPM	0.102 / CR-51

ATTACHMENT 2

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QUALITY ASSURANCE REPORT - GAMMA FOR DATE: 07/14/93

	BKG	MDA	EFF / ISO
LKB:			1 -
CHANNEL 1:	49 CPM	30.1 DPM	0.764 / I-125
CHANNEL 2:	197 CPM	676.4 DPM	0.068 / CR-51
BECKMAN:		(· · · · · ·
CHANNEL 1:	46 CPM	23.0 DPM	0.970 / I-125
CHANNEL 2:	194 CPM	440.0 DPM	0.104 / CR-51

ATTACHMENT 2

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QUALITY ASSURANCE REPORT - BETA FOR DATE: 07/02/93

BECKMAN	L5000TD:	BKG	MDA	EFF / ISO
CHANNEL	1:	32 CPM	29.4 DPM	0.633 / H-3
CHANNEL :	2:	28 CPM	18.0 DPM	0.965 / C-14
CHANNEL	3:	26 CPM	N/A	N/A
BECKMAN	LS6800:			
CHANNEL	1:	N/A	N/A	N/A
CHANNEL :	2:	N/A	N/A	N/A
CHANNEL :	3:	N/A	N/A	N/A

ATTACHMENT 3

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QUALITY ASSURANCE REPORT - BETA For date:<u>07/14/93</u>

BECKMAN	L5000TD:	E	KG	MDZ	A	EFF	/	ISO
CHANNEL	1:	31	CPM	28.8	DPM	0.636	/	H-3
CHANNEL	2:	28	СРМ	18.1	DPM	0.962	/	C-14
CHANNEL	3:	25	СРМ	16.5	DPM	1.004	/	P-32
BECKMAN	LS6800:							
CHANNEL	1:	33	СРМ	32.4	DPM	0.583	/	H-3
CHANNEL	2:	25	СРМ	17.2	DPM	0.954	/	C-14
CHANNEL	3:	21	CPM	14.9	DPM	1.011	/	P-32

ATTACHMENT 3

Ke West Decommissioning Survey





Key /est Decommissioning Survey

Fixed Gamma Contamination Survey-Hallway 2 Scale 1 inch = 4 feet



Key Jest Decommissioning Survey

Fixed Beta Contamination Survey-Hallway 2 Scale 1 inch = 4 feet



Kev Vest Decommissioning Survey



KEY WEST DECOMMISSIONING SURVEY

Hallway - 3

REMOVABLE CONTAMINATION

Hallway Number 3 was surveyed for removable contamination on 21 Jun 93 by SPC Brinley. A total of 130 swipes were taken. See Attachment 1 for the location of each swipe.

The swipes were analyzed for gamma contamination, utilizing the LKB Gammawell Counter on 21 Jun 93. See Attachment 2 for the MDAs and associated efficiencies. No gamma contamination was found above 200 dpm for I-125 or above 2000 dpm for any other isotope.

The swipes were analyzed for beta contamination, utilizing the Beckman Liquid Scintillation Counter Model 5000 on 21 Jun 93. See Attachment 3 for the MDAs and associated efficiencies. No beta contamination was found above 200 dpm for any isotope.

FIXED CONTAMINATION

A fixed gamma survey was conducted on 21 Jun 93 by SPC Brinley. The highest exposure rate found was 23.9 uR/hr. See Attachment 4 for the location of readings taken.

A fixed beta survey was conducted on 26 Jul 93 by SPC Brinley. The highest number of counts found during a one minute count-time was 70 cpm. The average number of counts found during a one minute count-time was 30 cpm. See Attachment 5 for the location of readings taken.

As well as being reviewed at the time of the survey/receipt of laboratory results, all pertinent survey data was reviewed and compiled here by SFC Green on 9 Aug 93.

Removable Contamination Survey-Hallway 3 Scale 1 inch = 8 feet



Conducted by: <u>SPC Brinley</u> on <u>21 Jun 93</u> Lab analysis by (gamma): <u>SSG Koelker</u> on <u>21 Jun 93</u> (beta) : <u>SSG Koelker</u> on <u>21 Jun 93</u> Reviewed by: <u>Mala Kommon</u> <u>10 Aug 93</u>

QUALITY ASSURANCE REPORT - GAMMA FOR DATE: 06/21/93

	BKG	MDA	EFF / ISO
LKB:			· · · · · · · · ·
CHANNEL 1:	53 CPM	32.2 DPM	0.742 / I-125
CHANNEL 2:	198 CPM	709.2 DPM	0.065 / CR-51
BECKMAN:			· • •
CHANNEL 1:	52 CPM	22.1 DPM	1.075 / I-125
CHANNEL 2:	198 CPM	452.3 DPM	0.102 / CR-51

ATTACHMENT 2

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QUALITY ASSURANCE REPORT - BETA FOR DATE: 06/21/93

BECKMAN L	5000TD:	SKG M	DA EFF	/ ISO
CHANNEL 1	: 32	CPM 29.	4 DPM 0.633	/ H-3
CHANNEL 2	: 28	CPM 18.	0 DPM 0.965	/ C-14
CHANNEL 3	: 26	СРМ	N/A	N/A
BECKMAN L	<u>56800:</u>			
CHANNEL 1	: 1	I/A	N/A	N/A
CHANNEL 2	: 1	1/A	N/A	N/A
CHANNEL 3	:]	1/A	N/A	N/A

ATTACHMENT 3

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Key ¹⁴ est Decommissioning Survey

Fixed Gamma Contamination Survey-Hallway 3 Scale 1 inch = 8 feet



Conducted by: SPC Brinley on 21 Jun 93 All Measurements are in uR/hr on 10 aug 2

Attachment 4

Reviewed by

Key "'lest Decommissioning Survey

Fixed Beta Contamination Survey-Hailway 3 Scale 1 inch = 8 feet



Conducted by: <u>SPC Brinley</u> on <u>26 Jul 93</u> All Measurements are Gross Counts in One Minute

un 10 All 93 Reviewed by:

KEY WEST DECOMMISSIONING SURVEY

Hallway - 4

REMOVABLE CONTAMINATION

Hallway Number 4 was surveyed for removable contamination on 19 Jul 93 by SFC Green. A total of 84 swipes were taken. See Attachment 1 for the location of each swipe.

The swipes were analyzed for gamma contamination, utilizing the LKB Gammawell Counter on 19 Jul 93. See Attachment 2 for the MDAs and associated efficiencies. No gamma contamination was found above 200 dpm for I-125 or above 2000 dpm for any other isotope.

The swipes were analyzed for beta contamination, utilizing the Beckman Liquid Scintillation Counter Model 5000 on 19 Jul 93. See Attachment 3 for the MDAs and associated efficiencies. No beta contamination was found above 200 dpm for any isotope.

FIXED CONTAMINATION

A fixed gamma survey was conducted on 19 Jul 93 by SPC Brinley. The highest exposure rate found was 29.4 uR/hr. See Attachment 4 for the location of readings taken.

A fixed beta survey was conducted on 26 Jul 93 by SPC Brinley. The highest number of counts found during a one minute count-time was 71 cpm. The average number of counts found during a one minute count-time was 40 cpm. See Attachment 5 for the location of readings taken.

As well as being reviewed at the time of the survey/receipt of laboratory results, all pertinent survey data was reviewed and compiled here by SFC Green on 9 Aug 93.

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Removable Contamination Survey-Hallway 4

Conducted by: SPC Brinley on 19 Jul 93 Lab analysis by (gamma): SSG Koelker on 19 Jul 93 (beta): SSG Koelker on 19 Jul 93

Reviewed by:

Attachment 1

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QUALITY ASSURANCE REPORT - GAMMA FOR DATE: 07/19/93

	1	BKG	MDA	EFF / ISO
<u>LKB:</u>				·
CHANNEL 1	L: 46	СРМ	32.8 DPM	0.680 / I-125
CHANNEL 2	2: 194	СРМ	724.5 DPM	0.063 / CR-51
BECKMAN:			,	• •
CHANNEL 1	L: 50	CPM	23.3 DPM	0.999 / I-125
CHANNEL 2	2: 198	CPM 3	393.6 DPM	0.118 / CR-51

ATTACHMENT 2

QUALITY ASSURANCE REPORT - BETA FOR DATE: 07/19/93

BECKMAN	L5000TD:	E	SKG	MDZ	A	EFF	/	ISO
CHANNEL.	1.	31	СЪМ	28.8	אַסַת	0.636	,	H-3
				10.1	DDV	0.050	,	
CHANNEL	2:	28	CPM	10.1	DPM	0.962	/	C-14
CHANNEL	3:	25	СРМ	16.5	DPM	1.004	/	P-32
BECKMAN	<u>LS6800:</u>							
CHANNEL	1:	33	CPM	32.4	DPM	0.583	/	H-3
CHANNEL	2:	25	CPM	17.2	DPM	0.954	/	C-14
CHANNEL	3:	21	СРМ	14.9	DPM	1.011	/	P-32

ATTACHMENT 3

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Key St Decommissioning Survey





Conducted by: <u>SPC Brinley</u> on <u>19 Jul 93</u> All Measurements are in uR/hr Reviewed by: <u>Mala Klass</u> on <u>10 Que 9.3</u>

Key V st Decommissioning Survey

Fixed Beta Contamination Survey-Hallway 4 Scale 1 inch = 4 feet



Conducted by: <u>SPC Brinley</u> on <u>26 Jul 93</u> All Measurements are Gross Counts in One Minute

- on <u>70 Auc 93</u> Reviewed by;

KEY WEST DECOMMISSIONING SURVEY

Hallway - 5

REMOVABLE CONTAMINATION

Hallway Number 5 was surveyed for removable contamination on 16 Jul 93 by SPC Brinley. A total of 120 swipes were taken. See Attachment 1 for the location of each swipe.

The swipes were analyzed for gamma contamination, utilizing the LKB Gammawell Counter on 16 Jul 93. See Attachment 2 for the MDAs and associated efficiencies. No gamma contamination was found above 200 dpm for I-125 or above 2000 dpm for any other isotope.

The swipes were analyzed for beta contamination, utilizing the Beckman Liquid Scintillation Counter Model 6800 on 16 Jul 93. See Attachment 3 for the MDAs and associated efficiencies. No beta contamination was found above 200 dpm for any isotope.

FIXED CONTAMINATION

A fixed gamma survey was conducted on 16 Jul 93 by SPC Brinley. The highest exposure rate found was 19.2 uR/hr. See Attachment 4 for the location of readings taken.

A fixed beta survey was conducted on 26 Jul 93 by SPC Brinley. The highest number of counts found during a one minute count-time was 94 cpm. The average number of counts found during a one minute count-time was 45 cpm. See Attachment 5 for the location of readings taken.

As well as being reviewed at the time of the survey/receipt of laboratory results, all pertinent survey data was reviewed and compiled here by SFC Green on 9 Aug 93.

Rey west Decommissioning Survey



Lab analysis by (gamma): <u>SSG Koelker</u> on <u>16 Jul 93</u> (beta): <u>SSG Koelker</u> on <u>16 Jul 93</u>

Reviewed by: Mala Khilen on 10 aug 93

QUALITY ASSURANCE REPORT - GAMMA FOR DATE: 07/16/93

	BKG	MDA	EFF / ISO
LKB:		·	
CHANNEL 1:	46 CPM	32.8 DPM	0.680 / I-125
CHANNEL 2:	194 CPM	724.5 DPM	0.063 / CR-51
BECKMAN:		· т	
CHANNEL 1:	50 CPM	23.3 DPM	0.999 / I-125
CHANNEL 2:	198 CPM	393.6 DPM	0.118 / CR-51

ATTACHMENT 2

QUALITY ASSURANCE REPORT - BETA FOR DATE: 07/16/93

		B	KG	MDZ	A	EFF	1	ISO
BECKMAN	L5000TD:							
CHANNEL	1:	31	CPM	28.8	DPM	0.636	1	H-3
CHANNEL	2:	28	CPM	18.1	DPM	0.962	/	C-14
CHANNEL	3:	25	СРМ	16.5	DPM	1.004	/	P-32
BECKMAN	LS6800:							
CHANNEL	1:	33	CPM	32.4	DPM	0.583	1	H-3
CHANNEL	2:	25	CPM	17.2	DPM	0.954	1	C-14
CHANNEL	3:	21	СРМ	14.9	DPM	1.011	1	P-32

ATTACHMENT 3

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Key ***est Decommissioning Survey

Fixed Gamma Contamination Survey-Hallway 5 Scale 1 inch = 6.6 feet



Conducted by: SPC Brinley on 16 Jul 93 All Measurements are, in uR/hr on 10Aug 93 Reviewed by: .1 Attachment 4

Key ''est Decommissioning Survey

Fixed Beta Contamination Survey-Hallway 5 Scale 1 inch = 6.6 feet



Conducted by: <u>SPC Brinley</u> on <u>26 Jul 93</u> All Measurements are Gross Counts in One Minute

Attachment 5

Reviewed by:

KEY WEST DECOMMISSIONING SURVEY

Hallway - 6

REMOVABLE CONTAMINATION

Hallway Number 6 was surveyed for removable contamination on 14 Jul 93 by SPC Brinley. A total of 40 swipes were taken. See Attachment 1 for the location of each swipe.

The swipes were analyzed for gamma contamination, utilizing the LKB Gammawell Counter on 14 Jul 93. See Attachment 2 for the MDAs and associated efficiencies. No gamma contamination was found above 200 dpm for I-125 or above 2000 dpm for any other isotope.

The swipes were analyzed for beta contamination, utilizing the Beckman Liquid Scintillation Counter Model 5000 on 14 Jul 93. See Attachment 3 for the MDAs and associated efficiencies. No beta contamination was found above 200 dpm for any isotope.

FIXED CONTAMINATION

A fixed gamma survey was conducted on 14 Jul 93 by SPC Brinley. The highest exposure rate found was 21.4 uR/hr. See Attachment 4 for the location of readings taken.

A fixed beta survey was conducted on 26 Jul 93 by SPC Brinley. The highest number of counts found during a one minute count-time was 43 cpm. The average number of counts found during a one minute count-time was 35 cpm. See Attachment 5 for the location of readings taken.

As well as being reviewed at the time of the survey/receipt of laboratory results, all pertinent survey data was reviewed and compiled here by SFC Green on 9 Aug 93.

Ke /est Decommissioning Survey

Removable Contamination Survey-Hallway 6 Scale 1 inch = 4 feet



Conducted by: <u>SPC Brinley</u> on <u>14 Jul 93</u> Lab analysis by (gamma): <u>SSG Koelker</u> on <u>14 Jul 93</u> (beta) : <u>SSG Koelker</u> on <u>14 Jul 93</u>

3 Reviewed by: on

Attachment 1

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QUALITY ASSURANCE REPORT - GAMMA FOR DATE: 07/14/93

	BKG	MDA	EFF / ISO
LKB:			•
CHANNEL 1:	49 CPM	30.1 DPM	0.764 / I-125
CHANNEL 2:	197 CPM	676.4 DPM	0.068 / CR-51
BECKMAN:	· · ·	1	-
CHANNEL 1:	46 CPM	23.0 DPM	0.970 / I-125
CHANNEL 2:	194 CPM	440.0 DPM	0.104 / CR-51

ATTACHMENT 2

QUALITY ASSURANCE REPORT - BETA FOR DATE: 07/14/93

		F	BKG	MD	ł	EFF	1	ISO
BECKMAN	L5000TD:							
CHANNEL	1:	31	CPM	28.8	DPM	0.636	/	H-3
CHANNEL	2:	28	CPM	18.1	DPM	0.962	/	C-14
CHANNEL	3:	25	СРМ	16.5	DPM	1.004	/	P-32
BECKMAN	LS6800:		·					
CHANNEL	1:	33	СРМ	32.4	DPM	0.583	1	H-3
CHANNEL	2:	25	СРМ	17.2	DPM	0.954	/	C-14
CHANNEL	3:	21	CPM	14.9	DPM	1.011	/	P-32

ATTACHMENT 3

Ke Vest Decommissioning Survey

Fixed Gamma Contamination Survey-Hallway 6 Scale 1 inch = 4 feet



Conducted by: <u>SPC Brinley</u> on <u>14 Jul 93</u> All-Measurements are in uR/hr

Reviewed	by: Mu	Il shain	<u> </u>	100	Ju	93
				pi -	\mathcal{T}	
	•	Attachment 4			• •	

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Key est Decommissioning Survey

Fixed Beta Contamination Survey-Hallway 6 Scale 1 inch = 4 feet



Conducted by: <u>SPC Brinley</u> on <u>26 Jul 93</u> All Measurements are Gross Counts in One Minute

Reviewed by Donald Pream on 10 aug 43

KEY WEST DECOMMISSIONING SURVEY

Hallway - 7

REMOVABLE CONTAMINATION

Hallway Number 7 was surveyed for removable contamination on 14 Jul 93 by SPC Brinley. A total of 93 swipes were taken. See Attachment 1 for the location of each swipe.

The swipes were analyzed for gamma contamination, utilizing the LKB Gammawell Counter on 14 Jul 93. See Attachment 2 for the MDAs and associated efficiencies. No gamma contamination was found above 200 dpm for I-125 or above 2000 dpm for any other isotope.

The swipes were analyzed for beta contamination, utilizing the Beckman Liquid Scintillation Counter Model 6800 on 14 Jul 93. See Attachment 3 for the MDAs and associated efficiencies. No beta contamination was found above 200 dpm for any isotope.

FIXED CONTAMINATION

A fixed gamma survey was conducted on 14 Jul 93 by SSG Webster. The highest exposure rate found was 18.3 uR/hr. See Attachment 4 for the location of readings taken.

A fixed beta survey was conducted on 26 Jul 93 by SPC Brinley. The highest number of counts found during a one minute count-time was 88 cpm. The average number of counts found during a one minute count-time was 40 cpm. See Attachment 5 for the location of readings taken.

As well as being reviewed at the time of the survey/receipt of laboratory results, all pertinent survey data was reviewed and compiled here by SFC Green on 9 Aug 93.

Key V t Decommissioning Survey





QUALITY ASSURANCE REPORT - GAMMA FOR DATE: 07/14/93

	BKG	MDA	EFF / ISO
LKB:			
CHANNEL 1:	49 CPM	30.1 DPM	0.764 / I-125
CHANNEL 2:	197 CPM	676.4 DPM	0.068 / CR-51
BECKMAN:		,	
CHANNEL 1:	46 CPM	23.0 DPM	0.970 / I-125
CHANNEL 2:	194 CPM	440.0 DPM	0.104 / CR-51

ATTACHMENT 2

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QUALITY ASSURANCE REPORT - BETA FOR DATE: 07/14/93

	T = 0.0000.	E	BKG	MD2	A .	EFF	/	ISO
BECKMAN	<u>L5000TD:</u>							
CHANNEL	1:	31	СРМ	28.8	DPM	0.636	/	H-3
CHANNEL	2:	28	CPM	18.1	DPM	0.962	/	C-14
CHANNEL	3:	25	CPM	16.5	DPM	1.004	/	P-32
BECKMAN	LS6800:							
CHANNEL	1:	33	СРМ	32.4	DPM	0.583	1	H-3
CHANNEL	2:	25	CPM	17.2	DPM	0.954	/	C-14
CHANNEL	3:	21	CPM	14.9	DPM	1.011	1	P-32

ATTACHMENT 3

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Ke Jest Decommissioning Survey



Fixed Gamma Contamination Survey-Hallway 7

Key st Decommissioning Survey





KEY WEST DECOMMISSIONING SURVEY

Hallway - 8

REMOVABLE CONTAMINATION

Hallway Number 8 was surveyed for removable contamination on 21 Jun (South end) and 30 Jun (North end) 93 by SPC Brinley. A total of 118 swipes were taken. See Attachment 1 for the location of each swipe.

The swipes were analyzed for gamma contamination, utilizing the LKB Gammawell Counter on 21 and 30 Jun 93. See Attachment 2 for the MDAs and associated efficiencies. No gamma contamination was found above 200 dpm for I-125 or above 2000 dpm for any other isotope.

The swipes were analyzed for beta contamination, utilizing the Beckman Liquid Scintillation Counter Model 6800 on 21 and 30 Jun 93. See Attachment 3 for the MDAs and associated efficiencies. No beta contamination was found above 200 dpm for any isotope.

FIXED CONTAMINATION

A fixed gamma survey was conducted on 21 and 30 Jun 93 by SPC Brinley. The highest exposure rate found was 30.7 uR/hr. See Attachment 4 for the location of readings taken.

A fixed beta survey was conducted on 26 Jul 93 by SPC Brinley. The highest number of counts found during a one minute count-time was 79 cpm. The average number of counts found during a one minute count-time was 40 cpm. See Attachment 5 for the location of readings taken.

As well as being reviewed at the time of the survey/receipt of laboratory results, all pertinent survey data was reviewed and compiled here by SFC Green on 9 Aug 93.

Key West Decommissioning Survey





Conducted by: <u>SPC Brinley</u> on <u>21 Jun 93</u> and <u>30 Jun 93</u> Lab analysis by (gamma): <u>SSG Koelker</u> on <u>21 Jun 93</u> and <u>30 Jun 93</u> (beta): <u>SSG Koelker</u> on <u>21 Jun 93</u> and <u>30 Jun 93</u>

93 Reviewed by:

Remova --- Contamination Survey-Hallway 8 Scale 1 inch = 4 feet



Conducted by: <u>SPC Brinley</u> on <u>21 Jun 93</u> and <u>30 Jun 93</u> Lab analysis by (gamma): <u>SSG Koelker</u> on <u>21 Jun 93</u> and <u>30 Jun 93</u> (beta): <u>SSG Koelker</u> on <u>21 Jun 93</u> and <u>30 Jun 93</u>

Reviewed by on []]

QUALITY ASSURANCE REPORT - GAMMA FOR DATE: 06/21/93

	1	BKG	MDA	EFF / ISO
LKB:				
CHANNEL 1:	53	CPM	32.2 DPM	0.742 / I-125
CHANNEL 2:	198	СРМ	709.2 DPM	0.065 / CR-51
				· •
BECKMAN:				
CHANNEL 1:	52	CPM	22.1 DPM	1.075 / I-125
CHANNEL 2:	198	CPM	452.3 DPM	0.102 / CR-51

ATTACHMENT 2

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QUALITY ASSURANCE REPORT - GAMMA FOR DATE: 06/30/93

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		BKG	MDA	EFF / ISO
LKB:				
CHANNEL	1:	53 CPM	32.2 DPM	0.742 / I-125
CHANNEL	2: 3	198 CPM	709.2 DPM	0.065 / CR-51
BECKMAN:			· .	
CHANNEL	1:	52 CPM	22.1 DPM	1.075 / I-125
CHANNEL	2:	L98 CPM	452.3 DPM	0.102 / CR-51

ATTACHMENT 2.

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QUALITY ASSURANCE REPORT - BETA FOR DATE: 06/21/93

BECKMAN L5000TD:	BKG	MDA	EFF / ISO
CHANNEL 1:	N/A	N/A	N/A
CHANNEL 2:	N/A	N/A	N/A
CHANNEL 3:	N/A	N/A	N/A
BECKMAN LS6800:			
CHANNEL 1:	29 CPM	28.1 DPM	0.630 / H-3
CHANNEL 2:	35 CPM	20.1 DPM	0.968 / C-14
CHANNEL 3:	41 CPM	20.9 DPM	1.007 / P-32

ATTACHMENT 3

QUALITY ASSURANCE REPORT - BETA FOR DATE: 06/30/93

BECKMAN L5000TD:	BKG	MDA	EFF / ISO
CHANNEL 1:	N/A	N/A	N/A
CHANNEL 2:	N/A	N/A	N/A
CHANNEL 3:	N/A	N/A	N/A
BECKMAN LS6800:		. ·	
CHANNEL 1:	17 CPM	23.4 DPM	0.579/H-3
CHANNEL 2:	30 CPM	19.0 DPM	0.947/C-14
CHANNEL 3:	40 CPM	20.7 DPM	1.007/P-32

ATTACHMENT 3

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Key West Decommissioning Survey





Conducted by: <u>SPC Brinley</u> on <u>21 Jun 93</u> and <u>30 Jun 93</u> All Measurements are in uR/hr

Reviewed by: on // 3

Key West Decommissioning Survey





Conducted by: <u>SPC Brinley</u> on <u>21 Jun 93</u> and <u>30 Jun 93</u> All Measurements are in uR/hr Reviewed by: 1193 on 🥂 Attachment 4



Conducted by: <u>SFC Brinley</u> on <u>26 Jul 93</u> All Measurements are Gross Counts in One Minute

Reviewed by: Imul _ on <u>//</u> laan

Key West Decommissioning Survey

Fixed Beta Contamination Survey-Hallway 8 Scale 1 inch = 4 feet



Conducted by: <u>SPC Brinley</u> on <u>26 Jul 93</u> All Measurements are Gross Counts in One Minute

Con on 10 aug 23 Reviewed by:

KEY WEST DECOMMISSIONING SURVEY

Hallway - 9

REMOVABLE CONTAMINATION

Hallway Number 9 was surveyed for removable contamination on 30 Jun (South end) and 2 Jul (Mid Section) and 6 Jul (North end) 93 by SPC Brinley. A total of 152 swipes were taken. See Attachment 1 for the location of each swipe.

The swipes were analyzed for gamma contamination, utilizing the LKB Gammawell Counter on 30 Jun, 2 and 6 Jul 93. See Attachment 2 for the MDAs and associated efficiencies. No gamma contamination was found above 200 dpm for I-125 or above 2000 dpm for any other isotope.

The swipes were analyzed for beta contamination, utilizing the Beckman Liquid Scintillation Counter Model 6800 on 30 Jun, 2 and 6 Jul 93. See Attachment 3 for the MDAs and associated efficiencies. No beta contamination was found above 200 dpm for any isotope.

FIXED CONTAMINATION

Fixed gamma surveys were conducted on 30 Jun, 2 and 6 Jul 93 by SSGs Webster and Koelker. The highest exposure rate found was 28.4 uR/hr. See Attachment 4 for the location of readings taken.

A fixed beta survey was conducted on 26 Jul 93 by SPC Brinley. The highest number of counts found during a one minute count-time was 67 cpm. The average number of counts found during a one minute count-time was 45 cpm. See Attachment 5 for the location of readings taken.

As well as being reviewed at the time of the survey/receipt of laboratory results, all pertinent survey data was reviewed and compiled here by SFC Green on 9 Aug 93.





Conducted by: SPC Brinley on 30 Jun, 02 Jul and 06 Jul 93
Lab analysis by (gamma): SSG Koelker on 30 Jun, 02 Jul and 06 Jul 93
(beta): SSG Koelker on 30 Jun, 02 Jul and 06 Jul 93
1 ALVE CO
Reviewed by: Mala C-/Nen on 10 lup 73
Attachment 1

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contamination Survey-Hallway 9 Scale 1 inch = 4 feet



Conducted by: <u>SPC Brinley</u> on <u>30 Jun</u>, <u>02 Jul</u> and <u>06 Jul 93</u> Lab analysis by (gamma): <u>SSG Koelker</u> on <u>30 Jun</u>, <u>02 Jul</u> and <u>06 Jul 93</u> (beta) : <u>SSG Koelker</u> on <u>30 Jun</u>, <u>02 Jul</u> and <u>06 Jul 93</u>

on 10 aug 93 Reviewed by: Attachment 1

Key West Decommissioning Survey

Removable Contamination Survey-Hallway 9 Scale 1 inch = 4 feet



Conducted by: <u>SPC Brinley</u> on <u>30 Jun</u>, <u>02 Jul</u> and <u>06 Jul 93</u> Lab analysis by (gamma): <u>SSG Koelker</u> on <u>30 Jun</u>, <u>02 Jul</u> and <u>06 Jul 93</u> (beta) : <u>SSG Koelker</u> on <u>30 Jun</u>, <u>02 Jul</u> and <u>06 Jul 93</u>



QUALITY ASSURANCE REPORT - GAMMA FOR DATE: 06/30/93

	BKG	MDA	EFF / ISO
LKB:	• •		· · · ·
CHANNEL 1:	53 CPM	32.2 DPM	0.742 / I-125
CHANNEL 2:	198 CPM	709.2 DPM	0.065 / CR-51
BECKMAN:			
CHANNEL 1:	52 CPM	22.1 DPM	1.075 / I-125
CHANNEL 2:	198 CPM	452.3 DPM	0.102 / CR-51

ATTACHMENT 2

QUALITY ASSURANCE REPORT - GAMMA FOR DATE: 07/02/93

*	BKG	MDA	EFF / ISO
LKB:			
CHANNEL 1:	53 CPM	32.2 DPM	0.742 / I-125
CHANNEL 2:	198 CPM	709.2 DPM	0.065 / CR-51
· · ·			•
BECKMAN:	· · · · · · · · · · · · · · · ·		
CHANNEL 1:	52 CPM	22.1 DPM	1.075 / I-125
CHANNEL 2:	198 CPM	452.3 DPM	0.102 / CR-51

ATTACHMENT 2

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QUALITY ASSURANCE REPORT - GAMMA FOR DATE: 07/06/93

	BKG	MDA	EFF	/ ISO
LKB:			κ.	
CHANNEL 1:	53 CPM	32.2 I	OPM 0.742	/ I-125
CHANNEL 2:	198 CPM	1 709.2 I	OPM 0.065	/ CR-51
				-
BECKMAN:				
CHANNEL 1:	52 CP1	1 22.1 I	DPM 1.075	/ 1-125
CHANNEL 2:	198 CPM	452.3 I	OPM 0.102	/ CR-51

ATTACHMENT 2

QUALITY ASSURANCE REPORT - BETA FOR DATE: 06/30/93

		BKG	MDA EI	FF / ISO
BECKMAN	L5000TD:			
CHANNEL	1:	N/A	N/A	N/A
CHANNEL	2:	N/A	N/A	N/A
CHANNEL	3:	N/A	N/A	N/A

BECKMAN LS6800:

CHANNEL	1:	17 CPM	23.4 DPM	0.579/H-3
CHANNEL	2:	30 CPM	19.0 DPM	0.947/C-14
CHANNEL	3:	40 CPM	20.7 DPM	1.007/P-32

ATTACHMENT 3

QUALITY ASSURANCE REPORT - BETA FOR DATE: 07/02/93

		BKG	MDA EFF	' / ISO
BECKMAN	L5000TD:			
CHANNEL	1:	N/A	N/A	N/A
CHANNEL	2:	N/A	N/A	N/A
CHANNEL	3:	N/A	N/A	N/A

BECKMAN LS6800:

CHANNEL	1:	17 CPM	23.4 DPM	0.579/H-3
CHANNEL	2:	30 CPM	19.0 DPM	0.947/C-14
CHANNEL	3:	40 CPM	20.7 DPM	1.007/P-32

ATTACHMENT 3

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QUALITY ASSURANCE REPORT - BETA FOR DATE: 07/06/93

BECKMAN L5000TD:	BKG	MDA	EFF / ISO
CHANNEL 1:	N/A	N/A	N/A
CHANNEL 2:	N/A	N/A	N/A
CHANNEL 3:	N/A	N/A	N/A
BECKMAN LS6800:			
CHANNEL 1:	39 CPM	36.4 DPM	0.561 / H-3
CHANNEL 2:	26 CPM	17.6 DPM	0.950 / C-14
CHANNEL 3:	24 CPM	16.1 DPM	1.002 / P-32

ATTACHMENT 3

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Attachment 4

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Conducted by: <u>SSG Webster</u> and <u>SSG Koelker</u> on <u>30 Jun</u>, <u>02 Jul</u> and <u>06 Jul 93</u> All Measurements are in uR/hr

on 10 aur 93 Reviewed by: M 1.1.1 ŧ i



Conducted by: <u>SSG Webster</u> and <u>SSG Koelker</u> on <u>30 Jun</u>, <u>02 Jul</u> and <u>06 Jul 93</u> ,All Measure, inents are in uR/hr

Reviewed by: ean on 1 3. Attachment 4 14











Conducted by: <u>SPC Brinley</u> on <u>26'Jul 93</u> All Measurements are Gross Coupts in One Minute

Reviewed by: 93 <u>len on 10</u>

Fixed Be. Contamination Survey-Hallway 9 Scale 1 inch = 4 feet



Conducted by: <u>SPC Brinley</u> on <u>26 Jul 93</u> All Measurements are Gross Counts in One Minute

Reviewed by:

Attachment 5

<u>m</u> on <u>10</u>

<u>e93</u>

KEY WEST DECOMMISSIONING SURVEY

Hallway - 10

REMOVABLE CONTAMINATION

Hallway Number 10 and Closet were surveyed for removable contamination on 14 Jul and 17 Jun 93(respectively) by SPC Brinley. A total of 44 swipes were taken. See Attachment 1 for the location of each swipe.

The swipes were analyzed for gamma contamination, utilizing the LKB Gammawell Counter on 17 Jun and 14 Jul 93. See Attachment 2 for the MDAs and associated efficiencies. No gamma contamination was found above 200 dpm for I-125 or above 2000 dpm for any other isotope.

The swipes were analyzed for beta contamination, utilizing the Beckman Liquid Scintillation Counter Model 6800 on 17 Jun and 14 Jul 93. See Attachment 3 for the MDAs and associated efficiencies. No beta contamination was found above 200 dpm for any isotope.

FIXED CONTAMINATION

Fixed gamma surveys were conducted on 14 Jul 93 by SPC Brinley. The highest exposure rate found was 18.4 uR/hr. See Attachment 4 for the location of readings taken.

A fixed beta survey was conducted on 26 Jul 93 by SPC Brinley. The highest number of counts found during a one minute count-time was 89 cpm. The average number of counts found during a one minute count-time was 60 cpm. See Attachment 5 for the location of readings taken.

As well as being reviewed at the time of the survey/receipt of laboratory results, all pertinent survey data was reviewed and compiled here by SFC Green on 9 Aug 93.



Removable Contamination Survey-Hallway 10 Scale 1 inch = 4 feet



Conducted by: <u>SPC Brinley</u> on <u>17 Jun 93</u> and <u>14 Jul 93</u> Lab analysis by (gamma): <u>SSG Koelker</u> on <u>17 Jun 93</u> and <u>14 Jul 93</u> (beta): <u>SSG Koelker</u> or <u>17 Jun 93</u> and <u>14 Jul 93</u>

93 Reviewed by on / ODA
QUALITY ASSURANCE REPORT - GAMMA FOR DATE: 06/17/93

	BKG	MDA	EFF / ISO
LKB:			
CHANNEL 1:	51 CPM	33.2 DPM	0.707 / I-125
CHANNEL 2:	206 CPM	587.0 DPM	0.080 / CR-51
BECKMAN:			
CHANNEL 1:	N/A	N/A	N/A
CHANNEL 2:	N/A	N/A	N/A

QUALITY ASSURANCE REPORT - GAMMA FOR DATE: 07/14/93

		В	KG	MDZ	ł	EFF	/	' ISO
LKB:							-	•
CHANNEL	1:	49	CPM	30.1	DPM	0.764	/	I-125
CHANNEL	2:	197	СРМ	676.4	DPM	0.068	/	CR-51
BECKMAN:	-							
CHANNEL	1:	46	СРМ	23.0	DPM	0.970	/	I-125
CHANNEL	2:	194	СРМ	440.0	DPM	0.104	/	CR-51

QUALITY ASSURANCE REPORT - BETA FOR DATE: 06/17/93

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BECKMAN L50	BK 00TD:	G MD2	A EFF	/ ISO
CHANNEL 1:	N/	A N/	A N	/A
CHANNEL 2:	N/	A N/	A N	/A
CHANNEL 3:	N/	A N/	A N	/A
BECKMAN LS6	800:			
CHANNEL 1:	29 C	PM 28.1	DPM 0.630	/ H-3
CHANNEL 2:	35 C	PM 20.1	DPM 0.968	/ C-14
CHANNEL 3:	41 C	PM 20.9	DPM 1.007	/ P-32

QUALITY ASSURANCE REPORT - BETA FOR DATE: 07/14/93

BECKMAN	L5000TD:	E	BKG	MD7	4	EFF	/	ISO
CHANNEL	1:	31	СРМ	28.8	DPM	0.636	1	H-3
CHANNEL	2:	28	CPM	18.1	DPM	0.962	/	C-14
CHANNEL	3:	25	CPM	16.5	DPM	1.004	!	P-32
BECKMAN	LS6800:					·		
CHANNEL	1:	33	CPM	32.4	DPM	0.583	1	Н-З
CHANNEL	2:	25	CPM	17.2	DPM	0.954	1	C-14
CHANNEL	3:	21	CPM	14.9	DPM	1.011	1	P-32

Key west Decommissioning Survey

Fixed Gamma Contamination Survey-Hallway 10 Scale 1 inch = 4 feet





Conducted by: SPC Brinley on 14 Jul 93 All Measurements are in uR/hr on <u>10 Aug 93</u> Reviewed by:



Key ... est Decommissioning Survey

KEY WEST DECOMMISSIONING SURVEY

Hallway - 11

REMOVABLE CONTAMINATION

Hallway Number 11 was surveyed for removable contamination on 2 Jul 93 by SPC Brinley. A total of 90 swipes were taken. See Attachment 1 for the location of each swipe.

The swipes were analyzed for gamma contamination, utilizing the LKB Gammawell Counter on 2 Jul 93. See Attachment 2 for the MDAs and associated efficiencies. No gamma contamination was found above 200 dpm for I-125 or above 2000 dpm for any other isotope.

The swipes were analyzed for beta contamination, utilizing the Beckman Liquid Scintillation Counter Model 6800 on 2 Jul 93. See Attachment 3 for the MDAs and associated efficiencies. No beta contamination was found above 200 dpm for any isotope.

FIXED CONTAMINATION

Fixed gamma surveys were conducted on 2 Jul 93 by SPC Brinley. The highest exposure rate found was 24.4 uR/hr. See Attachment 4 for the location of readings taken.

A fixed beta survey was conducted on 26 Jul 93 by SPC Brinley. The highest number of counts found during a one minute count-time was 48 cpm. The average number of counts found during a one minute count-time was 32 cpm. See Attachment 5 for the location of readings taken.

As well as being reviewed at the time of the survey/receipt of laboratory results, all pertinent survey data was reviewed and compiled here by SFC Green on 9 Aug 93.

Key West Decommissioning Survey

Removable Contamination Survey-Hallway 11 Scale 1 inch = 4 feet



Key West Decommissioning Survey

Removable Contamination Survey-Hallway 11 Scale 1 inch = 4 feet



Lab analysis by (gamma): <u>SSG Koelker</u> on <u>02 Jul 93</u> (beta) : <u>SSG Koelker</u> on <u>02 Jul 93</u> Reviewed by: <u>mala</u> <u>Mem</u> on <u>D <u>Mur</u> <u>63</u> Attachment 1</u>

QUALITY ASSURANCE REPORT - GAMMA FOR DATE: 07/02/93

	BKG	MD	A EFF	/ ISO
LKB:		•		
CHANNEL 1:	53 CP	M 32.2	DPM 0.742	/ I-125
CHANNEL 2:	198 CP	M 709.2	DPM 0.065	/ CR-51
BECKMAN:				
CHANNEL 1:	52 CP	M 22.1	DPM 1.075	/ I-125
CHANNEL 2:	198 CP	M 452.3	DPM 0.102	/ CR-51

ATTACHMENT 2

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QUALITY ASSURANCE REPORT - BETA FOR DATE: 07/02/93

BECKMAN	L5000TD:	BKG	MDA	EFF / ISO
CHANNEL	1:	N/A	N/A	N/A
CHANNEL	2:	N/A	N/A	N/A
CHANNEL	3:	N/A	N/A	N/A
BECKMAN	LS6800:	•		
CHANNEL	1:	17 CPM	23.4 DPM	0.579/H-3
CHANNEL	2:	30 CPM	19.0 DPM	0.947/C-14
CHANNEL	3:	40 CPM	20.7 DPM	1.007/P-32

ATTACHMENT 3

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Key 'st Decommissioning Survey







Key V → t Decommissioning Survey

Fixed Beta Contamination Survey-Hallway 11 Scale 1 inch = 4 feet



Key V st Decommissioning Survey

Fixed Beta Contamination Survey-Hallway 11 Scale 1 inch = 4 feet



KEY WEST DECOMMISSIONING SURVEY

Laboratory - 18

REMOVABLE CONTAMINATION

Laboratory Number 18 was surveyed for removable contamination on 16 Jun 93 by SSG Webster. A total of 141 swipes were taken. See Attachment 1 for the location of each swipe.

The swipes were analyzed for gamma contamination, utilizing the LKB Gammawell Counter on 16 Jun 93. See Attachment 2 for the MDAs and associated efficiencies. No gamma contamination was found above 200 dpm for I-125 or above 2000 dpm for any other isotope.

The swipes were analyzed for beta contamination, utilizing the Beckman Liquid Scintillation Counter Model 6800 on 16 Jun 93. See Attachment 3 for the MDAs and associated efficiencies. No beta contamination was found above 200 dpm for any isotope.

FIXED CONTAMINATION

A fixed gamma survey was conducted on 16 Jun 93 by SPC Brinley. The highest exposure rate found was 22.0 uR/hr. The average exposure rate was approximately 11 uR/hr. See Attachment 4 for the location of readings taken.

A fixed beta survey was conducted on 23 Jul 93 by SPC Brinley. The highest number of counts found during a one minute count-time was 102 cpm. The average number of counts found during a one minute count-time was 55 cpm. See Attachment 5 for the location of readings taken.

As well as being reviewed at the time of the survey/receipt of laboratory results, all pertinent survey data was reviewed and compiled here by SFC Green on 8 Aug 93.

Key st Decommissioning Survey

Removable Contamination Survey-Laboratory 18 Scale 1 inch = 4 feet



Conducted by: <u>SSG Webster</u> on <u>16 Jun 93</u> Lab analysis by (gamma): <u>CPT Melanson</u> on <u>16 Jun 93</u> (beta) : <u>CPT Melanson</u> on <u>16 Jun 93</u> Reviewed by: <u>mail</u> <u>Marc</u> on <u>10 Mg 93</u>

Key est Decommissioning Survey

Removable Contamination Survey-Laboratory 18 Scale 1 inch = 4 feet



QUALITY ASSURANCE REPORT - GAMMA FOR DATE: 06/16/93

	BKG	MDA	EFF / ISO
LKB:			
CHANNEL 1:	48 CPM	29.9 DPM	0.762 / I-125
CHANNEL 2:	201 CPM	576.4 DPM	0.081 / CR-51
BECKMAN:		•	
CHANNEL 1:	N/A	N/A	N/A
CHANNEL 2:	N/A	N/A	N/A

QUALITY ASSURANCE REPORT - BETA FOR DATE: 06/16/93

	BKG	MDA	EFF / ISO
BECKMAN L5000TD:			
CHANNEL 1:	N/A	N/A	N/A
CHANNEL 2:	N/A	N/A	N/A
CHANNEL 3:	N/A	N/A	N/A
BECKMAN LS6800:			
CHANNEL 1:	29 CPM	28.1 DPM	0.630 / H-3
CHANNEL 2:	35 CPM	20.1 DPM	0.968 / C-14
CHANNEL 3:	41 CPM	20.9 DPM	1.007 / P-32

ATTACHMENT 3

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Key st Decommissioning Survey

Fixed Gamma Contamination Survey-Laboratory 18 Scale 1 inch = 4 feet



Key \ st Decommissioning Survey





KEY WEST DECOMMISSIONING SURVEY

Laboratory - 19

REMOVABLE CONTAMINATION

Laboratory Number 19 was surveyed for removable contamination on 23 Jun 93 by SPC Brinley. A total of 205 swipes were taken. See Attachment 1 for the location of each swipe.

The swipes were analyzed for gamma contamination, utilizing the LKB Gammawell Counter on 23 Jun 93. See Attachment 2 for the MDAs and associated efficiencies. No gamma contamination was found above 200 dpm for I-125 or above 2000 dpm for any other isotope.

The swipes were analyzed for beta contamination, utilizing the Beckman Liquid Scintillation Counter Model 6800 on 23 Jun 93. See Attachment 3 for the MDAs and associated efficiencies. No beta contamination was found above 200 dpm for any isotope.

FIXED CONTAMINATION

A fixed gamma survey was conducted on 23 Jun 93 by SPC Brinley. The highest exposure rate found was 26.1 uR/hr. The average exposure rate was approximately 10.5 uR/hr. See Attachment 4 for the location of readings taken.

A fixed beta survey was conducted on 23 Jul 93 by SPC Brinley. The highest number of counts found during a one minute count-time was 119 cpm. The average number of counts found during a one minute count-time was 60 cpm. See Attachment 5 for the location of readings taken.

As well as being reviewed at the time of the survey/receipt of laboratory results, all pertinent survey data was reviewed and compiled here by SFC Green on 8 Aug 93.

Key st Decommissioning Survey





Key st Decommissioning Survey

Removable Contamination Survey-Laboratory 19 Scale 1 inch = 4 feet



QUALITY ASSURANCE REPORT - GAMMA FOR DATE: 06/23/93

÷.	BKG	MDA	EFF / ISO
LKB:	,		
CHANNEL 1:	49 CPM	33.4 DPM	0.688 / I-125
CHANNEL 2:	200 CPM	676.8 DPM	0.069 / CR-51
BECKMAN:			
CHANNEL 1:	N/A	N/A	N/A
CHANNEL 2:	N/A	N/A	N/A

ATTACHMENT 2

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QUALITY ASSURANCE REPORT - BETA FOR DATE: 06/23/93

BECKMAN I	15000TD:	BKG	MDA	EFF / ISO
CHANNEL 1	L:	N/A	N/A	N/A
CHANNEL 2	2:	N/A	N/A	N/A
CHANNEL 3	3:	N/A	N/A	N/A
BECKMAN I	<u> 56800:</u>			
CHANNEL 1	L:	29 CPM	28.1 DPM	0.630 / H-3
CHANNEL 2	2:	35 CPM	20.1 DPM	0.968 / C-14
CHANNEL 3	3:	41 CPM	20.9 DPM	1.007 / P-32

ATTACHMENT 3

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Key st Decommissioning Survey







KEY WEST DECOMMISSIONING SURVEY

Laboratory - 20

REMOVABLE CONTAMINATION

Laboratory Number 20 was surveyed for removable contamination on 22 Jun 93 by SSG Webster. The walk-in refer adjoining it was surveyed on 25 Jul by SPC Brinley. A total of 76 swipes were taken. See Attachment 1 for the location of each swipe.

The swipes were analyzed for gamma contamination, utilizing the LKB Gammawell Counter on 22 Jun 93. See Attachment 2 for the MDAs and associated efficiencies for the 22 Jun survey. Laboratory analysis for the 25 Jul survey was conducted by the Technical Services Branch, HPO, rather than on-site. The Quality Assurance records for Technical Services is available for inspection at all times. No gamma contamination was found above 200 dpm for I-125 or above 2000 dpm for any other isotope.

The swipes were analyzed for beta contamination, utilizing the Beckman Liquid Scintillation Counter Model 6800 on 22 Jun 93. See Attachment 3 for the MDAs and associated efficiencies. Technical Services Branch also provided the analysis for the beta contamination for the 25 Jul survey. No beta contamination was found above 200 dpm for any isotope.

FIXED CONTAMINATION

A fixed gamma survey was conducted on 22 Jun 93 by SPC Brinley. The highest exposure rate found was 20.7 uR/hr. The average exposure rate was approximately 9.4 uR/hr. See Attachment 4 for the location of readings taken.

A fixed beta survey was conducted on 23 Jul 93 by SPC Brinley. The highest number of counts found during a one minute count-time was 64 cpm. The average number of counts found during a one minute count-time was 50 cpm. See Attachment 5 for the location of readings taken.

As well as being reviewed at the time of the survey/receipt of laboratory results, all pertinent survey data was reviewed and compiled here by SFC Green on 8 Aug 93.

Key st Decommissioning Survey

Removable Contamination Survey-Laboratory 20 Scale 1 inch = 4 feet



Conducted by: <u>SPC Brinley</u> on <u>22 Jun 93</u> Lab analysis by (gamma): <u>SSG Koelker</u> on <u>22 Jun 93</u> (beta) : <u>SSG Koelker</u> on <u>22 Jun 93</u>

Reviewed by on 100

QUALITY ASSURANCE REPORT - GAMMA FOR DATE: 06/22/93

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	BKG	MDA	EFF / ISO
LKB:			
CHANNEL 1:	50 CPM	31.6 DPM	0.735 / I-125
CHANNEL 2:	203 CPM	950.9 DPM	0.049 / CR-51
BECKMAN:			
CHANNEL 1:	N/A	N/A	N/A
CHANNEL 2:	N/A	N/A	N/A

ATTACHMENT 2

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QUALITY ASSURANCE REPORT - BETA FOR DATE: 06/22/93

BECKMAN L5000TI	BKG D:	MDA	EFF / ISO
CHANNEL 1:	N/A	N/A	N/A
CHANNEL 2:	N/A	N/A	N/A
CHANNEL 3:	N/A	N/A	N/A
BECKMAN LS6800:	<u>L</u>	· · ·	
CHANNEL 1:	29 CPM	28.1 DPM	0.630 / H-3
CHANNEL 2:	35 CPM	20.1 DPM	0.968 / C-14
CHANNEL 3:	41 CPM	20.9 DPM	1.007 / P-32

ATTACHMENT 3

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Ke_ /est Decommissioning Survey

Fixed Gamma Contamination Survey-Laboratory 20 Scale 1 inch = 4 feet



Conducted by: SPC Brinley on 22 Jun 93 All-Measurements are in uR/hr

Reviewed by 220 on 1011493 Attachment 4

Key 3st Decommissioning Survey





Conducted by: <u>SPC Brinley</u> on <u>23 Jul 93</u> All Measurements are Gross Counts in One Minute

Reviewed by: 10nala Kinain on 10/149 93
KEY WEST DECOMMISSIONING SURVEY

Laboratory - 21

REMOVABLE CONTAMINATION

Laboratory Number 21 was surveyed for removable contamination on 30 Jun 93 by SPC Brinley. A total of 105 swipes were taken. See Attachment 1 for the location of each swipe.

The swipes were analyzed for gamma contamination, utilizing the LKB Gammawell Counter on 30 Jun 93. See Attachment 2 for the MDAs and associated efficiencies. No gamma contamination was found above 200 dpm for I-125 or above 2000 dpm for any other isotope.

The swipes were analyzed for beta contamination, utilizing the Beckman Liquid Scintillation Counter Model 6800 on 30 Jun 93. See Attachment 3 for the MDAs and associated efficiencies. No beta contamination was found above 200 dpm for any isotope.

FIXED CONTAMINATION

A fixed gamma survey was conducted on 30 Jun 93 by SPC Brinley. The highest exposure rate found was 22.2 uR/hr. The average exposure rate was approximately 9 uR/hr. See Attachment 4 for the location of readings taken.

A fixed beta survey was conducted on 23 Jul 93 by SPC Brinley. The highest number of counts found during a one minute count-time was 169 cpm. The average number of counts found during a one minute count-time was approximately 80 cpm. See Attachment 5 for the location of readings taken.

As well as being reviewed at the time of the survey/receipt of laboratory results, all pertinent survey data was reviewed and compiled here by SFC Green on 8 Aug 93.

Key ¹ it Decommissioning Survey

Removable Contamination Survey-Laboratory 21 Scale 1 inch = 4 feet



Key st Decommissioning Survey

Removable Contamination Survey-Laboratory 21 Scale 1 inch = 4 feet



QUALITY ASSURANCE REPORT - GAMMA FOR DATE: 06/30/93

	BKG	MDA	EFF / ISO
LKB:	:		
CHANNEL 1:	54 CPM	45.5 DPM	0.530 / I-125
CHANNEL 2:	204 CPM	948.4 DPM	0.050 / CR-51
BECKMAN:		,	
CHANNEL 1:	N/A	N/A	N/A
CHANNEL 2:	N/A	N/A	N/A

ATTACHMENT 2

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QUALITY ASSURANCE REPORT - BETA FOR DATE: 06/30/93

		BKG	MDA I	EFF / ISO
BECKMAN	L5000TD:			
CHANNEL	1:	N/A	N/A	N/A
CHANNEL	2:	N/A	N/A	N/A
CHANNEL	3:	N/A	N/A	N/A
CHANNEL	3:	N/A	N/A	N/A

BECKMAN	LS6800:
Construction of the local division of the lo	

CHANNEL	3:	40 CPM	20.7 DPM	1.007/P-32
CHANNEL	2:	30 CPM	19.0 DPM	0.947/C-14
CHANNEL	1:	17 CPM	23.4 DPM	0.579/H-3

ATTACHMENT 3

Key W / Decommissioning Survey

Fixed Gamma Contamination Survey-Laboratory 21 Scale 1 inch = 4 feet



Conducted by: SPC Brinley on 30 Jun 93 All Measurements are in uR/hr Reviewed by: _•on _10 U



Conducted by: <u>SPC Brinley</u> on <u>23 Jul 93</u> All Measurements are Gross One Minute Counts

Reviewed by

Attachment 5

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n on

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KEY WEST DECOMMISSIONING SURVEY

Laboratory - 22

REMOVABLE CONTAMINATION

Laboratory Number 22 was surveyed for removable contamination on 9 Jul by SSG Koelker. A total of 149 swipes were taken. See Attachment 1 for the location of each swipe.

The swipes were analyzed for gamma contamination, utilizing the LKB Gammawell Counter on 12 Jul 93. See Attachment 2 for the MDAs and associated efficiencies. No gamma contamination was found above 200 dpm for I-125 or above 2000 dpm for any other isotope.

The swipes were analyzed for beta contamination, utilizing the Beckman Liquid Scintillation Counter Model 6800 on 12 Jul 93. See Attachment 3 for the MDAs and associated efficiencies. No beta contamination was found above 200 dpm for any isotope.

FIXED CONTAMINATION

A fixed gamma survey was conducted on 9 Jul by SSG Koelker. The highest exposure rate found was 20.1 uR/hr. The average exposure rate was approximately 8 uR/hr. See Attachment 4 for the location of readings taken.

A fixed beta survey was conducted on 23 Jul 93 by SPC Brinley. The highest number of counts found during a one minute count-time was 87 cpm. The average number of counts found during a one minute count-time was approximately 50 cpm. See Attachment 5 for the location of readings taken.

As well as being reviewed at the time of the survey/receipt of laboratory results, all pertinent survey data was reviewed and compiled here by SFC Green on 8 Aug 93.

Key V t Decommissioning Survey

Removable Contamination Survey-Laboratory 22 Scale 1 inch = 4 feet



Key Vost Decommissioning Survey

Removable Contamination Survey-Laboratory 22 Scale 1 inch = 4 feet



QUALITY ASSURANCE REPORT - GAMMA FOR DATE: 07/12/93

		BKG	MDA	EFF / ISO
LKB:				·
CHANNEL	1: 52	CPM :	30.9 DPM .	0.767 / I-125
CHANNEL :	2: 197	CPM 6	79.7 DPM	0.068 / CR-51
BECKMAN:	· · ·		•	
CHANNEL	1: 48	СРМ	25.0 DPM	0.912 / I-125
CHANNEL :	2: 205	CPM 49	90.2 DPM	0.096 / CR-51

ATTACHMENT 2

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QUALITY ASSURANCE REPORT - BETA FOR DATE: 07/12/93

BECKMAN	L5000TD:	BKG	MDA EFF	/ ISO
CHANNEL	1:	N/A	N/A	N/A
CHANNEL	2:	N/A	N/A	N/A
CHANNEL	3:	N/A	N/A	N/A

BECKMAN LS6800:

CHANNEL	1:	17	CPM	23.4	DPM	0.579/H-3
CHANNEL	2:	30	CPM	19.0	DPM	0.947/C-14
CHANNEL	3:	40	СРМ	20.7	DPM	1.007/P-32

ATTACHMENT 3

Key 1 st Decommissioning Survey

Fixed Gamma Contamination Survey-Laboratory 22 Scale 1 inch = 4 feet



Conducted by: <u>SSG Koelker</u> on <u>09 Jul 93</u> All Measurements are in uR/hr Reviewed by: <u>Mala K Sham</u>on <u>10 aug 93</u>



Conducted by: <u>SPC Brinley</u> on <u>23 Jul 93</u> All Measurements are Gross One Minute Counts

Reviewed by: 1*00 m*

KEY WEST DECOMMISSIONING SURVEY

Laboratory - 23

REMOVABLE CONTAMINATION

Laboratory Number 23 was surveyed for removable contamination on 28 Jun by SPC Brinley. A total of 124 swipes were taken. See Attachment 1 for the location of each swipe.

The swipes were analyzed for gamma contamination, utilizing the LKB Gammawell Counter on 28 Jun 93. See Attachment 2 for the MDAs and associated efficiencies. No gamma contamination was found above 200 dpm for I-125 or above 2000 dpm for any other isotope.

The swipes were analyzed for beta contamination, utilizing the Beckman Liquid Scintillation Counter Model 5000 on 28 Jun 93. See Attachment 3 for the MDAs and associated efficiencies. Initial analysis indicated that 6 of the swipes were contaminated. These samples were re-counted and indicated no contamination. It was later discovered that the rubber seal on the sample elevator of the LSC had come off, and that the initial erroneous counts were due to the resulting light leak. No beta contamination was found above 200 dpm for any isotope.

FIXED CONTAMINATION

A fixed gamma survey was conducted on 28 Jun by SPC Brinley. The highest exposure rate found was 17.0 uR/hr. The average exposure rate was approximately 9 uR/hr. See Attachment 4 for the location of readings taken.

A fixed beta survey was conducted on 23 Jul 93 by SPC Brinley. The highest number of counts found during a one minute count-time was 86 cpm. The average number of counts found during a one minute count-time was approximately 50 cpm. See Attachment 5 for the location of readings taken.

As well as being reviewed at the time of the survey/receipt of laboratory results, all pertinent survey data was reviewed and compiled here by SFC Green on 8 Aug 93.

Key **St Decommissioning Survey**

Removable Contamination Survey-Laboratory 23 Scale 1 inch = 4 feet



Key 'est Decommissioning Survey

Removable Contamination Survey-Laboratory 23 Scale 1 inch = 4 feet



Conducted by: <u>SPC Brinley</u> on <u>28 Jun 93</u> Lab analysis by (gamma): <u>SSG Koelker</u> on <u>28 Jun 93</u> (beta) : <u>SSG Koelker</u> on <u>28 Jun 93</u>

on 10011893 Reviewed by:

QUALITY ASSURANCE REPORT - GAMMA FOR DATE: 06/28/93

	BKG	MDA	EFF / ISO
LKB:			
CHANNEL 1:	45 CPM	30.1 DPM	0.733 / I-125
CHANNEL 2:	194 CPM	669.3 DPM	0.068 / CR-51
BECKMAN:			
CHANNEL 1:	N/A	N/A	N/A
CHANNEL 2:	N/A	N/A	N/A

ATTACHMENT 2

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QUALITY ASSURANCE REPORT - BETA FOR DATE: 06/28/93

BECKMAN	L5000TD:	BKG	MDA	EFF / ISO
CHANNEL	1:	32 CPM	29.4 DPM	0.633 / H-3
CHANNEL	2:	28 CPM	18.0 DPM	0.965 / C-14
CHANNEL	3:	26 CPM	N/A	N/A
BECKMAN	LS6800:			
CHANNEL	1:	N/A	N/A	N/A
CHANNEL	2:	N/A	N/A	N/A
CHANNEL	3:	N/A	N/A	N/A

ATTACHMENT 3

Key & st Decommissioning Survey

Fixed Gamma Contamination Survey-Laboratory 23 Scale 1 inch = 4 feet



Conducted by: <u>SPC Brinley</u> on <u>28 Jun 93</u> All Measurements are in uR/hr Reviewed by: <u>Mala K. new on 10 and 23</u>

Key st Decommissioning Survey

Fixed Beta Contamination Survey-Laboratory 23 Scale 1 inch = 4 feet



Reviewed by: on 10 Attachment 5

KEY WEST DECOMMISSIONING SURVEY

Laboratory - 24

REMOVABLE CONTAMINATION

Laboratory Number 24 was surveyed for removable contamination on 24 Jun by SPC Brinley. A total of 195 swipes were taken. See Attachment 1 for the location of each swipe.

The swipes were analyzed for gamma contamination, utilizing the LKB Gammawell Counter on 24 Jun 93. See Attachment 2 for the MDAs and associated efficiencies. No gamma contamination was found above 200 dpm for I-125 or above 2000 dpm for any other isotope.

The swipes were analyzed for beta contamination, utilizing the Beckman Liquid Scintillation Counter Model 5000 on 24 Jun 93. See Attachment 3 for the MDAs and associated efficiencies. No beta contamination was found above 200 dpm for any isotope.

FIXED CONTAMINATION

A fixed gamma survey was conducted on 24 Jun by SPC Brinley. The highest exposure rate found was 21.3 uR/hr. The average exposure rate was approximately 12 uR/hr. See Attachment 4 for the location of readings taken.

A fixed beta survey was conducted on 23 Jul 93 by SPC Brinley. The highest number of counts found during a one minute count-time was 152 cpm. The average number of counts found during a one minute count-time was approximately 60 cpm. See Attachment 5 for the location of readings taken.

As well as being reviewed at the time of the survey/receipt of laboratory results, all pertinent survey data was reviewed and compiled here by SFC Green on 8 Aug 93.

Key V t Decommissioning Survey

Removable Contamination Survey-Laboratory 24 Scale 1 inch = 4 feet



Conducted by: <u>SPC Brinley</u> on <u>24 Jun 93</u> Lab analysis by (gamma): <u>SSG Koelker</u> on <u>24 Jun 93</u> (beta) : <u>SSG Koelker</u> on <u>24 Jun 93</u>

on IOlling 3 Reviewed by:

Key 1 st Decommissioning Survey

Removable Contamination Survey-Laboratory 24 Scale 1 inch = 4 feet



Conducted by: <u>SPC Brinley</u> on <u>24 Jun 93</u> Lab analysis by (gamma): <u>SSG Koelker</u> on <u>24 Jun 93</u> (beta) : <u>SSG Koelker</u> on <u>24 Jun 93</u> Reviewed by: <u>Donald Kneen</u> on <u>10 Aug 23</u>

QUALITY ASSURANCE REPORT - GAMMA FOR DATE: 06/24/93

	BKG	MDA	EFF / ISO
LKB:		· ·	·
CHANNEL 1:	45 CPM	30.1 DPM	0.733 / I-125
CHANNEL 2:	194 CPM	669.3 DPM	0.068 / CR-51
BECKMAN:			
CHANNEL 1:	N/A	N/A	N/A
CHANNEL 2:	N/A	N/A	N/A

ATTACHMENT 2

QUALITY ASSURANCE REPORT - BETA FOR DATE: 06/24/93

BECKMAN L5000TD:	BKG	MDA	EFF / ISO
CHANNEL 1:	21.0 CPM	23.8 DPM	0.627 / H-3
CHANNEL 2:	27.0 CPM	17.7 DPM	0.964 / C-14
CHANNEL 3:	36.0 CPM	N/A	N/A
BECKMAN LS6800:			1
CHANNEL 1:	N/A	N/A	N/A
CHANNEL 2:	N/A	N/A	N/A
CHANNEL 3:	N/A	N/A	N/A

ATTACHMENT 3

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QUALITY ASSURANCE REPORT - BETA FOR DATE: 07/14/93

BECKMAN	L5000TD:	В	KG	MD	A	EFF	1	180
CHANNEL	1:	31	СРМ	28.8	DPM	0.636	1	н-з
CHANNEL	2:	28	СРМ	18.1	DPM	0.962	/	C-14
CHANNEL	3:	25	СРМ	16.5	DPM	1.004	/	P-32
BECKMAN	LS6800:					`		
CHANNEL	1:	33	СРМ	32.4	DPM	0.583	1	H-3
CHANNEL	2:	25	СРМ	17.2	DPM	0.954	1	C-14
CHANNEL	3:	21	СРМ	14.9	DPM	1.011	/	P-32

ATTACHMENT 3

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Ke Vest Decommissioning Survey

Fixed Gamma Contamination Survey-Hallway 6 Scale 1 inch = 4 feet





Fixed Beta Contamination Survey-Hallway 6 Scale 1 inch = 4 feet



Conducted by: <u>SPC Brinley</u> on <u>26 Jul 93</u> All Measurements are Gross Counts in One Minute

93 Reviewed by em 11 on /

KEY WEST DECOMMISSIONING SURVEY

Hallway - 7

REMOVABLE CONTAMINATION

Hallway Number 7 was surveyed for removable contamination on 14 Jul 93 by SPC Brinley. A total of 93 swipes were taken. See Attachment 1 for the location of each swipe.

The swipes were analyzed for gamma contamination, utilizing the LKB Gammawell Counter on 14 Jul 93. See Attachment 2 for the MDAs and associated efficiencies. No gamma contamination was found above 200 dpm for I-125 or above 2000 dpm for any other isotope.

The swipes were analyzed for beta contamination, utilizing the Beckman Liquid Scintillation Counter Model 6800 on 14 Jul 93. See Attachment 3 for the MDAs and associated efficiencies. No beta contamination was found above 200 dpm for any isotope.

FIXED CONTAMINATION

A fixed gamma survey was conducted on 14 Jul 93 by SSG Webster. The highest exposure rate found was 18.3 uR/hr. See Attachment 4 for the location of readings taken.

A fixed beta survey was conducted on 26 Jul 93 by SPC Brinley. The highest number of counts found during a one minute count-time was 88 cpm. The average number of counts found during a one minute count-time was 40 cpm. See Attachment 5 for the location of readings taken.

As well as being reviewed at the time of the survey/receipt of laboratory results, all pertinent survey data was reviewed and compiled here by SFC Green on 9 Aug 93.

Key V It Decommissioning Survey

Removable Contamination Survey-Hallway 7



QUALITY ASSURANCE REPORT - GAMMA FOR DATE: 07/14/93

	BKG	MDA	EFF / ISO
LKB:			•
CHANNEL 1:	49 CPM	30.1 DPM	0.764 / I-125
CHANNEL 2:	197 CPM	676.4 DPM	0.068 / CR-51
BECKMAN:		•	-
CHANNEL 1:	46 CPM	23.0 DPM	0.970 / I-125
CHANNEL 2:	194 CPM	440.0 DPM	0.104 / CR-51

ATTACHMENT 2

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QUALITY ASSURANCE REPORT - BETA FOR DATE: 07/14/93

BECKMAN L	5000TD:	BI	KG	MDZ	A .	EFF	1	ISO
CHANNEL 1	: 3	31 (CPM	28.8	DPM	0.636	1	H-3
CHANNEL 2	: 2	28 (CPM	18.1	DPM	0.962	1	C-14
CHANNEL 3	: 2	25 (CPM	16.5	DPM	1.004	1	P-32
BECKMAN L	<u>86800:</u>							
CHANNEL 1		33 (CPM	32.4	DPM	0.583	./	H-3
CHANNEL 2	: 2	25 0	CPM	17.2	DPM	0.954	1	C-14
CHANNEL 3	: 2	21 0	CPM	14.9	DPM	1.011	1	P-32

ATTACHMENT 3

Ke Vest Decommissioning Survey



Key st Decommissioning Survey



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Attc:hment 5

KEY WEST DECOMMISSIONING SURVEY

Hallway - 8

REMOVABLE CONTAMINATION

Hallway Number 8 was surveyed for removable contamination on 21 Jun (South end) and 30 Jun (North end) 93 by SPC Brinley. A total of 118 swipes were taken. See Attachment 1 for the location of each swipe.

The swipes were analyzed for gamma contamination, utilizing the LKB Gammawell Counter on 21 and 30 Jun 93. See Attachment 2 for the MDAs and associated efficiencies. No gamma contamination was found above 200 dpm for I-125 or above 2000 dpm for any other isotope.

The swipes were analyzed for beta contamination, utilizing the Beckman Liquid Scintillation Counter Model 6800 on 21 and 30 Jun 93. See Attachment 3 for the MDAs and associated efficiencies. No beta contamination was found above 200 dpm for any isotope.

FIXED CONTAMINATION

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A fixed gamma survey was conducted on 21 and 30 Jun 93 by SPC Brinley. The highest exposure rate found was 30.7 uR/hr. See Attachment 4 for the location of readings taken.

A fixed beta survey was conducted on 26 Jul 93 by SPC Brinley. The highest number of counts found during a one minute count-time was 79 cpm. The average number of counts found during a one minute count-time was 40 cpm. See Attachment 5 for the location of readings taken.

As well as being reviewed at the time of the survey/receipt of laboratory results, all pertinent survey data was reviewed and compiled here by SFC Green on 9 Aug 93.
Key West Decommissioning Survey





Conducted by: SPC Brinley on 21 Jun 93 and 30 Jun 93 Lab analysis by (gamma): SSG Koelker on 21 Jun 93 and 30 Jun 93 (beta): SSG Koelker on 21 Jun 93 and 30 Jun 93 93

Attachment 1

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Reviewed by:

Ney were Decommissioning Survey

Remova -- Contamination Survey-Haliway 8 Scale 1 inch = 4 feet



Conducted by: <u>SPC Brinley</u> on <u>21 Jun 93</u> and <u>30 Jun 93</u> Lab analysis by (gamma): <u>SSG Koelker</u> on <u>21 Jun 93</u> and <u>30 Jun 93</u> (beta) : <u>SSG Koelker</u> on <u>21 Jun 93</u> and 30 Jun 93

on IDLIAK T Reviewed by

FOR DATE: 06/21/93						
<u>LKB:</u>	BKG	MDA	EFF / ISO			
CHANNEL 1:	53 CPM	32.2 DPM	0.742 / I-125			
CHANNEL 2:	198 CPM	709.2 DPM	0.065 / CR-51			
BECKMAN:		,				
CHANNEL 1:	52 CPM	22.1 DPM	1.075 / I-125			
CHANNEL 2:	198 CPM	452.3 DPM	0.102 / CR-51			

QUALITY ASSURANCE REPORT - GAMMA

ATTACHMENT 2

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QUALITY ASSURANCE REPORT - GAMMA FOR DATE: 06/30/93

• •	BKG	MDA	EFF / ISO
LKB:			
CHANNEL 1:	53 CPM	32.2 DPM	0.742 / I-125
CHANNEL 2:	198 CPM	709.2 DPM	0.065 / CR-51
BECKMAN:		ı	
CHANNEL 1:	52 CPM	22.1 DPM	1.075 / I-125
CHANNEL 2:	198 CPM	452.3 DPM	0.102 / CR-51

ATTACHMENT 2

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		QUALITY	ASSURANCI	3 REPORT - B 06/21/93	ЕТА
BECKMAN	L5000TD:	Hi)KG	MDA	EFF / ISO
CHANNEL	••	7	I/A	N/A	N/A
CHANNEL	N ••	N	I/A	N/A	N/A
CHANNEL	3	r	I/A	N/A	N/A
BECKMAN	LS6800:				
CHANNEL	••	29	СРМ	28.1 DPM	0.630 / H-3
CHANNEL	N ••	35	СРМ	20.1 DPM	0.968 / C-14
CHANNEL	••	41	СРМ	20.9 DPM	1.007 / P-32

QUALITY ASSURANCE REPORT - BETA FOR DATE: 06/30/93

BECKMAN	L5000TD:	BKG	MDA	EFF / ISO
CHANNEL	1:	N/A	N/A	N/A
CHANNEL	2:	N/A	N/A	N/A
CHANNEL	3:	N/A	N/A	N/A
BECKMAN	LS6800:		· ·	
CHANNEL	1:	17 CPM	23.4 DPM	0.579/H-3
CHANNEL	2:	30 CPM	19.0 DPM	0.947/C-14

40 CPM

20.7 DPM 1.007/P-32

ATTACHMENT 3

CHANNEL 3:

Key West Decommissioning Survey

Fixed Gamma Contamination Survey-Hallway 8 Scale 1 inch = 4 feet



Conducted by: <u>SPC Brinley</u> on <u>21 Jun 93</u> and <u>30 Jun 93</u> All Measurements are in uR/hr

Reviewed by: <u>Under Chen</u> on <u>10/11/53</u>

Key West Decommissioning Survey





Conducted by: <u>SPC Brinley</u> on <u>21 Jun 93</u> and <u>30 Jun 93</u> <u>All Measurements are in uR/hr</u>

Reviewed by: Double Kieme on 10 aug 93



Conducted by: <u>SPC Brinley</u> on <u>26 Jul 93</u> All Measurements are Gross Counts in One Minute

_ on 10 au 93 Reviewed by ann

Attachment 5

Key West Decommissioning Survey

Fixed Beta Contamination Survey-Hallway 8 Scale 1 inch = 4 feet



Conducted by: <u>SFC Brinley</u> on <u>26 Jul 93</u> All Measurements are Gross Counts in One Minute

hear on 10 aug 53 Reviewed by:/ \mathcal{A}

KEY WEST DECOMMISSIONING SURVEY

Hallway - 9

REMOVABLE CONTAMINATION

Hallway Number 9 was surveyed for removable contamination on 30 Jun (South end) and 2 Jul (Mid Section) and 6 Jul (North end) 93 by SPC Brinley. A total of 152 swipes were taken. See Attachment 1 for the location of each swipe.

The swipes were analyzed for gamma contamination, utilizing the LKB Gammawell Counter on 30 Jun, 2 and 6 Jul 93. See Attachment 2 for the MDAs and associated efficiencies. No gamma contamination was found above 200 dpm for I-125 or above 2000 dpm for any other isotope.

The swipes were analyzed for beta contamination, utilizing the Beckman Liquid Scintillation Counter Model 6800 on 30 Jun, 2 and 6 Jul 93. See Attachment 3 for the MDAs and associated efficiencies. No beta contamination was found above 200 dpm for any isotope.

FIXED CONTAMINATION

Fixed gamma surveys were conducted on 30 Jun, 2 and 6 Jul 93 by SSGs Webster and Koelker. The highest exposure rate found was 28.4 uR/hr. See Attachment 4 for the location of readings taken.

A fixed beta survey was conducted on 26 Jul 93 by SPC Brinley. The highest number of counts found during a one minute count-time was 67 cpm. The average number of counts found during a one minute count-time was 45 cpm. See Attachment 5 for the location of readings taken.

As well as being reviewed at the time of the survey/receipt of laboratory results, all pertinent survey data was reviewed and compiled here by SFC Green on 9 Aug 93.



Conducted by: <u>SPC Brinley</u> on <u>30 Jun</u>, <u>02 Jul</u> and <u>06 Jul 93</u> Lab analysis by (gamma): <u>SSG Koelker</u> on <u>30 Jun</u>, <u>02 Jul</u> and <u>06 Jul 93</u> (beta) : <u>SSG Koelker</u> on <u>30 Jun</u>, <u>02 Jul</u> and <u>06 Jul 93</u>

Reviewed by:

Attachment 1

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Conducted by: <u>SPC Brinley</u> on <u>30 Jun</u>, <u>02 Jul</u> and <u>06 Jul 93</u> Lab analysis by (gamma): <u>SSG Koelker</u> on <u>30 Jun</u>, <u>02 Jul</u> and <u>06 Jul 93</u> (beta) : <u>SSG Koelker</u> on <u>30 Jun</u>, <u>02 Jul</u> and <u>06 Jul 93</u>

on 10 aug 93 Reviewed by:

Attachment 1

Key West Decommissioning Survey

Removable Contamination Survey-Hallway 9 Scale 1 inch = 4 feet



Conducted by: <u>SPC Brinley</u> on <u>30 Jun</u>, <u>02 Jul</u> and <u>06 Jul 93</u> Lab analysis by (gamma): <u>SSG Koelker</u> on <u>30 Jun</u>, <u>02 Jul</u> and <u>06 Jul 93</u> (beta) : <u>SSG Koelker</u> on <u>30 Jun</u>, <u>02 Jul</u> and <u>06 Jul 93</u>



QUALITY ASSURANCE REPORT - GAMMA FOR DATE: 06/30/93

	BKG	MDA	EFF / ISO
LKB:			
CHANNEL 1:	53 CPM	32.2 DPM	0.742 / I-125
CHANNEL 2:	198 CPM	709.2 DPM	0.065 / CR-51
BECKMAN:			
CHANNEL 1:	52 CPM	22.1 DPM	1.075 / I-125
CHANNEL 2:	198 CPM	452.3 DPM	0.102 / CR-51

QUALITY ASSURANCE REPORT - GAMMA FOR DATE: 07/02/93

	BKG	MDA	EFF / ISO
LKB:	· · ·		•
CHANNEL 1:	53 CPM	32.2 DPM	0.742 / I-125
CHANNEL 2:	198 CPM	709.2 DPM	0.065 / CR-51
BECKMAN:	· .		· -
CHANNEL 1:	52 CPM	22.1 DPM	1.075 / I-125
CHANNEL 2:	198 CPM	452.3 DPM	0.102 / CR-51

ATTACHMENT 2

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QUALITY ASSURANCE REPORT - GAMMA FOR DATE: 07/06/93

	BKG	MDA	EFF / ISO
LKB:			·
CHANNEL 1:	53 CPM	32.2 DPM	0.742 / I-125
CHANNEL 2:	198 CPM	709.2 DPM	0.065 / CR-51
BECKMAN:		1 	м. Т
CHANNEL 1:	52 CPM	22.1 DPM	1.075 / I-125
CHANNEL 2:	198 CPM	452.3 DPM	0.102 / CR-51

QUALITY ASSURANCE REPORT - BETA FOR DATE: 06/30/93

			BKG	MDA	EFF	1	ISO
BECKMAN	L5000TD:						
CHANNEL	1:		N/A	N/A		N/7	ł
CHANNEL	2:	· . · .	N/A	N/A		N/7	A
CHANNEL	3:		N/A	N/A		N/7	A

BECKMAN LS6800:

CHANNEL	1:	17	CPM	23.4	DPM	0.579/H-3
CHANNEL	2:	30	СРМ	19.0	DPM	0.947/C-14
CHANNEL	3:	40	CPM	20.7	DPM	1.007/P-32

QUALITY ASSURANCE REPORT - BETA FOR DATE: 07/02/93

BECKMAN	L5000TD:	BKG	MDA	EFF / ISO
CHANNEL	1:	N/A	N/A	N/A
CHANNEL	2:	N/A	N/A	N/A
CHANNEL	3:	N/A	N/A	N/A
BECKMAN	<u>LS6800:</u>			
CHANNEL	1:	17 CPM	23.4 DPM	0.579/H-3
CHANNEL	2:	30 CPM	19.0 DPM	0.947/C-14
CHANNEL	3:	40 CPM	20.7 DPM	1.007/P-32

QUALITY ASSURANCE REPORT - BETA FOR DATE: 07/06/93

BECKMAN L5000TD:	BKG	MDA	EFF / ISO
CHANNEL 1:	N/A	N/A	N/A
CHANNEL 2:	N/A	N/A	N/A
CHANNEL 3:	N/A	N/A	N/A
BECKMAN LS6800:			
CHANNEL 1:	39 CPM	36.4 DPM	0.561 / H-3
CHANNEL 2:	26 CPM	17.6 DPM	0.950 / C-14
CHANNEL 3:	24 CPM	16.1 DPM	1.002 / P-32

ATTACHMENT 3

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Attachment 4

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Key st Decommissioning Survey

Fixed Gamma Contamination Survey-Hallway 9 Scale 1 inch = 4 feet



Conducted by: <u>SSG Webster</u> and <u>SSG Koelker</u> on <u>30 Jun</u>, <u>02 Jul</u> and <u>06 Jul 93</u> All Measurements are in uR/hr

on 100 93 Reviewed by: Ulm. 1. N. P. 11

Attachment 4

Fixed Gam...a Contamination Survey-Hallway 9 Scale 1 inch = 4 feet



Conducted by: <u>SSG Webster</u> and <u>SSG Koelker</u> on <u>30 Jun</u>, <u>02 Jul</u> and <u>06 Jul 93</u> All Measurements are in uR/hr

11093 _ on <u>10</u>1 Reviewed by: K

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Attachment 4

Key V st Decommissioning Survey

Fixed Beta Contamination Survey-Hallway 9 Scale 1 inch = 4 feet



Conducted by: <u>SPC Brinley</u> on <u>26 Jul 93</u> All Measurements are Gross Counts in One Minute

Tur 93 Reviewed by: Mon <u>9</u>



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Conducted by: <u>SPC Brinley</u> on <u>26 Jul 93</u> All Measurements are Gross Coupts in One Minute 53 Reviewed by: Un on 10

Fixed Be. Sontamination Survey-Hallway 9 Scale 1 inch = 4 feet



Conducted by: <u>SPC Brinley</u> on <u>26 Jul 93</u> All Measurements are Gross Counts in One Minute

Reviewed by *i3* on /0

KEY WEST DECOMMISSIONING SURVEY

Hallway - 10

REMOVABLE CONTAMINATION

Hallway Number 10 and Closet were surveyed for removable contamination on 14 Jul and 17 Jun 93(respectively) by SPC Brinley. A total of 44 swipes were taken. See Attachment 1 for the location of each swipe.

The swipes were analyzed for gamma contamination, utilizing the LKB Gammawell Counter on 17 Jun and 14 Jul 93. See Attachment 2 for the MDAs and associated efficiencies. No gamma contamination was found above 200 dpm for I-125 or above 2000 dpm for any other isotope.

The swipes were analyzed for beta contamination, utilizing the Beckman Liquid Scintillation Counter Model 6800 on 17 Jun and 14 Jul 93. See Attachment 3 for the MDAs and associated efficiencies. No beta contamination was found above 200 dpm for any isotope.

FIXED CONTAMINATION

Fixed gamma surveys were conducted on 14 Jul 93 by SPC Brinley. The highest exposure rate found was 18.4 uR/hr. See Attachment 4 for the location of readings taken.

A fixed beta survey was conducted on 26 Jul 93 by SPC Brinley. The highest number of counts found during a one minute count-time was 89 cpm. The average number of counts found during a one minute count-time was 60 cpm. See Attachment 5 for the location of readings taken.

As well as being reviewed at the time of the survey/receipt of laboratory results, all pertinent survey data was reviewed and compiled here by SFC Green on 9 Aug 93.

Key st Decommissioning Survey

Removable Contamination Survey-Hallway 10 Scale 1 inch = 4 feet



Conducted by: <u>SPC Brinley</u> on <u>17 Jun 93</u> and <u>14 Jul 93</u> Lab analysis by (gamma): <u>SSG Koelker</u> on <u>17 Jun 93</u> and <u>14 Jul 93</u> (beta): <u>SSG Koelker</u> on <u>17 Jun 93</u> and <u>14 Jul 93</u>

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Attachment 1

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QUALITY ASSURANCE REPORT - GAMMA FOR DATE: 06/17/93

	BKG	MDA	EFF / ISO
LKB:			· ·
CHANNEL 1:	51 CPM	33.2 DPM	0.707 / I-125
CHANNEL 2:	206 CPM	587.0 DPM	0.080 / CR-51
BECKMAN:			
CHANNEL 1:	N/A	N/A	N/A
CHANNEL 2:	N/A	N/A	N/A

QUALITY ASSURANCE REPORT - GAMMA FOR DATE: 07/14/93

	BKG	MDA	EFF / ISO		
LKB:					
CHANNEL 1:	49 CPM	30.1 DPM	0.764 / I-125		
CHANNEL 2:	197 CPM	676.4 DPM	0.068 / CR-51		
BECKMAN:	•				
CHANNEL 1:	46 CPM	23.0 DPM	0.970 / I-125		
CHANNEL 2:	194 CPM	440.0 DPM	0.104 / CR-51		

QUALITY ASSURANCE REPORT - BETA	
FOR DATE: 06/17/93	

BECKMAN L5000TD:	BKG	MDA	EFF / ISO		
CHANNEL 1:	N/A	N/A	N/A		
CHANNEL 2:	N/A	N/A	N/A		
CHANNEL 3:	N/A	N/A	N/A		
BECKMAN LS6800:					
CHANNEL 1:	29 CPM	28.1 DPM	0.630 / H-3		
CHANNEL 2:	35 CPM	20.1 DPM	0.968 / C-14		
CHANNEL 3:	41 CPM	20.9 DPM	1.007 / P-32		

QUALITY ASSURANCE REPORT - BETA FOR DATE: 07/14/93

		BKG		MDA		EFF		ISO
BECKMAN	L5000TD:							
CHANNEL	1:	31	СРМ	28.8	DPM	0.636	1	H-3
CHANNEL	2:	28	CPM	18.1	DPM	0.962	1	C-14
CHANNEL	3:	25	СРМ	16.5	DPM	1.004	/	P-32
BECKMAN	LS6800:							
CHANNEL	1:	33	СРМ	32.4	DPM	0.583	1	H-3
CHANNEL	2:	25	СРМ	17.2	DPM	0.954	1	C-14
CHANNEL	3:	21	CPM	14.9	DPM	1.011	1	P-32







Conducted by: <u>SPC Brinley</u> on <u>14 Jul 93</u>
At Measurements are in uR/hr
Reviewed by Analy Khome on 10 Chur 93



KEY WEST DECOMMISSIONING SURVEY

Hallway - 11

REMOVABLE CONTAMINATION

Hallway Number 11 was surveyed for removable contamination on 2 Jul 93 by SPC Brinley. A total of 90 swipes were taken. See Attachment 1 for the location of each swipe.

The swipes were analyzed for gamma contamination, utilizing the LKB Gammawell Counter on 2 Jul 93. See Attachment 2 for the MDAs and associated efficiencies. No gamma contamination was found above 200 dpm for I-125 or above 2000 dpm for any other isotope.

The swipes were analyzed for beta contamination, utilizing the Beckman Liquid Scintillation Counter Model 6800 on 2 Jul 93. See Attachment 3 for the MDAs and associated efficiencies. No beta contamination was found above 200 dpm for any isotope.

FIXED CONTAMINATION

Fixed gamma surveys were conducted on 2 Jul 93 by SPC Brinley. The highest exposure rate found was 24.4 uR/hr. See Attachment 4 for the location of readings taken.

A fixed beta survey was conducted on 26 Jul 93 by SPC Brinley. The highest number of counts found during a one minute count-time was 48 cpm. The average number of counts found during a one minute count-time was 32 cpm. See Attachment 5 for the location of readings taken.

As well as being reviewed at the time of the survey/receipt of laboratory results, all pertinent survey data was reviewed and compiled here by SFC Green on 9 Aug 93.
Key West Decommissioning Survey

Removable Contamination Survey-Hallway 11 Scale 1 inch = 4 feet



Conducted by: SPC Brinley on 02 Jul 93
Lab analysis by (gamma): SSG Koelker on 02 Jul 93
(beta) : <u>SSG Koelker</u> on <u>02 Jul 93</u>
Reviewed by: mala chem on Dave 43
Attachment 1

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Key West Decommissioning Survey

Removable Contamination Survey-Hallway 11 Scale 1 inch = 4 feet



Conducted by: <u>SPC Brinley</u> on <u>02 Jul 93</u>
Lab analysis by (gamma): SSG Koelker on 02 Jul 93
(beta) : <u>SSG Koelker</u> on <u>02 Jul 93</u>
Reviewed by: mala knew on 10 aur 53
Attachment 1

QUALITY ASSURANCE REPORT - GAMMA FOR DATE: 07/02/93

	BKG	MDA	EFF / ISO
LKB:			•
CHANNEL 1:	53 CPM	32.2 DPM	0.742 / I-125
CHANNEL 2:	198 CPM	709.2 DPM	0.065 / CR-51
BECKMAN:	• •		· · · ·
CHANNEL 1:	52 CPM	22.1 DPM	1.075 / I-125
CHANNEL 2:	198 CPM	452.3 DPM	0.102 / CR-51

ATTACHMENT 2

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QUALITY ASSURANCE REPORT - BETA FOR DATE: 07/02/93

BECKMAN L5000TD:	BKG	MDA	EFF / ISO
CHANNEL 1:	N/A	N/A	N/A
CHANNEL 2:	N/A	N/A	N/A
CHANNEL 3:	N/A	N/A	N/A
BECKMAN LS6800:	• •	. ·	
CHANNEL 1:	17 CPM	23.4 DPM	0.579/H-3
CHANNEL 2:	30 CPM	19.0 DPM	0.947/C-14
CHANNEL 3:	40 CPM	20.7 DPM	1.007/P-32

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Conducted by: <u>SPC Brinley</u> on <u>26 Jul 93</u> All Measurements are Gross Counts in One Minute

<u>493</u> Reviewed by:

Attachment 5

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KEY WEST DECOMMISSIONING SURVEY

Laboratory - 18

REMOVABLE CONTAMINATION

Laboratory Number 18 was surveyed for removable contamination on 16 Jun 93 by SSG Webster. A total of 141 swipes were taken. See Attachment 1 for the location of each swipe.

The swipes were analyzed for gamma contamination, utilizing the LKB Gammawell Counter on 16 Jun 93. See Attachment 2 for the MDAs and associated efficiencies. No gamma contamination was found above 200 dpm for I-125 or above 2000 dpm for any other isotope.

The swipes were analyzed for beta contamination, utilizing the Beckman Liquid Scintillation Counter Model 6800 on 16 Jun 93. See Attachment 3 for the MDAs and associated efficiencies. No beta contamination was found above 200 dpm for any isotope.

FIXED CONTAMINATION

A fixed gamma survey was conducted on 16 Jun 93 by SPC Brinley. The highest exposure rate found was 22.0 uR/hr. The average exposure rate was approximately 11 uR/hr. See Attachment 4 for the location of readings taken.

A fixed beta survey was conducted on 23 Jul 93 by SPC Brinley. The highest number of counts found during a one minute count-time was 102 cpm. The average number of counts found during a one minute count-time was 55 cpm. See Attachment 5 for the location of readings taken.

As well as being reviewed at the time of the survey/receipt of laboratory results, all pertinent survey data was reviewed and compiled here by SFC Green on 8 Aug 93.

Key st Decommissioning Survey

Removable Contamination Survey-Laboratory 18 Scale 1 inch = 4 feet



Conducted by: <u>SSG Webster</u> on <u>16 Jun 93</u> Lab analysis by (gamma): <u>CPT Melanson</u> on <u>16 Jun 93</u> (beta) : <u>CPT Melanson</u> on <u>16 Jun 93</u>

Reviewed by: as on

Attachment 1

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Key est Decommissioning Survey

Removable Contamination Survey-Laboratory 18 Scale 1 inch = 4 feet



QUALITY ASSURANCE REPORT - GAMMA FOR DATE:<u>06/16/93</u>

	BKG	MDA	EFF / ISO
LKB:			•
CHANNEL 1:	48 CPM	29.9 DPM	0.762 / I-125
CHANNEL 2:	201 CPM	576.4 DPM	0.081 / CR-51
BECKMAN:		1	- · .
CHANNEL 1:	N/A	N/A	N/A
CHANNEL 2:	N/A	N/A	N/A

ATTACHMENT 2

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QUALITY ASSURANCE REPORT - BETA For date: <u>06/16/93</u>				
BECKMAN L5000TD:	BKG	MDA	EFF / ISO	
CHANNEL 1:	N/A	N/A	N/A	
CHANNEL 2:	N/A	N/A	N/A	
CHANNEL 3:	N/A	N/A	N/A	
BECKMAN LS6800:				
CHANNEL 1:	29 CPM	28.1 DPM	0.630 / H-3	
CHANNEL 2:	35 CPM	20.1 DPM	0.968 / C-14	
CHANNEL 3:	41 CPM	20.9 DPM	1.007 / P-32	

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ATTACHMENT 3

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Fixed Gamma Contamination Survey-Laboratory 18 Scale 1 inch = 4 feet



Key \ st Decommissioning Survey

Fixed Beta Contamination Survey-Laboratory 18 Scale 1 inch = 4 feet

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KEY WEST DECOMMISSIONING SURVEY

Laboratory - 19

REMOVABLE CONTAMINATION

Laboratory Number 19 was surveyed for removable contamination on 23 Jun 93 by SPC Brinley. A total of 205 swipes were taken. See Attachment 1 for the location of each swipe.

The swipes were analyzed for gamma contamination, utilizing the LKB Gammawell Counter on 23 Jun 93. See Attachment 2 for the MDAs and associated efficiencies. No gamma contamination was found above 200 dpm for I-125 or above 2000 dpm for any other isotope.

The swipes were analyzed for beta contamination, utilizing the Beckman Liquid Scintillation Counter Model 6800 on 23 Jun 93. See Attachment 3 for the MDAs and associated efficiencies. No beta contamination was found above 200 dpm for any isotope.

FIXED CONTAMINATION

A fixed gamma survey was conducted on 23 Jun 93 by SPC Brinley. The highest exposure rate found was 26.1 uR/hr. The average exposure rate was approximately 10.5 uR/hr. See Attachment 4 for the location of readings taken.

A fixed beta survey was conducted on 23 Jul 93 by SPC Brinley. The highest number of counts found during a one minute count-time was 119 cpm. The average number of counts found during a one minute count-time was 60 cpm. See Attachment 5 for the location of readings taken.

As well as being reviewed at the time of the survey/receipt of laboratory results, all pertinent survey data was reviewed and compiled here by SFC Green on 8 Aug 93.





QUALITY ASSURANCE REPORT - GAMMA FOR DATE: 06/23/93

	BKG	MDA	EFF / ISO
LKB:			
CHANNEL 1:	49 CPM	33.4 DPM	0.688 / I-125
CHANNEL 2:	200 CPM	676.8 DPM	0.069 / CR-51
BECKMAN:	· .	· •	
CHANNEL 1:	N/A	N/A	N/A
CHANNEL 2:	N/A	N/A	N/A

ATTACHMENT 2

QUALITY ASSURANCE REPORT - BETA FOR DATE: 06/23/93

BECKMAN L5000TD:	BKG	MDA	EFF / ISO
CHANNEL 1:	N/A	N/A	N/A
CHANNEL 2:	N/A	N/A	N/A
CHANNEL 3:	N/A	N/A	N/A
BECKMAN LS6800:			
CHANNEL 1:	29 CPM	28.1 DPM	0.630 / H-3
CHANNEL 2:	35 CPM	20.1 DPM	0.968 / C-14
CHANNEL 3:	41 CPM	20.9 DPM	1.007 / P-32

ATTACHMENT 3

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KEY WEST DECOMMISSIONING SURVEY

Laboratory - 20

REMOVABLE CONTAMINATION

Laboratory Number 20 was surveyed for removable contamination on 22 Jun 93 by SSG Webster. The walk-in refer adjoining it was surveyed on 25 Jul by SPC Brinley. A total of 76 swipes were taken. See Attachment 1 for the location of each swipe.

The swipes were analyzed for gamma contamination, utilizing the LKB Gammawell Counter on 22 Jun 93. See Attachment 2 for the MDAs and associated efficiencies for the 22 Jun survey. Laboratory analysis for the 25 Jul survey was conducted by the Technical Services Branch, HPO, rather than on-site. The Quality Assurance records for Technical Services is available for inspection at all times. No gamma contamination was found above 200 dpm for I-125 or above 2000 dpm for any other isotope.

The swipes were analyzed for beta contamination, utilizing the Beckman Liquid Scintillation Counter Model 6800 on 22 Jun 93. See Attachment 3 for the MDAs and associated efficiencies. Technical Services Branch also provided the analysis for the beta contamination for the 25 Jul survey. No beta contamination was found above 200 dpm for any isotope.

FIXED CONTAMINATION

A fixed gamma survey was conducted on 22 Jun 93 by SPC Brinley. The highest exposure rate found was 20.7 uR/hr. The average exposure rate was approximately 9.4 uR/hr. See Attachment 4 for the location of readings taken.

A fixed beta survey was conducted on 23 Jul 93 by SPC Brinley. The highest number of counts found during a one minute count-time was 64 cpm. The average number of counts found during a one minute count-time was 50 cpm. See Attachment 5 for the location of readings taken.

As well as being reviewed at the time of the survey/receipt of laboratory results, all pertinent survey data was reviewed and compiled here by SFC Green on 8 Aug 93.

Key st Decommissioning Survey

Removable Contamination Survey-Laboratory 20 Scale 1 inch = 4 feet



Conducted by: <u>SPC Brinley</u> on <u>22 Jun 93</u> Lab analysis by (gamma): <u>SSG Koelker</u> on <u>22 Jun 93</u> (beta) : <u>SSG Koelker</u> on <u>22 Jun 93</u>

Reviewed by Mala Khan. on 10 Aug 93

QUALITY ASSURANCE REPORT - GAMMA FOR DATE: 06/22/93

	BKG	MDA	EFF / ISO
LKB:			
CHANNEL 1:	50 CPM	31.6 DPM	0.735 / I-125
CHANNEL 2:	203 CPM	950.9 DPM	0.049 / CR-51
BECKMAN:			
CHANNEL 1:	N/A	N/A	N/A
CHANNEL 2:	N/A	N/A	N/A

ATTACHMENT 2

QUALITY ASSURANCE REPORT - BETA FOR DATE: 06/22/93

BECKMAN L5000TD:	BKG	MDA	EFF / ISO
CHANNEL 1:	N/A	N/A	N/A
CHANNEL 2:	N/A	N/A	N/A
CHANNEL 3:	N/A	Ň/A	N/A
BECKMAN LS6800:			
CHANNEL 1:	29 CPM	28.1 DPM	0.630 / H-3
CHANNEL 2:	35 CPM	20.1 DPM	0.968 / C-14
CHANNEL 3:	41 CPM	20.9 DPM	1.007 / P-32

ATTACHMENT 3

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Fixed Gamma Contamination Survey-Laboratory 20 Scale 1 inch = 4 feet



Conducted by: SPC Brinley on 22 Jun 93 All Measurements are in uR/hr Reviewed by €⁄ <u>2010</u> on <u>//</u>

Key est Decommissioning Survey

Fixed Beta Contamination Survey-Laboratory 20 Scale 1 inch = 4 feet



KEY WEST DECOMMISSIONING SURVEY

Laboratory - 21

REMOVABLE CONTAMINATION

Laboratory Number 21 was surveyed for removable contamination on 30 Jun 93 by SPC Brinley. A total of 105 swipes were taken. See Attachment 1 for the location of each swipe.

The swipes were analyzed for gamma contamination, utilizing the LKB Gammawell Counter on 30 Jun 93. See Attachment 2 for the MDAs and associated efficiencies. No gamma contamination was found above 200 dpm for I-125 or above 2000 dpm for any other isotope.

The swipes were analyzed for beta contamination, utilizing the Beckman Liquid Scintillation Counter Model 6800 on 30 Jun 93. See Attachment 3 for the MDAs and associated efficiencies. No beta contamination was found above 200 dpm for any isotope.

FIXED CONTAMINATION

A fixed gamma survey was conducted on 30 Jun 93 by SPC Brinley. The highest exposure rate found was 22.2 uR/hr. The average exposure rate was approximately 9 uR/hr. See Attachment 4 for the location of readings taken.

A fixed beta survey was conducted on 23 Jul 93 by SPC Brinley. The highest number of counts found during a one minute count-time was 169 cpm. The average number of counts found during a one minute count-time was approximately 80 cpm. See Attachment 5 for the location of readings taken.

As well as being reviewed at the time of the survey/receipt of laboratory results, all pertinent survey data was reviewed and compiled here by SFC Green on 8 Aug 93.

Key V st Decommissioning Survey

Removable Contamination Survey-Laboratory 21 Scale 1 inch = 4 feet



Conducted by: <u>SPC Brinley</u> on <u>30 Jun 93</u> Lab analysis by (gamma): <u>SSG Koelker</u> on <u>30 Jun 93</u> (beta) : <u>SSG Koelker</u> on <u>30 Jun 93</u>

Reviewed by: Dould & Chain, on 10 aug 93

Key st Decommissioning Survey

Removable Contamination Survey-Laboratory 21 Scale 1 inch = 4 feet



Attachment 1

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QUALITY ASSURANCE REPORT - GAMMA FOR DATE: 06/30/93

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	BKG	MDA	EFF / ISO
LKB:	· . ·		
CHANNEL 1:	54 CPM	45.5 DPM	0.530 / I-125
CHANNEL 2:	204 CPM	948.4 DPM	0.050 / CR-51
BECKMAN:	· ·	а. — Ч 	
CHANNEL 1:	N/A	N/A	N/A
CHANNEL 2:	N/A	N/A	N/A

ATTACHMENT 2

QUALITY ASSURANCE REPORT - BETA FOR DATE: 06/30/93

BECKMAN	L5000TD:	BKG	MDA	EFF / ISO
CHANNEL	1:	N/A	N/A	N/A
CHANNEL	2:	N/A	N/A	N/A
CHANNEL	3:	N/A	N/A	N/A
BECKMAN	LS6800:			
CHANNEL	1:	17 CPM	23.4 DPM	0.579/H-3
CHANNEL	2:	30 CPM	19.0 DPM	0.947/C-14
CHANNEL	3:	40 CPM	20.7 DPM	1.007/P-32

ATTACHMENT 3

Key W L Decommissioning Survey

Fixed Gamma Contamination Survey-Laboratory 21 Scale 1 inch = 4 feet



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Conducted by: SPC Brinley on 23 Jul 93 All Measurements are Gross One Minute Counts

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17'1.0625'

Reviewed by 2001 on 10 aug 93

Attachment 5

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KEY WEST DECOMMISSIONING SURVEY

Laboratory - 22

REMOVABLE CONTAMINATION

Laboratory Number 22 was surveyed for removable contamination on 9 Jul by SSG Koelker. A total of 149 swipes were taken. See Attachment 1 for the location of each swipe.

The swipes were analyzed for gamma contamination, utilizing the LKB Gammawell Counter on 12 Jul 93. See Attachment 2 for the MDAs and associated efficiencies. No gamma contamination was found above 200 dpm for I-125 or above 2000 dpm for any other isotope.

The swipes were analyzed for beta contamination, utilizing the Beckman Liquid Scintillation Counter Model 6800 on 12 Jul 93. See Attachment 3 for the MDAs and associated efficiencies. No beta contamination was found above 200 dpm for any isotope.

FIXED CONTAMINATION

A fixed gamma survey was conducted on 9 Jul by SSG Koelker. The highest exposure rate found was 20.1 uR/hr. The average exposure rate was approximately 8 uR/hr. See Attachment 4 for the location of readings taken.

A fixed beta survey was conducted on 23 Jul 93 by SPC Brinley. The highest number of counts found during a one minute count-time was 87 cpm. The average number of counts found during a one minute count-time was approximately 50 cpm. See Attachment 5 for the location of readings taken.

As well as being reviewed at the time of the survey/receipt of laboratory results, all pertinent survey data was reviewed and compiled here by SFC Green on 8 Aug 93.
Key V t Decommissioning Survey





Attachment 1

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Key **St Decommissioning Survey**

Removable Contamination Survey-Laboratory 22 Scale 1 inch = 4 feet



Conducted by: <u>SSG Koelker</u> on <u>09 Jul 93</u> Lab analysis by (gamma): <u>SSG Koelker</u> on <u>12 Jul 93</u> (beta) : <u>SSG Koelker</u> on <u>12 Jul 93</u> Reviewed by: <u>mail K cheen</u>, on <u>10 Aug 93</u>

Attachment 1

QUALITY ASSURANCE REPORT - GAMMA FOR DATE: 07/12/93

	BKG	MDA	EFF / ISO
LKB:			•
CHANNEL 1:	52 CPM	30.9 DPM	0.767 / I-125
CHANNEL 2:	197 CPM	679.7 DPM	0.068 / CR-51
BECKMAN:			
CHANNEL 1:	48 CPM	25.0 DPM	0.912 / I-125
CHANNEL 2:	205 CPM	490.2 DPM	0.096 / CR-51

ATTACHMENT 2 .

QUALITY ASSURANCE REPORT - BETA FOR DATE: 07/12/93

 $\left(\begin{array}{c} \\ \end{array} \right) < \cdot$

	BKG	MDA	EFF / ISO
BECKMAN L5000TD:			
CHANNEL 1:	N/A	N/A	N/A
CHANNEL 2:	N/A	N/A	N/A
CHANNEL 3:	N/A	N/A	N/A
BECKMAN LS6800:			
CHANNEL 1:	17 CPM	23.4 DPM	0.579/H-3
CHANNEL 2:	30 CPM	19.0 DPM	0.947/C-14
CHANNEL 3:	40 CPM	20.7 DPM	1.007/P-32

ATTACHMENT 3

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Conducted by: <u>SSG Koelker</u> on <u>09 Jul 93</u> All Measurements are in uR/hr

Reviewed by: 2000 n /

Attachment 4



Conducted by: <u>SPC Brinley</u> on <u>23 Jul 93</u> All Measurements are Gross One Minute Counts

Reviewed by: 10/11992

Attachment 5

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KEY WEST DECOMMISSIONING SURVEY

Laboratory - 23

REMOVABLE CONTAMINATION

Laboratory Number 23 was surveyed for removable contamination on 28 Jun by SPC Brinley. A total of 124 swipes were taken. See Attachment 1 for the location of each swipe.

The swipes were analyzed for gamma contamination, utilizing the LKB Gammawell Counter on 28 Jun 93. See Attachment 2 for the MDAs and associated efficiencies. No gamma contamination was found above 200 dpm for I-125 or above 2000 dpm for any other isotope.

The swipes were analyzed for beta contamination, utilizing the Beckman Liquid Scintillation Counter Model 5000 on 28 Jun 93. See Attachment 3 for the MDAs and associated efficiencies. Initial analysis indicated that 6 of the swipes were contaminated. These samples were re-counted and indicated no contamination. It was later discovered that the rubber seal on the sample elevator of the LSC had come off, and that the initial erroneous counts were due to the resulting light leak. No beta contamination was found above 200 dpm for any isotope.

FIXED CONTAMINATION

A fixed gamma survey was conducted on 28 Jun by SPC Brinley. The highest exposure rate found was 17.0 uR/hr. The average exposure rate was approximately 9 uR/hr. See Attachment 4 for the location of readings taken.

A fixed beta survey was conducted on 23 Jul 93 by SPC Brinley. The highest number of counts found during a one minute count-time was 86 cpm. The average number of counts found during a one minute count-time was approximately 50 cpm. See Attachment 5 for the location of readings taken.

As well as being reviewed at the time of the survey/receipt of laboratory results, all pertinent survey data was reviewed and compiled here by SFC Green on 8 Aug 93.

Key **Mast Decommissioning Survey**

Removable Contamination Survey-Laboratory 23 Scale 1 inch = 4 feet



Conducted by: <u>SPC Brinley</u> on <u>28 Jun 93</u> Lab analysis by (gamma): <u>SSG Koelker</u> on <u>28 Jun 93</u> (beta) : <u>SSG Koelker</u> on <u>28 Jun 93</u>

Reviewed by: <u>ren on 10</u>

Attachment 1

Key est Decommissioning Survey

Removable Contamination Survey-Laboratory 23 Scale 1 inch = 4 feet



Conducted by: <u>SPC Brinley</u> on <u>28 Jun 93</u> Lab analysis by (gamma): <u>SSG Koelker</u> on <u>28 Jun 93</u> (beta) : <u>SSG Koelker</u> on <u>28 Jun 93</u>

Reviewed by: e93 on /U

Attachment 1

QUALITY ASSURANCE REPORT - GAMMA FOR DATE: 06/28/93

	BKG	MDA	EFF / ISO
LKB:		• •	· •
CHANNEL 1:	45 CPM	30.1 DPM	0.733 / I-125
CHANNEL 2:	194 CPM	669.3 DPM	0.068 / CR-51
BECKMAN:		н 	
CHANNEL 1:	N/A	N/A	N/A
CHANNEL 2:	N/A	N/A	N/A

ATTACHMENT 2

St. Carlo

QUALITY ASSURANCE REPORT - BETA FOR DATE:<u>06/28/93</u>

•	BKG	MDA	EFF / ISO
BECKMAN L5000TD:		· · · · ·	
CHANNEL 1:	32 CPM	29.4 DPM	0.633 / H-3
CHANNEL 2:	28 CPM	18.0 DPM	0.965 / C-14
CHANNEL 3:	26 CPM	N/A	N/A
BECKMAN LS6800:	·.		
CHANNEL 1:	N/A	N/A	N/A
CHANNEL 2:	N/A	N/A	N/A
CHANNEL 3:	N/A	N/A	N/A

ATTACHMENT 3

. 4





Conducted by: SPC Brinley on 28 Jun 93 All Measurements, are in uR/hr 200 ... on 11 Reviewed by

Attachment 4

Key st Decommissioning Survey

Fixed Beta Contamination Survey-Laboratory 23 Scale 1 inch = 4 feet



1093 Reviewed by _ on *10* lon

Attachment 5

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KEY WEST DECOMMISSIONING SURVEY

Laboratory - 24

REMOVABLE CONTAMINATION

Laboratory Number 24 was surveyed for removable contamination on 24 Jun by SPC Brinley. A total of 195 swipes were taken. See Attachment 1 for the location of each swipe.

The swipes were analyzed for gamma contamination, utilizing the LKB Gammawell Counter on 24 Jun 93. See Attachment 2 for the MDAs and associated efficiencies. No gamma contamination was found above 200 dpm for I-125 or above 2000 dpm for any other isotope.

The swipes were analyzed for beta contamination, utilizing the Beckman Liquid Scintillation Counter Model 5000 on 24 Jun 93. See Attachment 3 for the MDAs and associated efficiencies. No beta contamination was found above 200 dpm for any isotope.

FIXED CONTAMINATION

A fixed gamma survey was conducted on 24 Jun by SPC Brinley. The highest exposure rate found was 21.3 uR/hr. The average exposure rate was approximately 12 uR/hr. See Attachment 4 for the location of readings taken.

A fixed beta survey was conducted on 23 Jul 93 by SPC Brinley. The highest number of counts found during a one minute count-time was 152 cpm. The average number of counts found during a one minute count-time was approximately 60 cpm. See Attachment 5 for the location of readings taken.

As well as being reviewed at the time of the survey/receipt of laboratory results, all pertinent survey data was reviewed and compiled here by SFC Green on 8 Aug 93.

Key V t Decommissioning Survey

Removable Contamination Survey-Laboratory 24 Scale 1 inch = 4 feet



Conducted by: SPC Brinley on 24 Jun 93 Lab analysis by (gamma): SSG Koelker on 24 Jun 93 (beta) : SSG Koelker on 24 Jun 93 193 Reviewed by: con on ///

Attachment 1

Key V st Decommissioning Survey

Removable Contamination Survey-Laboratory 24 Scale 1 inch = 4 feet



Conducted by: <u>SPC Brinley</u> on <u>24 Jun 93</u> Lab analysis by (gamma): <u>SSG Koelker</u> on <u>24 Jun 93</u> (beta) : <u>SSG Koelker</u> on <u>24 Jun 93</u> Reviewed by: <u>Denald Kheen</u> on <u>10 Aug 23</u>

Attachment 1

QUALITY ASSURANCE REPORT - GAMMA FOR DATE: 06/24/93

	BKG	MDA	EFF / ISO
LKB:		•	
CHANNEL 1:	45 CPM	30.1 DPM	0.733 / I-125
CHANNEL 2:	194 CPM	669.3 DPM	0.068 / CR-51
BECKMAN:	· · · · ·		•
CHANNEL 1:	N/A	N/A	N/A
CHANNEL 2:	N/A	N/A	N/A

ATTACHMENT 2

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QUALITY ASSURANCE REPORT - BETA FOR DATE: 06/24/93

BECKMAN L5000TD:	BKG	MDA	EFF / ISO
CHANNEL 1:	21.0 CPM	23.8 DPM	0.627 / H-3
CHANNEL 2:	27.0 CPM	17.7 DPM	0.964 / C-14
CHANNEL 3:	36.0 CPM	N/A	N/A
BECKMAN LS6800:		• •	
CHANNEL 1:	N/A	N/A	N/A
CHANNEL 2:	N/A	N/A	N/A
CHANNEL 3:	N/A	N/A	N/A

ATTACHMENT 3

				<u> 4</u> .	
(19-89) ·	U.S. NUCLEAR REGL	LATORY COMMISSION	PAGE	OF	P <i>A</i>
	MATERIA	LS LICENSE	Amendment	No. 65	
Pursuant to the Atomic Energy Act of Code of Federal Regulations, Chapter I, made by the licensee, a license is hereby nuclear material designated below; to use to persons authorized to receive it in acco specified in Section 183 of the Atomic En Regulatory Commission now or hereafte	f 1954, as amended, the En Parts 30, 31, 32, 33, 34, 35, 3 issued authorizing the licensed such material for the purposed rdance with the regulations of the ergy Act of 1954, as amended, r in effect and to any condition	ergy Reorganization Act of 9, 40 and 70, and in reliance to receive, acquire, posses s) and at the place(s) designance applicable Part(s). This lic and is subject to all applicab ns specified below.	of 1974 (Public Law e on statements and rep s, and transfer byprodu- ted below; to deliver of ense shall be deemed t le rules, regulations an	93-438), and presentations h uct, source, and r transfer such o contain the o d orders of th	l Title neretof nd spea h mate condition e Nucl
Licensee		1		<u> </u>	
 Department of the Army Walter Reed Army Medica 	1 Center (WRAMC)	In accordance February 28, 3 3. License number 08 its entirety	with the lett 1994, 3-01738-02 is to read as fol	er dated amended lows:	in
2. Washington, D.C. 20307	-5001			/ F	
		5. Docket or	0 01217	LXTENDE	ı)
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special nuclear material	form	afor physical	may possess a	t any one tin	-11266 16
 A. Any byproduct material atomic numbers 1-83 B. Iodine 131 	with A. Any B. Any		A. 400 milli radionucl possessio curies B. 2 cu ries	curies of ide with n limit o	fead ato of20
C. Xenon 133 D. Krypton 85 E. Gold 198 E. Phosphorus 32	D. Any E. Any E. Any		C. 2 curies D. 1 curie E. 1 curie		•
G. Carbon 14	G. Any H. Any		G. 2 curies H.21 curie		
I. Iridium 192 J. Chromium 51	J. Any J.		J. 750 milli	curies	
K. Sulfur 35 L. Hydrogen 3	`∦ K. Any L.¥Anv ⊿		K. I curie L. 5 curies		
M. Molybdenum 99	M. Molybden Techneti Generato	um 99 / um 99m	M. 23 curies		
N. Technetium 99m O. Strontium 90 P. Cesium 137	N. Any O. Sealed s P. Sealed s	ources ources	N23 curies O. P.		
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		ing#			L

NRC Form 374A U.S. NUL CAR REGULATORY COMMISSION 2 OF PAGE PAGES (5-84) License number 08-01738-02 MATERIALS LICENSE Docket or Reference number SUPPLEMENTARY SHEET 030-01317 Amendment No. 65 (Items 6., 7. & 8. continued) 7. Chemical and/or physical 8. Maximum amount that 6. Byproduct, source, and/or special nuclear material licensee may possess at form any one time under this license U. Cesium 137 U. Sealed sources V. Sealed sources V. Cobalt 60 W. Americium 241 W. Any W. 100 microcuries Sealed sources Χ. X. Americium 241 Y. Sealed sources and foils XY. 1 curie Y. Nickel 63 Z. Iodine 129 Z. Sealed sources Z) 1 curie AA3 5 kilograms AA. Any AA. Thorium BB. 50 kilograms CC: 400 kilograms **BB.** Uranium **BB. Anv** GC Plated Metal CC. Uranium depleted in Uranium 235 DD. Americium 241 DD Seal ed sources EESEaled /source EE. Cesium 137 EE FF. Cesium 137 9. Authorized use Medical research, diagnosis, and therapy, research and development as defined in 10 CFR 30.4. A. through T. as defined in 10 CFR 30.4. Research and development as defined in 10 GFB 30.4; teaching. U. through Z. Teaching and laboratory research. AA. and BB. CC. Shielding. DD. Standards and reference sources. \for calibration of EE. In an\ instruments. FF. Instrument calibration. CONDITIONS 10. Location of use: Walter Reed Army Medical Center, Washington, D. C.; WRAMC Forest Glen Section and Annex, Silver Spring, Maryland; Walter Reed Army Institute of Research Animal Holding Facility, Fort Meade, Maryland; U.S. Army Medical Laboratory, WRAMC Department of Pathology, Fort Meade, Maryland; and U.S. Army Institute of Dental Research Facility, Fort Meade, Maryland; Rickman Building, 13 Taft Court, Rockville, Maryland and Gillette Building, 270 Research Center, 1413 Research Boulevard, Rockville, Maryland. 11. Radiation Safety Officer: CPT Mark A. Melanson, CHP.

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NRC	Forra 374	U.S. NL	AR REGULATORY COMMIS	SION	PAGE 3	OF 4	PAGES
		·		License number	00 01720	0.2	
		MATERIALS LIC	CENSE	Docket or Refere	ence number	-02	
		SUPPLEMENTARY	SUFFI		030-01317	·	
					Amendment	No. 65	
	,						
(Con	tinue	d)	CONDITIONS				
12.	Α.	Licensed material sl designated by the l Chairman.	nall be used by, or icensee's Radiation	under the supe Safety Commits	ervision of, tee, Col. Joa	individua n T. Zajt	lls chuk,
	Β.	The use of licensed in Section 35.2 of 1	material in or on H 10 CFR Part 35.	humans shall be	e by a physic	ian as de	fined
	C.	Physicians designate training criteria es	ed to use licensed r stablished in 10 CF	naterial in or Part 35, Subr	on humans sh bart J.	all meet	the
13.	Expe used	rimental animals admi for human consumptio	inistered licensed m	naterials of th	neir products	shall no	t bê
14.	Dete only whic	ctor cells containing be used in conjunct h prevents foi l/temp e	a titanium tritide on with'a properly eratures from exceed	e foil or a sca operating temp ling that speci	andjum tritid perature cont ified by the	e foil sh rol mecha manufactu	all nism rer.
15.	Notw for i Admin Drug	ithstanding the requinedical use any bypronistration has accept (IND).	irements of 10 CFR 3 oduct material or re ed a Notice of Cla	15.49 agent KiB for Limed Investiga	(b), the lice which the Fo ational Exemp	nsee may od and Dr tion for	use ug a New
16.	The 10 C	licensee may transpor FR 71, "Packaging and	Densed materia Pansportat on pr	Hin accordance Radioact ve Ma	e with the pr aterial."	ovisions	of
17.	If or limi NURE each divio Limi	nly a single radionuc t is the quantity spe G-0767. If two or mo is determined as fol ded by the quantities ting <u>Possession</u> <u>Limit</u>	cified in <u>Schedule</u> fre radionuclides ar lows: the sum of t of those radionucl s, NUREG-0767 shall	WREG 9767, is of Limiting Por re possessed the quotients of ides specified not exceed un	possessed, t <u>ssession</u> Lim he possessio of the quanti l in the <u>Sche</u> nity.	he posses its, n limit f ties poss <u>dule of</u>	sion or essed
18.	The less	licensee is authorize than 90 days for dec	ed to hold radioacti cay-in-storage befor	ve material wi e disposal in	th a physica ordinary tra	l half-li sh provid	fe of ed:
	Α.	Radioactive waste to minimum of 10 half-1	be disposed of in ives.	this manner sh	all be held	for decay	a
	Β.	Before disposal as n determine that its r All radiation labels	ormal waste, radioa adioactivity cannot shall be removed o	active waste sh be distinguis pr obliterated.	all be surve hed from bac	yed to kground.	
	C.	Generator columns sh to ensure decay to b	all be segregated s ackground levels pr	o that they ma ior to disposa	y be monitor 1.	ed separa	tely
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NRC F (5-84)	orm 374A	U.S. N	IL EAR REGULAT	ORY COMMISSION	License number	PAGE	4 OF	4 p	AGE
1	· ·	MATERIALS	LICENSE			08-01	738-02		
	· .	SUPPLEMENTA	RY SHEET		Docket or Refer	ence number	1917		
						030-0	1317	·	
				<u></u>		Amend	ment No.	65	
(Con	tinued)		CONDITIONS	5					
19.	Except a its prog containe Regulato represen more res	is specifically ram in accorda d in the docum ry Commission' itations and pr strictive than	provided oth nce with the ents, includi s regulations ocedures in t the regulatic	nerwise in t statements, ing any enclo s shall gover the licensee ons.	his license representa osures, lis rn unless t 's applicat	, the lic tions, an ted below he statem ion and c	ensee sh d proced . The N ents, orrespon	all con ures uclear dence a	duc re
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			<u></u>	Nucl	ear Materi	als Safety	Branch		

APR 1 5 1994

License No. 08-01738-02 Docket No. 030-01317 Control No. 119389

Department of the Army ATTN: Peter H. Myers, Lt. Colonel HQDA (DASG-PSP) 5109 Leesburg Pike Falls Church, Virgina 22041-3258

Dear Lt. Colonel:

Please review the enclosed document carefully and be sure that you understand all conditions. If there are any errors or questions, please notify the U.S. Nuclear Regulatory Commission, Region I office, the Licensing Assistance Section, (610) 337-5093 or 5239, so that we can provide appropriate corrections and answers.

Please be advised that your license expires at the end of the day, in the month, and year stated in the license. Until your license is terminated, you must conduct your program involving byproduct materials in accordance with the conditions of your NRC license, representations made in your license application, and NRC regulations. In particular, note that you must:

1. Operate in accordance with NRC regulations 10 CFR Part 19, "Notices, Instructions and Reports to Workers; Inspections," 10 CFR Part 20, "Standards for Protection Against Radiation," and other applicable regulations.

2. Notify NRC, in writing, within 30 days:

- a. when the licensee's mailing address changes (no fee is required if the location of byproduct material remains the same).
- 3. In accordance with 10 CFR 30.36(b) and/or license condition, notify NRC, promptly, in writing, and request termination of the license:
 - a. when you decide to terminate all activities involving materials authorized under the license; or

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Department of the Army

- b. if you decide not to complete the facility, acquire equipment, or possess and use authorized material.
- 4. Request and obtain a license amendment before you:
 - a. change Radiation Safety Officers;
 - b. order byproduct material in excess of the amount, or radionuclide, or form different than authorized on the license;
 - c. add or change the areas of use, or address or addresses of use identified in the license application or on the license; or
 - d. change ownership of your organization.
- 5. Submit a complete renewal application with proper fee or termination request at least 30 days before the expiration date of your license. You will receive a reminder notice approximately 90 days before the expiration date. Possession of byproduct material after your license expires is a violation of NRC regulations. A license will not normally be renewed, except on a case-by-case basis, in instances where licensed material has never been possessed or used.

In addition, please note that NRC Form 313 requires the applicant, by his/her signature, to verify that the applicant understands that all statements contained in the application are true and correct to the best of the applicant's knowledge. The signatory for the application should be the licensee or certifying official rather than a consultant.

You will be periodically inspected by the NRC. Failure to conduct your program in accordance with NRC regulations, license conditions, and representations made in your license application and supplemental correspondence with NRC will result in enforcement action against you. This could include issuance of a notice of violation, or imposition of a civil penalty, or an order suspending, modifying or revoking your license as specified in the General Policy and Procedures for NRC Enforcement Actions, 10 CFR Part 2, Appendix C.

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Department of the Army

-3-

Since serious consequences to employees and the public can result from failure to comply with NRC requirements, prompt and vigorous enforcement action will be taken when dealing with licensees who do not achieve the necessary meticulous attention to detail and the high standard of compliance which NRC expects of its licensees.

Thank you for your cooperation.

Sincerely,

Original organd By: Thomas K. Thompson

Thomas K. Thompson Senior Health Physicist Nuclear Materials Safety Branch Division of Radiation Safety and Safeguards

Enclosures:

1. Amendment No. 65

2. Requirements for Materials Licensees



4//1 /94

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DEPARTMENT OF THE ARMY OFFICE OF THE SURGEON GENERAL 5109 LEESBURG PIKE FALLS CHURCH, VA 22041-3258

February 28, 1994



030-01317

REPLY TO ATTENTION OF

Preventive Medicine Consultants Division

US Nuclear Regulatory Commission Region I 475 Allendale King of Prussia, Pennsylvania 19406

Dear Sir:

Enclosed are two copies of a request to amend Byproduct Material License Number 08-01738-02, Walter Reed Army Medical Center, Washington, DC, by appointing Captain Mark A. Melanson as Radiation Safety Officer.

Recommend approval.

Sincerely,

Peter H. Myers Colonel, U.S. Army Radiological Hygiene Consultant

Enclosure.

CF: HQ, USAEHA, ATTN: HSHB-MR-H, APG, MD 21010-5422 HQ, USWRAMC, ATTN: HSHL-HP, Wash, DC 20307-5001

FEE EXEMPT

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19389-ML 10 7 1994



DEPARTMENT OF THE ARMY WALTER REED ARMY MEDICAL CENTER WASHINGTON, DC 20307-5001



HSHL-HP (385-11m)

17 February 1994

MEMORANDUM FOR U.S. Nuclear Regulatory Commission, Region I, Nuclear Material Safety Section A, 475 Allendale Road, King of Prussia, PA 19406

SUBJECT: Amendment of U.S. Nuclear Regulatory Commission License No. 08-01738-02.

1. Request that NRC License No. 08-01738-02 for Walter Reed Army Medical Center be amended to reflect a change in the Radiation Safety Officer from LTC Arthur G. Samiljan to CPT Mark A. Melanson, CHP. CPT Melanson has been assigned as the Chief, Health Physics Office at Walter Reed AMC since February 1994. Before that he was the Chief, Operations Branch of the Health Physics Office and alternate RSO at WRAMC since June 1991. A Training and Experience Form and a Curriculum Vitae for CPT Melanson are attached (Enclosures 1 and 2).

2. If any additional information is required please contact Mr. David Burton or CPT Melanson at (301) 427-5161.

FOR THE COMMANDER:

2 Encls

EARL S. NEWSOME III LTC, MS Executive Officer

CF: CDR, HSC ATTN: HSCL-P HQDA (SGPS-PSP-E)

030-013/1

DEPARTMENT OF THE ARMY

WALTER REED ARMY MEDICAL CENTER WASHINGTON, DC 20307-5001



K-8

REPLY TO ATTENTION OF:

HSHL-HP (385-11m)

17 February 1994 ms-16

MEMORANDUM FOR U.S. Nuclear Regulatory Commission, Region I, Nuclear Material Safety Section A, 475 Allendale Road, King of Prussia, PA 19406

SUBJECT: Amendment of U.S. Nuclear Regulatory Commission License No. 08-01738-02.

1. Request that NRC License No. 08-01738-02 for Walter Reed Army Medical Center be amended to reflect a change in the Radiation Safety Officer from LTC Arthur G. Samiljan to CPT Mark A. Melanson, CHP. CPT Melanson has been assigned as the Chief, Health Physics Office at Walter Reed AMC since February 1994. Before that he was the Chief, Operations Branch of the Health Physics Office and alternate RSO at WRAMC since June 1991. A Training and Experience Form and a Curriculum Vitae for CPT Melanson are attached (Enclosures 1 and 2).

2. If any additional information is required please contact Mr. David Burton or CPT Melanson at (301) 427-5161.

FOR THE COMMANDER:

2 Encls

Enl & Newson

Recontrolled 119389 Deficiency response 112749

FEB 24 1994

EARL S. NEWSOME III LTC, MS Executive Officer

CF: CDR, HSC ATTN: HSCL-P HQDA (SGPS-PSP-E)

'94 FEB 24 A9 51

OFFICIAL RECORD COPY ML 10

CURRICULUM VITAE OF MARK ALLEN MELANSON

PERSONAL DATA:

HOME ADDRESS:

SSN:

CITIZENSHIP:

MARITAL STATUS:

EDUCATION:

COLLEGE:

GRADUATE SCHOOL:

CERTIFICATION:

EXPERIENCE:

OCT 83 - DEC 86

DEC 86 - DEC 88

Dickinson College, Carlisle, PA B.S. Nuclear Physics, Mathematics

Johns Hopkins University School of Hygiene and Public Health <u>M.S. Radiological</u> Health

Comprehensive, American Board of Health Physics

Radiation Safety Officer and Medical Physicist Department of Radiology Landstuhl Army Regional Medical Center, Landstuhl, West Germany 4 Mammographic x-ray systems

Consultant, Medical Physics Medical Physics Branch Health Physics Division US Army Environmental Hygiene Agency Aberdeen Proving Grounds, MD 40 Mammographic x-ray systems

JUN 91 - PRESENT

Deputy Health Physics Officer Walter Reed Army Medical Center Washington, D.C. 10 Mammographic x-ray systems

Societies and Affiliations:

American Association of Physicists in Medicine American Academy of Health Physics Health Physics Society Sigma Pi Sigma Physics Honor Society Delta Omega Public Health Honor Society Theta Chi Fraternity

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6. EXPER	ENCE WITH RADIATION (Actual use of Radio	sofopes) (Sealed or unsealed source	,
ISOTOPE MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
I-131 200 mCi Tc-99m 50 mCi Cs-139 25 mCi Tl-201 75 mCi Ba-133 500 mCi	LARMC, FRG LARMC, FRG U " "	9/83 - 12/86 9/82 - 12/86 """""	Therapy Imaging Calibration Imaging Pa+ Ma ke
Co-57 Co-58 Ga-67 In-111 500 mCi I-123 500 mCi	LARMC FRG	9/83 - 12/86 """"""	Calibration Imaging """
C-11 2 Ci F-18 500 mCi Ra-226 50 mCi H-3 2 Ci	JHU II II AEHA	7/89 - 5/91 """ 12/86 - 12/88	Imaging Lab Special Project
and the state of the	ERIENCE WITH RADIATION PRODUCING DE	VICES (X-ray, Irradiators, etc.)	1944 - 1946 - 1946 - 194
DEVICE	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
Neutron Howitzer Pu-239 Be Diagnostic X-Ray Systems Diagnostic X-Ray Systems	Dickinson College MHPS, HPD, AEHA LARMC	9/79 - 5/83 12/86 - 12/88 9/83 - 12/86	Research Compliance Surveys """
Cobalt-60 10 Ci	AEHA	12/86 - 12/88	Calibration
Blood Irradiator Cs-137 - 2,000 C	i WRAMC	7/91 - Present	Blood Treatment
		and an and an and an and an and an and an	to the substitution of the
8. CERTIFICATION: I certify that the information provid	ed hereon is true and complete to the best of my	knowledge.	nggal kaling tang bilang
<u> 15 F55 97</u> (Date Signed)		Mul C. 2.Co gnature of Applicant)	

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MATERIALS LICENSE

Amendment No. 66

Purs Code nucle to pe spec Regu	suant to the Atomic Energy e of Federal Regulations, C le by the licensee, a license lear material designated bel- ersons authorized to receive rified in Section 183 of the a ulatory Commission now c	rgy Act of 1954, a Chapter I, Parts 30, is hereby issued au ow; to use such mate it in accordance with Atomic Energy Act of or hereafter in effect	s amended, the En 31, 32, 33, 34, 35, 3 thorizing the license erial for the purpose(the regulations of t of 1954, as amended, and to any condition	ergy Reorganization A 19, 40 and 70, and in rel e to receive, acquire, po s) and at the place(s) des he applicable Part(s). Th , and is subject to all app ins specified below.	Act of 1974 (Public iance on statements sessess, and transfer l signated below; to do is license shall be de licable rules, regulat	c Law 93-438), and Title 10 and representations heretofor opproduct, source, and specia eliver or transfer such materia med to contain the condition tions and orders of the Nuclea
		Licensee		In accordan	nce with the	application dated
· 1. [Department of the Walter Reed Army	e Army Medical Cent	er (WRAMC)	3. License number	08-01738-02	2 is amended in
2.	-		THE REAL	its entire	ty to read as	s follows:
	Washington, D.C.	20307-5001	refin	C.Expiration date	June 30, 1	1999
		, d		5. Docket or Reference No.	030-01317	
6. E s	Byproduct, source, and/o special nuclear material		7. Chemical an form	nd/or physical	6. Maxim may po onder t	um amount that licensee ossess at any one time this license
Α.	Any byproduct ma atomic numbers 1	aterial with 1-83	A. Any		A. 400 r radio possi durà	nillicuries of eac onuclide with a to ession limit of 26
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U.S. Nº EAR REGULATORY COMMISSION NRC Form 374A Z b PAGES (5-84) License numb 08-01738-02 MATERIALS LICENSE Docket or Reference number SUPPLEMENTARY SHEET 030-01317 Amendment No. 66 (Items 6., 7. & 8. continued) 7. Chemical and/or physical 8. Maximum amount that 6. Byproduct, source, and/or special nuclear material form licensee may possess at any one time under this license S. Cesium 137 S. Sealed sources T. Sealed sources T. Cobalt 60 U. 100 microcurie U. Áný 🦄 U. Americium 241 V. Americium 241 V. Sealed sources 🔔 l curie W. Sealed sources and foils W. Nickel 63 X. Iodine 129 X. Sealed sources X. 1 curie Y. Any Y. Thorium Y.-5 kilograms Z. Uranium Z. Any Z. 50 kilograms AA. Sealed sources AA. Cesium 137 AA . BB. Americium 241 BB. Sealed sources BB. CC. Sealed source CC. Cesium 137 CC. DD. Uranium depleted in DD. Plated Metal 400 Kilograms Uranium 235 9. Authorized use A. through CC. Medical diagnosis, therapy and research in humans in accordance with any applicable Food and Drug Administration (FDA) requirements. Research and development as defined in 10 CFR 30.4, including animal studies; instrument calibration; student instruction. DD. **Shielding** CONDITIONS 10. Location of use: Walter Reed Army Medical Center, Washington, D. C.; WRAMC Forest Glen Section and Annex, Silver Spring, Maryland; Walter Reed Army Institute of Research Animal Holding Facility, Fort Meade, Maryland; U.S. Army Medical Laboratory, WRAMC Department of Pathology, Fort Meade, Maryland; and U.S. Army Institute of Dental Research Facility, Fort Meade, Maryland; Rickman Building, 13 Taft Court, Rockville, Maryland and Gillette Building, 270 Research Center, 1413 Research Boulevard, Rockville, Maryland. 11. Licensed material shall be used by, or under the supervision of, individuals Α. designated in writing by the Radiation Safety Committee, Col. Joan T. Zajtchuk Chairperson. UMUMUMUMUMU

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		MATERIALS LICENSE	Docket or Reference	e number	1/30-	02		
		SUPPLEMENTARY SHEET		030-0	01317			
				Ameno	lment	No.	66	
· .	B. The use of licensed material in or on humans shall be by a physician, dentist, or podiatrist as defined in 10 CFR 35.2.							
	C. Physicians, dentists, or podiatrists designated to use licensed material in or on humans shall meet the training criteria established in 10 CFR 35, Subpart J and shall be designated in writing by the licensee's Radiation Safety Committee.							
	D. The Radiation Safety Officer for this license is LTC William B. Johnson.							
10	Tasis da	EAR REC	U_{i}	a aha11	£	* • • •		
12.	in add the po limits emerge	In addition to the possession limits in Item 8, the Licensee shall further restrict the possession of licensed material at a single location to quantities below the limits specified in 10 CFR 30.72 which require consideration of the need for an emergency plan for responding to a release of licensed material.						
13.	Notwithstanding the requirements of 10 CFR 35.49(a) and (b), 35.100, 35.200, 35.300, 35.400 and 35.500 the licensee may use for any medical use any byproduct material or reagent kit. The licensee shall possess and use byproduct material for medical use in accordance with the prescriptive and performance criteria in the other sections of 10 CFR 35. This does not relieve the licensee from complying with applicable U.S. Food and Drug Administration (FDA) and other Federal and State requirements.							
14.	A. Detector cells containing a titanium tritide foil or a scandium tritide foil shall only be used in conjunction with a properly operating temperature control mechanism which prevents the foil temperatures from exceeding that specified in the certificate of registration referred to in 10 CFR 32.210.							
	B. V	B. When in use, detector cells containing a titanium tritide foil or a scandium tritide foil shall be vented to the outside.					um	
15.	The licensee shall conduct a physical inventory every three months to account for all sealed sources and devices containing licensed material received and possessed pursuant to 10 CFR 35.59, 35.400 and 35.500 and every six months for all other sealed sources and devices.						or all sealed	
16.	A. 9	Sealed sources and detector cells containi for leakage and/or contamination at interv such other intervals as are specified by t referred to in 10 CFR 32.210, not to excee	ng licensed als not to e he certifica d three year	materia xceed s te of r s.	al sh six m regis	all t onths trati	be te s or ion	sted at
	B. I	Notwithstanding Paragraph A of this Condit alpha particles shall be tested for leakag not to exceed three months.	ion, sealed e and/or con	sources taminat	s des tion	ignec at ir	l to nterv	emit als
	C.	In the absence of a certificate from a tra has been made within six months prior to t detector cell received from another person tested.	nsferor indi he transfer, shall not b	cating a seal e put i	that led s into	a le ource use u	eak t e or until	est
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(iii) the half-life of the isotope is 30 days or less; or								
(iv) they contain not more than 100 microcuries of beta and/or gamma emitting material or not more than 10 microcuries of alpha emitting material; or								
(v) they are not designed to emit alpha particles, are in storage, and are not being used. However, when they are removed from storage for use or transfer to another person, and have not been tested within the required leak test interval, they shall be tested before use or transfer. No sealed source or detector cell shall be stored for a period of more than 10 years without being tested for leakage and/or contamination.								
05 microcurie of als the presence of ort shall be filed or detector cell ed, repaired, or report shall be known with the , Nuclear Materials Vania 19406. The the test results, and								
r analysis by the nation may be on or an Agreement								
hall not be opened or								
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	MATERIALS LICENSE	08-01738-02											
	SUPPLEMENTARY SHEET	O30-01317											
		Amendment No. 66											
18.	The licensee is authorized to hold radioactive material with a physical half-life of less than 65 days and Sulfur 35, Cobalt 58, Iridium 192, Scandium 46, for decay-in- storage before disposal in ordinary trash, provided:												
	A. Waste to be disposed of in this manner shall be held for decay a minimum of ten half-lives.												
	B. Before disposal as ordinary trash, the waste shall be surveyed at the container surface with the appropriate survey instrument set on its most sensitive scale and with no interposed shielding to determine that its radioactivity cannot be distinguished from background. All radiation labels shall be removed or obliterated.												
	C. A record of each such disposal permitted retained for three years. The record mu date on which the byproduct material was disposed, the survey instrument used, th measured at the surface of each waste co who performed the disposal.	d under this License Condition shall be ust include the date of disposal, the s placed in storage, the radionuclides he background dose rate, the dose rate ontainer, and the name of the individual											
19.	Experimental animals, or the products from experimental animals, that have been administered licensed materials shall not be used for human consumption.												
20.	The licensee shall possess and use byproduct material for human research in accordance with the prescriptive and performance criteria in all sections of 10 CFR Part 35 except sections 35.49(a) and (b), 35.100, 35.200, and 35.300.												
21.	The licensee is authorized to transport licer provisions of 10 CFR Part 71, "Packaging and	nsed material in accordance with the Transportation of Radioactive Material."											
22.	The licensee shall not acquire licensed mater the source or device has been registered with pursuant to 10 CFR 32.210 or equivalent regu	rial in a sealed source or device unless the U.S. Nuclear Regulatory Commission lations of an Agreement State.											
23.	Radioactive waste generated shall be stored representations, and procedures included with licensee's letter/application dated September	in accordance with the statements, n the waste storage plan described in the r 9, 1993 and October 29, 1993.											
7.1.2													
FRC F 5-84)	orm 374A		U.S	LEAR	REGULA	FORY COM		icente put	PAGE	6	OF	6	PAGE
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4.	Except its pro contain changes The U.S statemo	as spe ogram i ned in s in th S. Nucl ents, r	cifical n accord the docu e medica ear Regu represent ce are mu	ly provi dance wi uments, al use r ulatory tations, ore rest	ded ot th the includ adiati Commis and p	herwise statem ing any on safe sion's rocedur e than	in thi ents, r enclos ty proc regulat es in t the reg	s licens epresent ures, li edures a ions sha he licen ulations	e, the li ations, a sted belo s provide ll govern see's app	cense nd pr w, ex d in unle licat	e sh oced cept 10 C ss t ion	all c ures for FR 35 he and	conduc minor 5.31.
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License No. 08-01738-02 Docket No. 030-01317 Control No. 117725

Department of the Army ATTN: DASG-PSP-E(COL Peter Myers) 5109 Leesburg Pike Washington, DC 20307-5001

Dear Colonel Myers:

Please review the enclosed document carefully and be sure that you understand all conditions. If there are any errors or questions, please notify the U.S. Nuclear Regulatory Commission, Region I office, the Licensing Assistance Section, (610) 337-5093 or 5239, so that we can provide appropriate corrections and answers.

Please be advised that your license expires at the end of the day, in the month, and year stated in the license. Until your license is terminated, you must conduct your program involving byproduct materials in accordance with the conditions of your NRC license, representations made in your license application, and NRC regulations. In particular, note that you must:

- Operate in accordance with NRC regulations 10 CFR Part 19, "Notices, Instructions and Reports to Workers; Inspections," 10 CFR Part 20, "Standards for Protection Against Radiation," 10 CFR Part 35, "Medical Use of Byproduct Material," and other applicable regulations.
- 2. Notify NRC, in writing, within 30 days:
 - a. when an authorized user, Radiation Safety Officer, Teletherapy Physicist, or Medical Physicist permanently discontinues performance of duties under the license or has a name change; or
 - b. when the licensee's mailing address changes (no fee is required if the location of byproduct material remains the same).
- 3. In accordance with 10 CFR 30.36(b) and/or license condition, notify NRC, promptly, in writing, and request termination of the license when you decide to terminate all activities involving materials authorized under the license.
- 4. In accordance with 10 CFR 35.13, request and obtain a license amendment before you:
 - a. receive or use byproduct material for a clinical procedure permitted under Part 35 but not permitted by your license issued pursuant to this Part;
 - b. permit anyone, except a visiting authorized user described in 10 CFR 35.27, to work as an authorized user under the license;

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Department of the Army

- change Radiation Safety Officers, Teletherapy Physicists or Medical с. Physicists:
- d. order byproduct material in excess of the amount, or radionuclide, or form different than authorized on the license:
- add or change the areas of use, or address or addresses of use e. identified in the license application or on the license.
- 5. Receive written approval from the NRC prior to any change ownership of your organization in accordance with 10 CFR 30.34(b).
- 6. Submit a complete renewal application with proper fee or termination request at least 30 days before the expiration date of your license. You will receive a reminder notice approximately 90 days before the expiration date. Possession of byproduct material after your license expires is a violation of NRC regulations. A license will not normally be renewed, except on a case-by-case basis, in instances where licensed material has never been possessed or used.

In addition, please note that NRC Form 313 requires the applicant, by his/her signature, to verify that the applicant understands that all statements contained in the application are true and correct to the best of the applicant's knowledge. The signatory for the application should be the licensee or certifying official rather than a consultant.

You will be periodically inspected by the NRC. Failure to conduct your program in accordance with NRC regulations, license conditions, and representations made in your license application and supplemental correspondence with NRC will result in enforcement action against you. This could include issuance of a notice of violation, or imposition of a civil penalty, or an order suspending, modifying or revoking your license as specified in the General Policy and Procedures for NRC Enforcement Actions, 10 CFR Part 2, Appendix C.

Since serious consequences to employees and the public can result from failure to comply with NRC requirements, prompt and vigorous enforcement actions will be taken when dealing with licensees who do not achieve the necessary meticulous attention to detail and the high standard of compliance which NRC expects of its licensees.

Thank you for your cooperation.

Sincerely,

Original Signed By: Thomas K. Thompson

Thomas K. Thompson Nuclear Materials Safety Branch Division of Radiation Safety and Safeguards

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Department of the Army

Enclosures: 1. Amendment No. 66

cc:

Walter Reed Army Medical Center (WRAMC) ATTN: Major General Ronald R. Blanck Commanding Officer Washington, DC 20307-5001

DRSS:RI Tkthompson

6/14/94

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DEPARTMENT OF THE ARMY

WALTER REED ARMY MEDICAL CENTER WASHINGTON, DC 20307-5001



REPLY TO ATTENTION OF:

June 2, 1994

Health Physics Office

SUBJECT: Additional Information for Review of Renewal of U.S. Nuclear Regulatory Commission License No. 08-01738-02, mail control No. 117725

Nuclear Materials Safety Branch Division of Radiation Safety and Safeguards ATTENTION: Mr. Thomas K. Thompson U.S. Nuclear Regulatory Commission, Region I 475 Allendale Road King of Prussia, Pennsylvania 19406-1415

Removed

Dear Mr. Thompson:

In response to our phone conversation of May 25, 1994, pertaining to the renewal of License No. 08-01738-02, Control No. 117725, the following additional information is provided:

1. A memorandum dated 13 May 1994, was forwarded through Army channels requesting that NRC License No. 08-01738-02 and NRC License No. 08-01738-03 be amended to approve myself as the Radiation Safety Officer on both licenses. Headquarters, Department of the Army, Office of the Surgeon General, Falls Church, VA, forwarded the request to the NRC, Region I, per memorandum dated June 1, 1994. The memorandums with enclosures are provided as you requested as enclosure 1.

2. We have reviewed the provisions of 10 CFR 30.32(i). The limits for all conditions of 10 CFR 30.72, Schedule C have been reviewed, and under the current and requested license limits we do not exceed any specific activity limits. In addition, the sum of our license limits for any isotope divided by the Schedule C appropriate activity limit does not exceed 1. This would indicate that our license is exempt from the provisions of 10 CFR 30.32(i). This calculation will remain on file at the Health Physics Office.

3. The Nuclear Medicine Service has revised the Quality Management Program (QMP), and the revised QMP from the Nuclear Medicine Service dated March 22, 1994, is provided as enclosure 2. The Radiation Oncology Service QMP dealing with brachytherapy was extracted from the Radiation Oncology Service Policy and Procedure Manual and is provided as enclosure 3.

4. During our phone conversation on May 25, 1994, you indicated a new NRC policy precluded issuing a blanket statement

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117725 JUN - 6 1994 for the decay-in-storage of any radioisotope with a half-life of less than 90 days, as is currently listed as Condition 18 of our license. As requested we submit the following information to support the decay-in-storage of radioactive material:

a. In addition to authorization to hold radioactive material with a half-life of less than 65 days for decay-instorage before disposal in ordinary trash, we request approval for decay-in-storage for the following radioactive materials: cobalt-58, iridium-192, sulfur-35, and scandium-46. These radioactive materials all have half-life of greater than 65 days, but less than 90 days, and are currently authorized on our license for decay-in-storage.

b. Justification for decay-in-storage. This request will support reducing the volume of low level radioactive waste, which at some point in the future must be disposed of as low level radioactive waste. Sulfur-35, cobalt-58, iridium-192, and scandium-46, account for a significant volume of the low level radioactive waste generated at this facility. Allowing decay-instorage, and then disposing of this waste after proper monitoring in ordinary trash would significantly reduce our volume of low level radioactive waste. With the unavailability of any low level radioactive waste site, all waste classified as radioactive waste must be stored on-site. Allowing us to decay the waste to background levels frees up space to accommodate radioactive waste that must be stored until the Pennsylvania low level radioactive waste site is operational. It will also significantly reduce the future costs incurred to dispose of low level radioactive material at Walter Reed Army Medical Center. As you know, the date that the Pennsylvania site will open is uncertain. Decayin-storage of this waste will insure that we have sufficient space to hold radioactive waste prior to the opening of the Pennsylvania low level burial grounds. This request supports the mandates of Congress, the States, and U.S. Army policy to minimize the volume of low level radioactive waste generated, while adhering to strict safety standards that protect the general population and the environment.

I hope you will find the above information sufficient to complete your processing of our application. Any additional questions or comments pertaining the renewal of our license should be directed to the undersigned at (301) 427-5161.

2

William B. Johnson

Enclosures as WILLIAM B. JOHNSON Lieutenant Colonel, U.S. Army Chief, Health Physics Office



DEPARTMENT OF THE ARMY OFFICE OF THE SURGEON GENERAL 5109 LEESBURG PIKE FALLS CHURCH, VA 22041-3258



June 01, 1994

Preventive Medicine Consultants Division

TTENTION OF

US Nuclear Regulatory Commission Region I 475 Allendale King of Prussia, Pennsylvania 19406

Dear Sir:

Enclosed are two copies of a request to amend Byproduct Material License Number 08-01738-02, Walter Reed Army Medical Center, Washington, DC, by appointing Lieutenant Colonel William B. Johnson as Radiation Safety Officer.

Recommend approval.

Sincerely,

Peter H. Myers Colonel, W.S. Army Radiological Hygiene Consultant

Enclosure

CF: HQ, USAEHA, ATTN: HSHB-MR-H, APG, MD 21010-5422 HQ, USWRAMC, ATTN: HSHL-HP, Wash, DC 20307-5001 (wo/encls)



DEPARTMENT OF THE ARMY WALTER REED ARMY MEDICAL CENTER WASHINGTON, DC 20307-5001



HSHL-HP (385-11)

13 May 1994

MEMORANDUM THRU

Commander, U.S. Army Health Services Command, ATTN: HSCL-P, Fort Sam Houston, Texis 78234-6000

HQDA (SGPS-PSP-E), 5109 Leesburg Pike, Falls Church, VA 22041-3258

FOR U.S. Nuclear Regulatory Commission, Region I, Nuclear Safety Section A, 475 Allendale Road, King of Prussia, PA 19406

SUBJECT: Amendment of US Nuclear Regulatory Commission Licenses No. 030-01317 and No. 030-06895

1. Request that NRC Licenses 030-01739-02 08-01739-03to reflect a change in the Radiation Safety Officer from CPT Mark A. Melanson to LTC William B. Johnson. LTC Johnson has been assigned as the Chief, Health Physics Office at Walter Reed Army Medical Center since 9 May 1994.

2. A Training and Experience Form and a Curriculum Vitae for LTC Johnson are attached (Enclosures 1 and 2).

3. POC for this manter is Mr. David W. Burton or LTC Johnson @ (301)-427-5104/5107.

FOR THE COMMANDER:

Enl J. Neuromen

EARL'S. NEWSOME III LTC, MS Executive Officer

2 Encls

NRC FORM 313N	A SUPPLEMEN.	A US NUC TRAINING AND EXPERIEN	CLEA REGULATO	RY COMMISSION
	AUTHORIZE	D USER OR RADIATION SA	FETY OFFICER	
1. NAME OF AU RADIATION S	THORIZED USER AFETY OFFICER	. OR	2. STATE OR TER WHICH LICENS PRACTICE MEI	RITORY IN SED TO DICINE:
WILLIAM B.	JOHNSON, Ph.D.		NOT APPLICA	BLE
<u></u>	and the second	3. CERTIFICATION		
SPECIALT	Y BOARD	CATEGORY B	MONTH & YE.	AR CERTIFIED
NOT APP	LICABLE	NOT APPLICABLE	NOT APP	LICABLE
4. TR.	AINING RECEIVE	D IN BASIC RADIOACTIVE	HANDLING TECHN	IIQUES
			TYPE & LENGT	H OF TRAINING
FIELD OF	TRAINING	LOCATION AND DATE(S) OF TRAINING B	LECTURE/ LABORATORY COURSES (Hours) C	SUPERVISED LABORATORY EXPERIENCE (Hours) D
a. RADIATION F INSTRUMENT	PHYSICS AND ATION	 Univ of North Carolina, Chapel Hill, NC, 1980-1983 (3 years) Tulane, New Orleans, LA, 1976 (1 year) Ft. Belvoir, VA, 1970- 1971 (1 year) 	80 60 168	92
b. RADIATION F	PROTECTION	 Reference 1 above Reference 3 above 	140 80	60 120
c. MATHEMATIC USE AND ME OF RADIOAC	CS IN THE ASUREMENT TIVITY	1) Reference 1 above 2) Reference 3 above	125 60	
d. RADIATION H	BIOLOGY	 Reference 1 above Reference 3 above 	40 40	
e. RADIOPHARM CHEMISTRY	1ACEUTICAL	 Reference 1 above Reference 3 above 	200	60 20
5. EXPERI	ENCE WITH RAD	IATION. (Actual use of Radio	isotopes or Equivalen	t Experience)
ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE GAINED	DURATION OF EXPERIENCE	TYPE OF USE
SM-1 Nuclear Power Reactor	1000 KW	SM-1, Ft. Belvoir, VA	1971 (1 year)	Health Physics Surveys; Reactor operations; Calibration

NRC FORM 313M Supplement A - PAGE 1

5. EXPERIEN	CE WITH RADIATIO	N.(Actual use of Radioisotopes or	Equivalent Experier	nce)
ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE GAINED	DURATION OF EXPERIENCE	TYPE OF USE
 ²³⁵U ²³⁸U ²³⁹Pu Pu-Be ²⁴¹Am ¹³⁷Cs ³H 	 216 gm unsealed & soln. sources 3 gm unsealed source 43 gm, liquid sources 3 Ci, Sealed 600 mCi, Sealed 120 Ci, Sealed 110 Ci, Sealed 	U.S. Army Environmental Hygiene Agency Aberdeen Proving Ground, MD NRC Byproduct Material License	1973-1974 (1 year)	Health Physics Surveys; Alternate RSO; Calibration
Atomic No. 3-83 ³ H ¹³¹ I ¹²⁵ I ¹³ C	5 mCi each 10 mCi, liquid 10 mCi, liquid 1 Ci, liquid 1 Ci, liquid	US Army Medical Lab Ft. Sam Houston, TX Radiation Safety Officer NRC Byproduct Material License (Medical)	1974-1975 (1 year)	RSO, RIA kits, Iodinations, Health Physics Surveys; Wet Chemistry procedures
⁹⁹ Mo/ ^{99m} Tc Generator	2 Ci	North Carolina Memorial Hospital Chapel Hill, NC	1982 (1 month)	Clinical Training
Atomic No. 3-83 10 CFR 35 Gp I-II Gp III Gp IV-V ¹³³ Xe ¹³⁷ Cs ¹⁵³ Gd	25 mCi each As needed 3 Ci each As needed 40 mCi 131 Ci 2 Ci	Dwight D. Eisenhower Army Medical Center, Fort Gordon, GA Radiation Safety Officer for Hybrid Broad Scope NRC Materials License (Medical) USNRC No. 10-12044-03	May 1983-June 1989 (6 years)	RSO, Radiation Safety Surveys, Medical Physics Surveys, Calibration
Atomic No. 3-83 ¹⁴ C, ³ H, ⁹⁹ Mo, ^{99m} Tc ³² P, ¹²⁵ I ¹³⁷ Cs	 15 Ci total, ≤ 200 mCi each 5 Ci each, any form 1 Ci each, any form 4200 Ci, sealed source 	Uniformed Services University of the Health Sciences, Bethesda, MD Radiation Safety Officer for Broad Scope Type A NRC Material License (Medical) USNRC No. 19-23344-01	May 1989-June 1992 (3 years)	RSO, Health Physics Surveys, Calibration

Training and Experience continued WILLIAM B. JOHNSON

5. EXPERIEN	CE WITH RADIATIO	N.(Actual use of Radioisotopes or	Equivalent Experier	nce)
ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE GAINED	DURATION OF EXPERIENCE	TYPE OF USE
²³⁵ U ²³⁸ U ²³⁹ Pu ²³⁹ Pu Pu-Be ²⁴¹ Am ¹³⁷ Cs ³ H	 216 gm unsealed & soln. sources 3 gm unsealed source 43 gm, liquid sources 3 Ci, Sealed 600 mCi, Sealed 120 Ci, Sealed 110 Ci, Sealed 	U.S. Army Environmental Hygiene Agency Aberdeen Proving Ground, MD NRC Byproduct Material License	June 1992 - May 1994 (2 years)	Health Physics Surveys; Principle User, Member of the Radiation Control Committee

NRC FORM 313M TRAINING AND EXPERIENCE CONTINUED - PAGE 3

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CURRICULUM VITAE

LTC WILLIAM B. JOHNSON, Ph.D, Medical Service Corps, US Army

Address: Residence:

Work:

Walter Reed Army Medical Center Chief, Health Physics Office Washington D.C. 20307-5001 Phone: (301) 427-5104

ACADEMIC AREAS OF INTEREST:

Health Physics, Medical Physics, Optimizing Medical Images, Quality Control in Radiology, Computers, Public Health

EDUCATION AND TRAINING:

CIVILIAN TRAINING:

University of North Carolina, Chapel Hill, NC, Ph.D., Radiological Hygiene,

Tulane School of Public Health and Tropical Medicine, New Orleans, LA, MPH, Environmental Health, 1976.

Iowa State University, Ames, IA, BS, Mathematics,

Medical X-Ray Protection Course, USPHS, Rockville, MD, 2 weeks, 1973.

Ionizing and Nonionizing Radiation in Medicine, University of Pennsylvania, Philadelphia, PA, 1 week, 1979.

Electronic Imaging in Medicine, University of Texas at San Antonio, TX, 1 week, 1983.

Health Physics Aspects of Nuclear Attack, Health Physics Summer School, Louisiana University, Hammond, LA, 1 week, 1984.

Health Physics In Radiation Accidents, Oak Ridge Associated Universities, Oak Ridge, TN, 1 week, 1985.

MRI Acceptance Testing and Quality Control, The Bowman Gray School of Medicine, Winston-Salem, NC, 1 week, 1988.

International Society for Optical Engineering Medical Imaging V Meeting, San Jose, CA, 1 week, 1991.

Ex6

American College of Radiology's Mammographic Image Quality Course: Role of the Medical Physicist, January 1993, 18 CME credits awarded.

MILITARY TRAINING:

Nuclear Power Plant Operator Course (Health Physics Specialty), Ft. Belvoir, VA, 1 year, 1971.

AMEDD (MSC) Officer Basic Course, Ft. Sam Houston, TX, 9 weeks, 1972

AMEDD Officer Advanced Course, Ft. Sam Houston, TX, 24 weeks, 1975.

Command and General Staff Officer Course (Correspondence Option), 1 year, 1987.

Faculty Development Course, Academy of Health Sciences, Ft. Sam Houston, TX, 4 weeks, 1976.

Medical Effects of Nuclear Weapons, Armed Forces Radiobiology Research Institute, Bethesda, MD, 1 week, 1983.

Medical Physics and Military Medicine, US Army Environmental Hygiene Agency, Aberdeen Proving Ground, MD, 1 week, 1983, 1985, 1987, 1988, 1989, 1991, 1993.

TEACHING EXPERIENCE:

1990-1993, Assistant Professor of Preventive Medicine and Biometrics, Uniformed Services University of the Health Sciences, Bethesda, MD.

1977-1979, Instructor, Radiological Physics, Academy of Health Sciences, Ft. Sam Houston, TX.

1977-1979, Assistant Professor of Health Sciences, Baylor University at San Antonio, San Antonio, TX.

1969-1970, High School Teacher (Mathematics), Grant Community High School, Fox Lake, IL.

PROFESSIONAL EXPERIENCE:

1. June 1992 to May 1994, Chief, Health Physics Division, U.S. Army Environmental Hygiene Agency, Aberdeen Proving Ground, MD.

Duties: Leads and manages the Health Physics Division composed of the Medical Health Physics Branch, the Industrial Health Physics Branch and an Administrative Section. Directs the activities of

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some 25 professional health physicists in world wide mission of support of U.S. Army Radiation Protection Programs. Support includes complete radiation protection program evaluations for compliance with Federal, Army, and Nuclear Regulatory Commission (NRC) Licenses for Medical and Industrial facilities, medical and industrial x-ray surveys, radiation dose assessments from bioassay data, assistance in preparation of documents to terminate NRC licenses, and conducting verification surveys for NRC License termination. Radiation protection policies are developed for the Army Surgeon General for implementation Army wide. Act as principle user of radioactive materials, supervisor of ¹³⁷Cs irradiator for calibration, and member of the Radiation Control Committee.

2. June 1989 to June 1992, Deputy Director, Environmental Health and Occupational Safety; Chief, Radiation Safety and Radiation Protection Officer, Uniformed Service University of the Health Sciences (USUHS), Bethesda, MD.

Responsible for the supervision and management of Duties: broad scope US Nuclear Regulatory Byproduct Materials License No. 19-23344-01. Supervises health physics personnel in the performance of laboratory radiation protection surveys, personnel dosimetry program, laboratory analysis, and radioactive material control. Provides technical advice to some 350 radiation workers working in about 150 radioisotope laboratories. Teaches in various graduate level courses in Preventive Medicine and Radiology. Provides technical consultation to Director and other Branch Chiefs. Acts as the Director when the Director is absent. Has been designated the Medical Physics Consultant on acquisition and acceptance testing of Computerized Tomography (CT) Systems and Magnetic Resonance Imaging (MRI) Systems for the Army Surgeon General. This CT and MRI mission is world wide.

3. June 1983-June 1989, Chief, Health Physics, Dwight D. Eisenhower Army Medical Center, Ft. Gordon, GA.

Served as Chief, Health Physics, and Radiation Duties: Protection Officer. Responsible for supervision and management of broad scope radiation protection program including management of US Nuclear Regulatory Byproduct Materials License No. 10-12044-03 and Department of Army Radioactive Materials Authorization No. 10-07-Served as Regional Consultant to DOD Health Region 10, which 81. includes 9 Army Community Hospitals, and clinics in Panama and Puerto Rico. Performs Technical Surveys of radioactive materials and radiation producing devices to evaluate health hazards and performs medical physics evaluations to optimize imaging. Provides education support to professional staff. Supervises the personnel dosimetry program and performs dosimetry analysis of both radiation workers and patients. Is the Medical Physics Consultant on acquisition and acceptance testing of Computerized Tomography (CT)

3-

Systems and Magnetic Resonance Imaging (MRI) Systems for the Army Surgeon General. This CT and MRI mission is world wide.

4. September 1976 - June 1980, Chief, X-Ray Branch, Academy of Health Sciences, Ft. Sam Houston, TX.

Duties: Programs, plans and supervises overall operation of branch, including performance of 36 instructors and about 430 students annually. Branch is responsible for teaching the x-ray technologist program (radiographic) for the US Army. Also coordinates, plans, and supervises clinical training. Serves as Chairman of X-Ray Specialist Curriculum Committee, and Chairman of Medicine and Surgery Division Physics and Biophysics Committee. Serves as subject matter expert in radiology for Combat Development and Health Care Systems.

5. January 1975 - July 1975, Chief, Health Physics Branch, US Army Environmental Hygiene Agency Regional Activity South, Ft. Sam Houston, TX.

Duties: Conducts radiation protection surveys of US Army installations containing or generating ionizing radiation. Geographical area of support is all states west of the Mississippi River. Also reviews NRC license and DA Authorization applications. Performs technical consultation on radiation safety hazards.

6. March 1974 - December 1974, Chief, Department of Nuclear Medical Sciences, US Army Medical Laboratory, Ft. Sam Houston, TX.

Duties: Supervises laboratory procedures and techniques of radiation biology, radiochemistry, and biophysics for regional reference laboratory. Geographic area of support includes United States, Pacific Region, Korea, and Panama. Supervises radiation detection measurements, preparation and analysis of radioisotopes in support of diagnostic and other clinical procedures. Provides support on environmental surveillance. Advises on radiological hygiene matters to prevent unnecessary exposure of personnel to ionizing radiation. Performs duty of Chairman, Radioisotope Committee, and Radiological Protection Officer. Manages all aspects of AEC License No. 42-06316-01, and Department of Army Authorization for Radioactive Materials. Performs Health Physics surveys and overall monitoring of all Laboratory Departments engaged in work involving radioactive material.

7. January 1973 - February 1974, Survey Officer, Health Physics Division, US Army Environmental Hygiene Agency, Aberdeen Proving Ground, MD.

Duties: Reviews AEC license and Department of Army Authorizations applications as well as drafts Army directives and technical publications pertaining to radiological health; evaluates proposed

-4

in-system items containing or generating ionizing radiation; makes on-site surveys of Army diagnostic, industrial, and therapeutic xray facilities, radioactive sources, accelerators, human use of radioisotopes and other sources of ionizing radiation; prepares reports with recommendations for corrective action; assists in training activities. Performs as Alternate Radiological Protection Officer. This requires preparation and maintenance of records and reports on receipt, issue, use, inventory, storage, and disposal of radioactive materials. Performs health physics surveys of all agency divisions engaged in working with radioactive materials.

8. September 1972 - October 1972, Health Physics Technician, SM1 Nuclear Power Plant, Ft. Belvoir, VA.

Duties: Conducts radiological surveys, performs treatment to maintain proper process fluid conditions of nuclear power plant. Operates nuclear power plant controls and equipment. Assists in refueling operations and preparing spent fuel elements and demineralizers for storage and shipment. Monitors process fluids for radioactivity and performs chemical separations. Conducts radiological surveys of nuclear power plant personnel, equipment, work areas and reactor elements.

MEMBERSHIPS, PAPERS, PRESENTATIONS AND AWARDS:

Member, Health Physics Society (1973) Member, Eta Chapter, Delta Omega Society (1977)

"The Final Step in Decommissioning of the SM-1A Nuclear Power Plant: A Closeout Survey," AEHA Report No. 43-001-74, Health Physics National Meeting, 1974.

"A Data Base Management System For Real-Time Monitoring of Operating Parameters of A Diagnostic X-Ray System," Ph.D. Dissertation, University of North Carolina, Chapel Hill, NC, 1983.

"Computerized Quality Assurance in Diagnostic Radiology," Health Physics National Meeting, Baltimore, MD, 1983.

"Acceptance Testing of Computerized Tomography Systems," Savannah River Chapter Health Physics Society Meeting, September 1985.

"Operational Problems for a Radiation Protection Program at A Major Medical Institution," Medical Physics in Military Medicine Course, AEHA, MD, September 1987.

"A Protocol to Comply With The Joint Commission of Accreditation of Health Care Organizations Requirements in Diagnostic Radiology," Medical Physics In Military Medicine Course, AEHA, MD, October 1988.

5

TELEPHONE CONVERSATON RECORD	Date: May 24, 1994	Time: 10:43
Mail Control No.: // 77 25	License No.: 08-01738-02	Docket No.:
Person Called: Lt. Colonel William B. Johnson	Organization: Walter Reed Army Med. Ctr.	Telephone Number: 412 427-5104

Person Calling: Thomas K. Thompson

Subject: Some additional questions.

Summary: Discussed with Colonel Johnson that I became aware that he desires to be named as RSO and that I need clarification on a few issues as follows:

a) Please submitt the your credentials for RSO.

b) Please identify and justify your need for decaying isotopes of > then 65 day half-life. c) Although you have not requested any specific byproduct material that would require an emergency plan the sum of ratios could put you over the values which do not require such a plan. Do you intend to limit the possession of byproduct materials to stay under the requirement for a plan or will you submit a plan?

d) A preliminary check of your QM plan indicates you have not addressed sealed source therapy or radiopharmaceutical therapy other than I-131.

Please provide this information.

Action Required/Taken:

Date: Signature: 5/20/94



DEPARTMENT OF THE ARMY WALTER REED ARMY MEDICAL CENTER WASHINGTON, DC 20307-5001



030-01317

P-7

REPLY TO ATTENTION OF:

February 15, 1994

Health Physics Office

SUBJECT: Additional Information for Review of U.S. Nuclear Regulatory Commission License No. 08-01738-02, Mail Control No. 117725

Nuclear Materials Safety Branch Division of Radiation Safety and Safeguards ATTENTION: Mr. Thomas K. Thompson U.S. Nuclear Regulatory Commission, Region I 475 Allendale Road King of Prussia, Pennsylvania 19406-1415

Dear Mr. Thompson:

In reviewing our licensing correspondence with your office I noticed an error concerning the survey criteria that we forwarded to your office in a memo dated 9 September 1993. In that correspondence we indicated that the health physics staff would conduct weekly surveys for users handling 200 uCi or more and monthly surveys for all other areas. That is incorrect.

We propose the following revision:

(1) Areas using 200 uCi or more will still receive weekly surveys from the Health Physics Office.

(2) Areas using less than 200 uCi but more than 10 percent of the values in 10 CFR Part 20, Appendix C will receive monthly surveys by the health physics staff and daily surveys by the user each day of use.

(3) Areas using less than 10 percent of the values in 10 CFR Part 20, Appendix C will receive quarterly surveys by the health physics staff and we will not require users to conduct daily surveys.

We feel that these criteria will ensure an adequate level of safety while avoiding onerous requirements on the part of our researchers. I hope you will find the above information sufficient to complete your processing of our application. Please feel free to contact me @ (301)-427-5104/5107 if you any questions.

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MARK A. MELANSON, CHP Captain, U.S. Army Chief, Health Physics Office

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DEPARTMENT OF THE ARMY

WALTER REED ARMY MEDICAL CENTER WASHINGTON, DC 20307-5001



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REPLY TO ATTENTION OF:

December 9, 1993

Health Physics Office

SUBJECT: Additional Information for Review of Renewal of U.S. Nuclear Regulatory Commission License No. 08-01738-02, mail control No. 117725

Nuclear Materials Safety Branch Division of Radiation Safety and Safeguards ATTENTION: Mr. Thomas K. Thompson U.S. Nuclear Regulatory Commission, Region I 475 Allendale Road King of Prussia, Pennsylvania 19406-1415

Dear Mr. Thompson:

In response to your letter of November 30, 1993, pertaining to the renewal of License No. 08-0738-02, Control No. 117725, the following additional information is provided:

1. In addition to the audit elements described in our October 29, 1993 letter, independent room surveys are performed as described in paragraph 1, September 29, 1993 letter. Elements of these surveys include checking for posting of required documents, observing work habits of and discussion with technicians and users to ensure the general rules for the safe use of radioactive material are being followed, compliance with NRC and Army regulations and to evaluate training effectiveness. A written survey report listing deficiencies, recommended corrective actions, and/or helpful suggestions is provided the user.

2. Paragraph 3.a.(3) of the model ALARA program will be retained.

I hope you will find the above information sufficient to complete your processing of our application.

ARTHUR/G. SAMILJAN Lieutenant Colonel, U.S. Army Chief, Health Physics Office

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License No. 08-01738-02 Docket No. 030-01317 Control No. 117725

Department of the Army Walter Reed Army Medical Center ATTN: Major General Ronald R. Blanck Commanding Officer Washington, DC 20307-5001

Dear Major General Blanck:

2.

This is in reference to your application dated January 21, 1993 and your letter dated October 29, 1993 to renew License No. 08-01738-02. In order to continue our review, we need the following additional information:

1. The documentation you have provided on your radiation safety audits indicates that activities and work areas are reviewed in order to determine compliance with procedures possession limits, record keeping and posting. Your procedure appears to be weak in that your audits are announced and that most of the emphasis is on record keeping, posting and other administrative matters. In our September 1993 letter Items 3.(b. through d.) have not been addressed entirely in your submittal. You should provide additional information that demonstrates your audits cover more than record and inventory compliance, that audits will be unannounced reviews of radiation workers safety practices.

You have indicated that you want to delete paragraph 3.a.(3) from your proposed ALARA program. We do not recommend that you delete the quarterly audits of radiation surveys that are to be reported to the Radiation Safety Committee by the Radiation Safety Officer. This is a useful feature of the ALARA program and should be included. Please confirm you will retain such audits.

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Department of the Army

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We will continue our review upon receipt of this information. Please reply in <u>duplicate</u> to my attention at the Region I office and refer to Mail Control No. 117725. If you have any technical questions regarding this deficiency letter please call the reviewer at (215) 337-5303.

Sincerely,

Original Signed By: Thomas K. Thompson

Thomas K. Thompson Senior Health Physicist Nuclear Materials Safety Branch Division of Radiation Safety and Safeguards

DR\$S:RI Thompson/gc

M2130193

OFFICIAL RECORD COPY - S:\NMSB\DEF\WALTDEF - 11/30/93



DEPARTMENT OF THE ARMY WALTER REED ARMY MEDICAL CENTER WASHINGTON, DC 20307-5001



REPLY TO ATTENTION OF:

October 29, 1993

Health Physics Office

SUBJECT: Additional Information for Review of Renewal of U.S. Nuclear Regulatory Commission License No. 08-01738-02, mail control No. 117725

Nuclear Materials Safety Branch Division of Radiation Safety and Safeguards ATTENTION: Mr. Thomas K. Thompson U.S. Nuclear Regulatory Commission, Region I 475 Allendale Road King of Prussia, Pennsylvania 19406-1415

Dear Mr. Thompson:

In response to your letter of September 29, 1993, pertaining to the renewal of License No. 08-0738-02, Control No. 117725, the following additional information is provided:

1. The minimum requested information that is required of proposed users is detailed on the enclosed authorization application forms. (Enclosures 1-3)

2. The information indicated in Information Notice 90-09, Attachment 1 is provided at enclosure 4.

3. The minimum elements of our authorization audits are detailed in the Health Physics Office Standing Operating Procedure 1-26. (Enclosure 5) Performance of independent surveys was addressed in paragraph 1 of our September 9, 1993 letter.

4. The minimum information recorded for radiation safety training is date training was given, place, instructor, and names of attendees. The groups of workers who will receive training are listed at ATT 8.1 of original application.

5. Please change Item 10.2 of original application to read "We will establish and implement the model ALARA program in Appendix G to Regulatory Guide 10.8, Revision 2 except that paragraph 3.a.(3) is deleted".

6. Please change Item 10.5 of original application to read "We will establish and implement the model spill procedures in Appendix J to Regulatory Guide 10.8, Revision 2 except that the Alternate RSO will follow up on the cleanup of the spill and will attach an Incident Memorandum to the Contamination Survey.

OFFICIAL RECORD COPY ML 10

117725 NOV 0 8 1993 I hope you will find the above information sufficient to complete your processing of our application.

Enclosures as

B hmi

ARTHUR G. SAMILJAN Lieutenant Colonel, U.S. Army Chief, Health Physics Office

INSTRUCTIONS FOR PREPARATION OF APPLICATION FOR AUTHORIZATION TO USE RADIOACTIVE MATERIAL (NON-HUMAN USE)

Encl

WRAMC FORM 1662R (FEBRUARY 1979)

GENERAL INFORMATION

 An applicant for an "Authorization to Use Radioactive Moterial (Non-Human Use)" should complete WRAMC Form 1662R in detail and submit in duplicate to the WRAMC Health Physics Office.

2. Application for gamma irradiators should include a copy of the proposed Standard Operating Procedures that will be implemented to assure personnel safety during routine operation and emorganizy shouticits.

3. All proposed locations where the applicant desires to use, store, or dispose of radioactive material should be coordinated with the Health Physics Office Reactor and Survey Branch prior to submission of the application in order to assure expeditious processing of the application. Submission of an incomplete application will often result in a delay in issuance of an authorization because of the correspondence necessary to obtain information requested on the application.

EXPLANATION OF WRAMC FORM 1662R (FEBRUARY 1979)

1. WRAMC Form 1662R is designed for use in supplying information on radioactive materials use programs of varying complexity. The applicant should provide complete information on his proposed program for the possession and use of radioactive material for those items that do not apply, indicate as N/A (not applicable).

2. Application for new authorizations and renewal of existing authorizations should be completed in their entirety. However, applications for amendment of existing authorizations may be completed as follows:

- a. Complete Items 1, 2, 3, 11, and 12.
- b. For those items that do not required amendment indicate as N/C (no change).
- c. For those items that require amendment indicate the proposed changes to the current authorization.

3. Explanation of WRAMC Form 1662R Items:

1. Self explanatory.

2. The "Principal User" is the individual who beats ultimate responsibility for possession, inventory and implementation of the sofety procedures necessary to assure the sofe use of the materials specified in the application. He is directly responsible to the WRAMC Radiation Control Committee. Attach a completed WRAMC Form 1643 if a current copy is not on file with the Health Physics Office.

3. The applicant's address should include organization, activity, building, room number, and reference or office symbol.

4. A ""Co-Worker" is on individual who possesses adequate training and experience with radioactive material to qualify him as a "Principal User". He works under the direction of and is responsible to the "Principal User for the safe and proper use of the materials specified in the application. List all Co-Workers alphabetically by last name. Each Co-Worker should be identified as follows: Last name, first name, middle initial and grade. Attach a completed WRAMC Form 1643 for each Co-Worker if a current copy is not on file with the Health Physics Office.

5. A "Trainee" is an individual who works under the direct supervision of a Principal User or Co-Worker for the purpose of obtaining the necessary training and experience to qualify for either status. List all trainees alphabetically by last name. Each Trainee should be identified as follows: Last name, first name, middle initial and grade.

6. A "Technician" is an individual who works under the direct supervision of a Principal User or Co-Worker for the purpose of performing certain routine duties associated with use of materials specified in the application. He does not prossess suitable training and experience to be classified as a Principal User or Co-Worker, and is not undergoing training that would qualify him to attain either status. List all Technicians alphabetically by last name. Each Technician should be identified as follows: Last name, first name, middle initial and grade.

7-9. Self explanatory.

10a. List radiaisatapes by ascending mass number, i.e., the isotope with the smallest mass number is placed at the top of the column and the isotope with the greatest mass number is placed at the bottom of the column.

10b. In addition to the chemical form of the radioisotope indicate whether it is in solid or liquid or gaseous form and whether it is a sealed or unsealed source. In order for radioactive material to qualify as a "sealed source" the radioactive source must be sealed in an impervious container which has sufficient mechanical strength to prevent contact with and dispersion of the radioactive meterial under the conditions of use and wear for which is was designed.

10c. State the maximum millicurie amount of each chemical form of the radioisotope that must be kept in the inventory in order to satisfy mission requirements.

10b. Stote the intended use of each chemical form of the radioisotopes listed in Column Da.

11-12. Self explanatory.

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INFORMATION NEEDED IN AN AMENDMENT REQUEST TO AUTHORIZE EXTENDED INTERIM STORAGE OF LOW-LEVEL RADIOACTIVE WASTE IN 90-09

1. Identification of Waste to be Stored:

a. None

b. H-3, 1.5 Ci; C-14, 0.2 Ci; 2,900 cubic feet in (380) 55gallon drums.

c. (1) C

(2) solid

(3) volume reduction

(4) none

d. H-3, 200 mCi/yr, solid/dry; C-14, 30 mCi/yr, solid/dry; 440 cubic feet in (60) 55-gallon drums.

e. None

2. Plans for Final Disposal:

a. July 1994 for waste generated in Washington, DC and Maryland.

b. Texas for DC waste in 1996 and the Appalachian Compact for MD waste in 2000.

c. As soon as possible after site is available; 1-3 months.

3. Physical Description of Storage Area:

a. See attachment 1.

b. 500 drums, 60 drums/year.

c. Maintained decommissioned reactor facility.

d. Perimeter fence w/secured gate and secured brick and concrete building.

e. Forced air circulation system. This system has provided adequate ventilation for our LLRW storage and processing facility for the past several years. The additional drums of solid, long waste containing H-3 and C-14 will not require modification to this system.

f. The building has an alarm system, fire extinguishers, fire hydrant, and is inspected monthly by fire chief. The additional storage will not require additional safeguard systems or modifications to the existing systems.

Cruch 4

g. The building has a heating and cooling system.

h. The building was designed and built as a reactor with low vulnerability to other hazards.

4. Packaging and Container Integrity:

a. Dry, solid waste compacted in steel, 55-gallon drums. No hazards to integrity of containers; indefinite storage life.

b. Weekly radiation and contamination surveys to include wipe samples and visual inspection.

c. Not applicable

5. Radiation Protection:

a. Area is currently used for LLRW storage and processing with proper posting, surveying, and monitoring. The extended interim storage of H-3 and C-14 will not present a significant radiation hazard nor a significant increase in personnel exposure. The current radiation safety and ALARA programs as described in the license application are adequate for this additional storage of H-3 and C-14.

b. none

c. The Walter Reed Army Medical Center (WRAMC) Emergency Preparedness Plan is activated by dialing (202) 576-3317. This is a central notification number for WRAMC police, fire, and emergency response. The extent of activation will be dependent upon the particular situation. The extended interim storage of H-3 and C-14 will not present significant hazards or risks.

d. The radionuclides requiring extended interim storage are H-3 and C-14. The activity of the radionuclides contained in each waste package received is recorded in a log as a drum is packed. When the drum is filled and sealed the total quantity of each radionuclide is recorded on the drum's identification label. This information is also recorded and maintained on an electronic data file.

6. Training:

a. Health physics technicians attend weekly, one hour professional training classes which cover all aspects of the radiation safety program. Health Physics Office standing operating procedures are reviewed and discussed in detail as part of the training program.

7. Financial Assurance: See attached Statement of Intent.

8. Emergency Preparedness: Not required; however, WRAMC has an Emergency Preparedness Plan.



ATT 1





DEPARTMENT OF THE ARMY WALTER REED ARMY MEDICAL CENTER WASHINGTON, DC 20307-5001



REPLY TO ATTENTION OF:

Office of The Commanding General

STATEMENT OF INTENT

1. I, Ronald R. Blanck, Commander of Walter Reed Army Medical Center, am the Official duly appointed by the Headquarters, Department of the Army, to represent my organization.

2. The Nuclear Regulatory Commission Licenses for which this Statement of Intent is being issued are:

(a) License Number 08-01738-02 (expiration date 30 Apr 93)

(b) License Number 08-01738-03 (expiration date 30 Nov 96)

3. The facilities for which this Statement of Intent is being issued are:

(a) Walter Reed Army Medical Center, Washington, District of Columbia;

(b) Walter Reed Army Medical Center, Forest Glen Section and Annex, Silver Springs, Maryland;

(c) Walter Reed Army Medical Center, Department of Pathology, Fort Meade, Maryland (U.S. Army Medical Laboratory);

(d) Walter Reed Army Institute of Research, Washington, District of Columbia;

(e) Walter Reed Army Institute of Research, Rickman Building, 13 Taft Court, Rockville, Maryland;

(f) Walter Reed Army Institute of Research, Gillette Building, 270 Research Center, 1413 Research Boulevard, Rockville, Maryland;

(g) Walter Reed Army Institute of Research Animal Holding Facility, Fort Meade, Maryland;

(h) U.S. Army Institute of Dental Research Facility, Fort Meade, Maryland;

4. In accordance with the requirements of 10 CFR 30.35, and in my capacity as the Commander of Walter Reed Army Medical Center, I am providing assurance that sufficient funds for decommissioning and disposal of stored radioactive waste will be obtained when necessary for the eventual decommissioning of WRAMC's NRC Licenses and disposal of stored radioactive waste.

Karal Banch

Ronald R. Blanck Major General, U.S. Army Commander

HEALTH PHYSICS WALTER REED ARMY MEDICAL CENTER Washington, DC 20307-5001

HSHL-HP SOP# 1-26 October 28, 1993

AUDIT OF RADIOACTIVE MATERIAL AUTHORIZATIONS

1. GENERAL: In accordance with AR 40-37 and 40-61, semiannual reviews of each WRAMC Radioactive Material Authorization must be performed. Site inspection of all authorized activities and work areas are reviewed in order to determine compliance with procedures, radioisotope possession limits, record keeping, and posting requirements.

2. PURPOSE: The purpose of this SOP is to:

a. Establish the review process used to audit an authorization.

b. Define the items to be audited and establish the criteria for exceptable compliance with Federal and WRAMC regulatory requirements.

c. List the documentation required.

3. REQUIRED FORMS:

a. The following forms must be used or reviewed when setting up, conducting, and/or following up on an audit of a Radioactive Material Authorization:

1. Memorandum: Health Physics Office "Audit of Radioactive Material" (Incl 1).

2. WRAMC Audit of Radioactive Material Form (Incl 2).

3. DA Form 3862: "Controlled Substances Stock Record" (Incl 3) or equivalent.

4. Authorization Program, Isotope Inventory Report Form (generated from the computer).

6. WRAMC Form 538 "Radiation Worker Briefing Card" (Incl 4).

7. Deficient Audit Form (Incl 5)

End 5
October 28, 1993

4. PREPARING FOR AUDIT:

a. Set up appointments with Principle Users (PU) by sending (or hand carrying) Memorandum from Health Physics Office "Audit of Radioactive Material". Audits should be scheduled in groups by location so the auditor can move from one audit to the next with a minimum of lost time. Most audits can be performed in 30 minutes, large authorizations may require more time and should be scheduled accordingly. Some rearranging will be necessary as PU's call to indicate conflicts with their schedules. The auditor should select a mutually agreeable time to reschedule when notified of a conflict.

b. Print a hard copy from the Authorization Program of the authorization you will be auditing, this will include:

- (1) Administrative data
- (2) Personnel and training dates
- (3) Rooms
- (4) Isotopes and limits authorized

c. Print Isotope Inventory Report Form from dBase Inventory data base, to list the isotope shipments received since the last audit and the isotopes still active from the previous audit. This will include the following information for each isotope shipment for the authorization requested:

- (1) HPO tag number
- (2) Chemical form
- (3) Date received

(4) Original activity in millicuries

(5) A blank to list new activity in millicuries

- (6) Last updated activity in millicuries
- (7) Vendor
- (8) Purchase order number
- (9) Call number
- (10) Remarks

2

d. Two copies of the Audit Form with a carbon are prepared so a signed copy can be left with the Principle User at the time of the audit.

e. The folder containing the previous inventory records for this authorization will be pulled from the HPO file.

5. CONDUCTING AN AUDIT: The material assembled in Item 4. b, c, d and e above will be taken by the auditor to the audit. The WRAMC "Audit of Radioactive Material" form will be used as a check list of the major areas of each authorization which need to be inspected. These are:

a. DA Form 3862 (or equivalent) Inventory Records: The authorizations inventory records will be compared to the "Isotope Inventory Report" (see item 4. c.) to ensure they include all shipments delivered to them by the HPO. Each entry in the inventory records shall contain: the isotope, the HPO tag number, date received, activity received, chemical form of compound, the activity used and disposed of, and the activity remaining. The "Isotope Inventory Report" will be completed at this time to show the new "updated activity" for each shipment. This form will be signed and dated at the bottom by the person providing the inventory information and will be used to update the inventory database at the HPO. It will remain on file as a permanent inventory record.

b. Within limits: The authorizations inventory records shall indicate a running balance of activity on hand for each isotope which is authorized. The PU is responsible for ensuring that the isotope limits of each isotope are not exceeded at any time and the auditor will check the running balance against the isotope limits listed on the computer generated copy of the authorization (see item 4. b. (4)).

c. Inventory Control Officer: The individual responsible for the inventory record keeping (PU or Technician).

d. WRAMC Reg 40-10: A copy must be available to radiation workers for information on the safe handling of radioactive material.

e. WRAMC Authorization: A copy of the approved authorization and any amendments most be maintained by the PU. At this time the computer generated copy of the information on the authorization (see item 4. b.) will be shown to the PU and any discrepancies clarified. Any changes which need to be made

3

October 28, 1993

in the authorization can be noted in items 11 or 12 on this form and it will be considered as an amendment request if signed by the PU.

f. General Provisions & Terms and Conditions: A copy must be maintained on file.

g. LSC - Source No. & Location: The location of any liquid scintillation counters with sealed source numbers will be noted.

h. WRAMC 538 "Radiation Worker Briefing Card": This form, required annually for each radiation worker, shall be requested if it has been determined that present records are not current (see item 4. f.).

i. Sink Log: A logbook listing amounts of radioactive material placed into the sanitary sewage system through a wash sink must be available for each wash sink on the authorization. Entries must be made at least monthly when no washes have been performed to indicate that fact. The monthly limit for wash sinks is 100 uCi.

j. Signs and Labels: Each controlled area shall be identified with the appropriate signs such that all employees and visitors who enter shall be informed of the pertinent requirements and procedures for the protection of themselves and fellow workers against internal and external exposure. The following areas and/or documents must be posted:

- (1) Wash Sinks
- (2) LSC
- (3) Entrance/Exit
- (4) NRC Form 3 (map)
- (5) Notice to Employees Letter
- (6) Parts 19&21 of 10CFR

k. Personnel Changes: Additions or deletions. The Audit Form can be used as a memo to make personnel changes if it is signed by the PU (no authorized representative can make amendments to the authorization).

October 28, 1993

1. General Comments: List pertinent information which should be communicated to the office such as: posting new equipment, renovations of labs, pregnant workers, computer changes, name changes, etc.

m. Signature & Date of Principal User or Authorized Representative: Signature of PU needed to amend the authorization.

6. DEFICIENT AUDIT FORM: Given if the authorization is being improperly maintained for any of the following reasons:

a. Not maintaining correct inventory records.

b. Not within possession limits.

c. Failure to amend authorization to reflect changes in personnel, rooms, etc.

d. Failure to adhere to proper work practices.

ARTHUR G. SAMILJAN LTC, MS Health Physics Officer

HSHL-H-HP (385-111)

MEMORANDUM FOR

Encl.5.1

SUBJECT: Health Physics Office Audit of Radicactive Material Inventory for Authorization Number

1. This office is required to conduct periodic audits of the radicactive materials inventory for your Authorization.

2. You are scheduled to be audited on ______ at _____ hours. It is requested that the inventory officer for your Authorization be available to present inventory records and accompany the auditor during the inventory verification inspection.

3. If the date/time of the scheduled audit is not satisfactory, please contact Mr. David W. Burton, Chief, Radicactive Materials Control Branch, Telephone: 427-5104, to make alternate arrangements.

David W. Burton

DAVID W_ BURION C, Radioactive Material Control Br. Health Physics Office WRAMC Andit of Radioactive Material (In accordance with AR 40-37 & 40-61)

	Inspector:	D:	ata:		Authi-
			· · ·		ţ
1.	DA form 3862	[NQ]	[YES]	•	
2.	Within limits	[20]	[YES]		
3.	Inventory Contro	ol Offic Ro	er:		······································
4.	WRAMC Regulatio	n 45-10	[N0]	[YES]	. · ·
5.	WRAMC Authoriza	tion on	hand	[NO]	[YES]
б.	General Provisi	oas - Te	rms & Con	ditions	[NO] [YES]
7.	LSC - Source No	. & Loca	tion:	• .	
8.	WRAMC form 538	- curren	t [NO]	[YES]	
9.	Sick log [NC	I] [YES	1		
19.	Signs & Labels:			• •	
11.	Personnel (Add	litions)	(Deleti	.ors]	
12.	General Comment	:3:			

Principal User:

Encl5,2

Authorized Representative:

Signature

Date

		Farm	CONTROLLED SUBSTANCES STOCK RECORD							
STOCK NUMBER	TOCK NUMBER									
UNIT AS RECEIVED			CONVERSION FACTOR			ACCOUNTABLE UNIT				
DATE	DEBIT (Receipte)	DEBIT (VO.) OR CREDIT (RX) NO	CREDIT (Expenditures)"	BALANCE ON HAND	DATE	DEBIT (Receipte)	DEBIT (VO.) OR CREDIT (RX) NO.	CREDIT (Expenditures)	BAI ON	
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REPLACES DA FORM 8-235, 1 AUG 51, WHICH WILL BE USED.

NAME (Last, First, MI)

DUTY MAILING ADDRESS AND TELEPHONE NUMBER

As Principal User I have insured that the above named individual has received a briefing on the following subjects in accordance with Title 10 Code of Federal Regulations Part 19.

- 1. Walter Reed Army Medical Center's "NOTICE TO EMPLOYEES"
- 2. Form NRC-3
- 3. Title 10 Code of Federal Regulations Parts 19, 20 and 21.
- 4. Information concerning the storage, transfer and use of radioisotopes allowed under this authorization.
- 5. Authorization To Use Radioisotopes (WRAMC Form 1662R)
- 6. Ilazards and protective measures associated with isotope usage.
- 7. Procedures for requesting a report of exposure to radiation.

DATE ·	PRINTED NAME AND SIGNATU	JRE OF PRINCIPAL USER	AUTHORIZATION NUMBER
I have receive DATE	d and understand the above SIGNATURE	e listed information.	
WRAMC FORM 538	Enc 15,4	RADIATIO	N WORKER BRIEFING
	-		

HSHL-HP (385-11m)

Encl 5.5

MEMORANDUM FOR

SUBJECT: Isotope Audit of Authorization

1. On_____ an Isotope Audit of Author-

ization _____ was conducted by the Health Physics Office.

2. During the Audit, deficiencies were noted for the following reasons:

_____ Failure to maintain a central record of isotope receipt and usage.

_____ Isotope shipment delivered to authorization not noted on inventory records.

____ Incorrect entries in the records in regards to the amounts of materials present.

Not within possession limits.

____Failure to notify the Health Physics Office of changes in Authorization (MEMORANDUM stating Additions or Deletions) of personnel, rooms etc.

Failure to adhere to all work practices as listed in WRAMC Regulation 40-10 and/or Authorization Terms and Conditions. Specifically:

3. Request receipt of a MEMO listing corrected deficiencies, and/or procedures which will ensure future compliance with regulations.

DAVID W. BURION Chief, Radioactive Material Branch Health Physics Office

SEP 29 1993

License No. 08-01738-02 Docket No. 030-01317 Control No. 117725

Department of the Army Walter Reed Army Medical Center ATTN: Major General Ronald R. Blanck Commanding Officer Washington, DC 20307-5001

Dear Major General Blanck:

This is in reference to your application dated January 21, 1993 and a letter dated September 9, 1993 to renew License No. 08-01738-02. In order to continue our review, we need the following, additional information:

1. Although you have indicated that you use the criteria described in 10 CFR 33.15 to evaluate individual requests to use byproduct material, this criteria is not specific enough. We requested a copy of your authorized users application form in our August 11, 1993 letter. Please also provide the details of the minimum requested information that you would require of proposed users as stated in our August letter.

Please note that our indication that a condition will be put on your license limiting the holding time of byproduct material waste does not refer to those isotopes approved for decay-in-storage. You should indicate if the addition of such a condition on your license is acceptable or submit the information indicated in Information Notice 90-09, Attachment 1.

3. In answer to Question 4 of our August letter you have not been specific. We are interested in the minimum elements of your audits such as:

a) Scope of your review of inventory and survey records of investigators.

- b) Evaluation that you will perform of user and technician training through discussion and observation.
- c) Performance of independent surveys.

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ML 10

- d) Evaluation of compliance with the permit granted to the investigator and your safety manual.
- e) Provision for instructions to users and technical staff based on performance.

Please provide the details of your audit program.

4) You have indicated that your training program will be as described in Appendix A of Regulatory Guide 10.8; however, you have not answered our specific question of what records will be maintained. Please provide a list of the minimum information that will be recorded and identify each group of workers who will receive the training.

We will continue our review upon receipt of this information. Please reply in <u>duplicate</u> to my attention at the Region I office and refer to Mail Control No. 117725. If you have any technical questions regarding this deficiency letter please call me at (215) 337-5303.

Sincerely,

Original Signed By: Thomas K. Thompson

Thomas K. Thompson Senior Health Physicist Nuclear Materials Safety Branch Division of Radiation Safety and Safeguards

DRSS:RI Thompson/smh

9/29/93

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DEPARTMENT OF THE ARMY WALTER REED ARMY MEDICAL CENTER

WASHINGTON, DC 20307-5001



REPLY TO ATTENTION OF:

September 9, 1993

Health Physics Office

SUBJECT: Additional Information for Review of Renewal of U.S. Nuclear Regulatory Commission License No. 08-01738-02, mail control No. 117725

Nuclear Materials Safety Branch Division of Radiation Safety and Safeguards ATTENTION: Mr. Thomas K. Thompson U.S. Nuclear Regulatory Commission, Region I 475 Allendale Road King of Prussia, Pennsylvania 19406-1415

Dear Mr. Thompson:

In response to your letter of August 11, 1993, pertaining to the renewal of License No. 08-0738-02, Control No. 117725, the following additional information is provided:

a. The Radiation Control Committee (RCC) follows the criteria set down in 10 CFR 33.15 for evaluating physicians and other individuals to use radioactive material for nonhuman uses. After evaluations have been completed using the aforementioned criteria and additional information, the RCC makes a final decision to approve or disapprove an individual as an authorized user.

Information Notice 90-09 has been carefully reviewed. It b. does not state that license renewals not having an Interim Waste Storage Plan will have a condition placed on it which will only allow storage of LLW for a rolling two year period. It does state however, that "not all licensees who will need to store LLW onsite will need amendments to their licenses to do so". Our existing license has no condition limiting storage of radioactive material or waste, except by total activity. We intend to maintain our total inventory, to include storage of waste, below existing A rolling two year LLW storage condition will conflict limits. with our NRC approval for decay in storage of materials with halflives of up to 90 days. This requires us to hold some waste for a minimum of 2.5 years with no upper limit specified. Our waste is processed and stored in a decommissioned research reactor building which is solely occupied and secured by the Health Physics Office. The waste consist of dry, solid lab material, which is compacted into 55-gallon steel drums properly labeled and ready for disposal. It is stored under dry, temperature controlled conditions on fourlevel warehouse racks, and secured in a locked building surrounded by a locked perimeter fence. This facility has capacity to safely hold 500 drums.

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117725

SEP 1 7 1993

c. Our request for a case by case exemption from the requirements of 10 CFR 35 Subpart J is hereby withdrawn.

d. Radiation safety office audits of the performance of radioactive material authorizations are conducted semiannually. The elements of each audit include compliance with Army and hospital regulations, terms and conditions of the NRC license, proper posting of signs and labels, activity on hand, location, inventory records, logs, procedures, and required personnel actions.

e. All protocols for the use of unbound radioactive iodine involve less than 10 mCi per experiment; however, iodination procedures are required to be performed in a designated glove box which is inside a chemical fume hood. Exhaust is pulled through a charcoal filter and HEPA filter before venting to the outside. The hood exhaust air and room air are periodically monitored to ensure compliance with federal standards. All nonhuman use labs use less than 100 mCi at any one time. Nuclear Medicine is the only location where quantities greater than 100 mCi are handled. One compactor is used at the Health Physics waste processing facility to compact dry, solid LLW in 55-gallon drums. The facility is secured by the Health Physics Office and routinely surveyed for contamination. The compactor is exhausted through a HEPA particulate filter and charcoal cartridge air samples are used to monitor the exhaust air for volatile gases.

f. The model training program that was published in Appendix A to Regulatory Guide 10.8 Revision 2 will be established for all radiation workers. Records will be maintained to demonstrate compliance with applicable regulations.

g. Animal holding facilities are maintained in clean areas. Animals are taken from the holding facility to a restricted area by authorized users for the introduction of radioactive material. Animals are then sacrificed, placed in a marked freezer, and picked up by Health Physics Office for appropriate disposal. Protocols requiring the holding of animals containing radioactive material greater than exempt quantities will include provisions to ensure that the holding facility is secured from unauthorized access. Only authorized users will handle animals, animal wastes and carcasses. Cages will be cleaned and decontaminated by authorized users to ensure proper disposal of radioactive material and that they are free of radioactive contamination.

h. Trigger levels for removable contamination will be >50% and >100% of Reg Guide 8.23, Table 2 limits. Trigger levels for radiation levels will be 2 times background or 1 mR/hr for gamma and 2 mR/hr or 25% of 10 CFR 20.101(a) limits.

i. Our request for authorization to decay in storage I-125 LLW for 5 half-lives rather than 10 half-lives is hereby withdrawn.

j. Amendment No. 63, dated June 22, 1993, added the Gillette building to our license. See enclosure.

k. It has been noted that M.1 and M.2 of Reg Guide 10.8, Revision 2 are missing some required information.

1. Minimum requirements for surveys in non-medical use areas will be determined by types and quantity of material. For gamma and high energy beta emitting material the users will survey daily with G-M survey meters. Health Physics will survey weekly when ≥ 200 uCi is used at any one time and monthly when <200 uCi is used. For soft beta emitting material the users will perform daily wipes at the end of each day of use when using >100 uCi at any one time. Health Physics will survey weekly when ≥ 200 uCi is used at any one time. Health Physics will survey weekly when ≥ 200 uCi is used at any one time and monthly when <200 uCi is used at any one time.

I hope the above information adequately addresses your concerns pertaining to the renewal of our broad scope license. Please contact the undersigned at (301) 427-5161 if further information is required.

Enclosure as ARTHUR G. SAMILJAN Lieutenant Colonel, U.S. Army Chief, Health Physics Office

U.S. NUCLEAR REGULATORY COMMISSION

MATERIALS LICENSE

Amendment No. 63

1

PAGE

tuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974 (Public Law 93-438), and Titl add of Federal Regulations, Chapter I, Parts 30, 31, 32, 33, 34, 35, 39, 40 and 70, and in reliance on statements and representations hereit made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess, and transfer byproduct, source, and sj nuclear material designated below; to use such material for the purpose(s) and at the place(s) designated below; to deliver or transfer such ma to persons authorized to receive it in accordance with the regulations of the applicable Part(s). This license shall be deemed to contain the cond specified in Section 183 of the Atomic Energy Act of 1954, as amended, and is subject to all applicable rules, regulations and orders of the Nt Regulatory Commission now or hereafter in effect and to any conditions specified below.

Licensee		In accordan March 26, 1	ce with 993,	h the letter dated
Walter Reed Army Medical Cente	er (WRAMC)	its entiret	9 to r	ead as follows:
² Washington, D.C. 20307-5001		4. Expiration date	Apri]	30, 1993 (Extended)
•	·	5. Docket or Reference No.	030-0	1317
6. Byproduct, source, and/or special nuclear material	7. Chemical and form	l/or physical	8.	Maximum amount that license may possess at any one time under this license
A. Any byproduct material with atomic numbers 1-83	A. Any		Α.	400 millicuries of e radionuclide with a possession limit of
B. Iodine 131 C. Xenon 133 D. Krypton 85	B. Any C. Any D. Any		B. C. D.	2 curies 2 curies 1 curies
E. Gold 198 F. Phosphorus 32 G. Carbon 14 H. Iodine 125	E. Any F. Any G. Any H. Any		E. F. G. H.	l curie 2 curies 2 curies 1 curie
I. Iridium 192 J. Chromium 51 K. Sulfur 35	I. Any J. Any K. Any	. *	I. J. K.	750 millicuries 1 curie
L. Hydrogen 3 M. Molybdenum 99	L. Any M. Molybdenu Technetiu Generator	um 99/ um 99m °s	L. M.	23 curies
N. Technetium 99m O. Strontium 90 P. Cesium 137	N. Any O. Sealed so P. Sealed so	ources ources	N. 0. P.	23 curies
Q. Gadolinium 153 R. Iodine 125	Q. Sealed so R. Sealed so (Norland Model 178	purces purces Inst. Co., 345914)	Q. R.	400 millicuries
S. Iodine 125	S. Sealed so (3M Compa	ources any seeds)	s.	500 millicuries
T. Iodine 125	T. Sealed so (AECL Moo C324, or Model IMO	burces dels C235 or Amersham Corp. C.P2)	т. С	4 sources, not to ex 300 millicuries each
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		License number		-19
MATERIALS LIC	ENSE	Docket or Reference nu	08-01738-02	
SUPPLEMENTARY	SHEET		020 01217	
	· · ·		130-0131/	
	•		Amendment No.	
(Items 6., 7. & 8. continued)				
6. Byproduct, source, and/or	7. Chemical and/or	physical 8.	Maximum amoun	t that
special nuclear material	form		licensee may p any one time (posses under
			license	
U. Cesium 137	U. Sealed sources	υ.)	بع ۲	
V. Cobalt 60	V. Sealed sources	V.		7
W. Americium 241	W. Any	. W. ji	100 microcurio	es
X. Americium 241	X. Sealed sources	<u>∲ a d</u> _		
		the second s	قى تىرىيەت مىيىيە م	
Y. Nickel 63	Y. Sealed sources a	and foils Y. 1	curie	•
Z. Iodine 129	Z. Sealed sources	Z. 1	curie	
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CC. Uranium depleted in	CC. Plated Metal		400 kiloaram	s
Uranium 235			and the second	
DD. Americium 241	DD. Sealed sources	DD.	;	
LL. LESIUM 13/	EE. Sealed source	EE.	• * *	
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FF. Cesium 137	FF. Sealed sources	FF.		Nices and
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9. , Authorized use				<u>.</u>
			• • •	
A. through [. Medical researc	n, diagnosis, and ther n CER 30 4	apy; research a	nd developmen	it
U. through Z. Research and de	velopment as defined i	n 10 CFR 30.4:	teaching.	
AA. and BB. Teaching and la	boratory research.			
LL. Shielding. DD. Standards and metanonce of		~		
EE. In an	nut C62.	Ifor ca	libration of	
instruments.	1			· ·
FF. Instrument calibration.		τ.		
	CONDITIONS			
	CONDITIONS	•		
10. Location of use: Walter	Reed Army Medical Cent	er, Washington.	D. C.;	
WRAMC Forest Glen Section	and Annex, Silver Spr	ing, Maryland;	Walter Reed A	rmy
Institute of Research Ania	nal Holding Facility,	Fort Meade, Mar	yland; U.S. A	rmy
and IIS Army Institute of	Department of Patholo F Dental Research Fact	gy, rort Meade, lity Fort Mood	Maryland; • Maryland:	
Rickman Building. 13 Taft	Court. Rockville Mar	vland: Kev West	Research Cen	ter.
9620 Medical Center Drive	, Rockville, Maryland:	and Gillette B	uilding, 270	Resea
Center, 1413 Research Bou	levard, Rockville, Mar	yland.		
11 Radiation Safaty Officers	ITC Anthun C Camili			
11. Radiation Safety Officer:	LTC Arthur G. Samilj	an.		
11. Radiation Safety Officer:	LTC Arthur G. Samilj $\mathcal{E}_X \mathcal{7}$	dn.		e
11. Radiation Safety Officer:	LTC Arthur G. Samilj $E_X Z$	dn.		÷

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			License number		
		MATERIALS LICENSE	08-01738-02 Docket or Reference number		
	ł	SUPPLEMENTARY SHEET	030-01317		
			Arendment No. 62		
/[tinua		Amenament_Nob3		
נכטוו	tinue				
12.	Α.	Licensed material shall be used b designated by the licensee's Radi Chairman.	y, or under the supervision of, individuals ation Safety Committee, Col. Joan T. Zajtchu		
	Β.	The use of licensed material in o in Section 35.2 of 10 CFR Part 35	r on humans shall be by a physician as defin •		
	C.	Physicians designated to use lice training criteria established in	nsed material in or on humans shall meet the 10 CFR Part 35, Subpart J.		
13.	Expe used	rimental animals administered lice I for human consumption.	nsed materials or their products shall not b		
14.	In lieu of using the conventional radiation caution colors (magenta or purple on yellow background) as provided in Section 20.203(a)(1), of 10 CFR Part 20, the licensee is hereby authorized to label detector cells and cell baths, containing licensed material and used in gas chromatography devices, with conspicuously etche or stamped radiation caution symbols without a color requirement.				
15.	Dete only whic	ctor cells containing a titanium t be used in conjunction with a pro h prevents foil temperatures from	ritide foil or a scandium tritide foil shall perly operating temperature control mechanis exceeding that specified by the manufacturer		
16.	Notw for Admi Drug	withstanding the requirements of 10 medical use any byproduct material nistration has accepted a "Notice " (IND).	CFR 35.49 (a) and (b), the licensee may use or reagent kit for which the Food and Drug of Claimed Investigational Exemption for a N		
17. _.	The 10 C	licensee may transport licensed ma FR 71, "Packaging and Transportati	terial in accordance with the provisions of on of Radioactive Material."		
18.	If o limi 0767 dete by t <u>Poss</u>	only a single radionuclide specified t is the quantity specified in <u>Sch</u> . If two or more radionuclides ar ermined as follows: the sum of the he quantities of those radionuclid <u>ession Limits</u> , NUREG-0767 shall no	d in NUREG 0767, is possessed, the possession edule of Limiting Possession Limits, NUREG- e possessed, the possession limit for each i quotients of the quantities possessed divid es specified in the <u>Schedule</u> of <u>Limiting</u> t exceed unity.		
19.	The less	licensee is authorized to hold rad than 90 days for decay-in-storage	ioactive material with a physical half-life before disposal in ordinary trash provided:		
	Α.	Radioactive waste to be disposed minimum of 10 half-lives.	of in this manner shall be held for decay a		

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1.		License number
-	MATERIALS LICENSE	08-01738-02 Docket or Reference number
	SUPPLEMENTARY SHEET	030-01317
•)	Amendment No. 63

continued)

CONDITIONS

- B. Before disposal as normal waste, radioactive waste shall be surveyed to determine that its radioactivity cannot be distinguished from background. All radiation labels shall be removed or obliterated.
- C. Generator columns shall be segregated so that they may be monitored separately to ensure decay to background levels prior to disposal.

Except as specifically provided otherwise in this license, the licensee shall conduct its program in accordance with the statements, representations, and procedures contained in the documents, including any enclosures, listed below. The Nuclear Regulatory Commission's regulations shall govern unless the statements, representations and procedures in the licensee's application and correspondence are more restrictive than the regulations.

Α.	Application dated July 18, 1979
Β.	Letter dated January 13, 1984
C.	Letter dated May 8, 1987
D.	Letter dated March 16, 1988
ε.	Letter dated March 28, 1988
F.	Application dated August 5, 1988
G.	Letter dated September 23, 1988
Η.	Letter dated July 28, 1989
I.	Letter dated September 12, 1989
J.	Letter dated January 19, 1990
κ.	Letter dated July 16, 1990
Ł.	Letter dated March 15, 1991
Μ.	Letter dated July 11, 1991
N.	Letter dated April 8, 1992
0.	Letter dated August 4, 1992
Ρ.	Letter dated November 24, 1992
Q.	Letter dated March 26, 1993

JUN 2 2 1993

For the U.S. Nuclear Regulatory Commission

Βv Nuclear Materials Safety Branch

Region I King of Prussia, Pennsylvania 19406

AUG 1 1 1993

License No. 08-01738-02 Docket No. 030-01317 Control No. 117725

Department of The Army Walter Reed Army Medical Center ATTN: Major General Ronald R. Blanck Commanding Officer Washington, D.C. 20307-5001

Dear Major General Blanck:

2.

This is in reference to your application dated January 21, 1993 to renew License No. 08-01738-02. In order to continue our review, we need the following additional information:

1. Please submit the Radiation Safety Committee's (RSC) procedures and criteria for making safe evaluations of proposed uses of radioactive material that will demonstrate the Committee's process for obtaining permission to use radionuclides. A typical "application for authorization" for human and non-human use submitted to the Committee for review should as a minimum take into account the radionuclides, physical/chemical form, and maximum activities requested by the applicant, the applicant's training and experience with the nuclides requested, the training and experience of personnel working for the applicant, the use of the requested nuclide, the applicant's facilities and equipment, and any specific hazard in the operations with the radionuclides. You should submit an example of your authorized user application and approval forms.

Please review the enclosed Information Notice 90-09. You may wish to develop an Interim Waste Storage Plan at this time. If you do not wish to develop an Interim Waste Storage Plan, a condition will continue to be placed on your license that allows storage of LLW for a rolling two year period. Submittal of an Interim Waste Storage Plan amendment in accordance with Information Notice 90-09 would be required to remove this condition from your license.

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Department of The Army

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3. In your request for case by case exemption from the requirements in Subpart J please confirm that exceptions are only made for unique/non-routine clinical studies that are within the physician's field of expertise and exceptions are not used to circumvent the Part 35, Subpart J requirements for routine studies. Please also submit the minimum training and experience criteria that you will use for these exceptions.

-2-

- 4. Please describe in greater detail the frequency and elements of your radiation safety office audits of the performance of individual authorized investigators that will assure that your program is operating in accordance with your procedures.
- 5. Please describe any special use facilities and equipment such as iodination facilities > 10 millicuries, large use labs > 100 millicuries or compactors.
- 6. What records will you maintain of training and testing of personnel? Please also confirm that your training program will include instructions on emergency procedures and include provisions for periodic exercises.
- 7. Regarding your use of animals in research:
 - a. Please describe the animals' housing facilities or the criteria that the RSC will follow in approving animal housing facilities.
 - b. Please submit a copy of instructions provided to animal caretakers for handling of animals, animal wastes and carcasses.
 - Please submit a copy of instructions on cleaning and decontamination of animal cages.
 - d. Please submit your procedures for ensuring that animal rooms will be locked or otherwise secured unless attended by authorized users of byproduct material.
- 8. Please specify your trigger or action levels for removable contamination and radiation levels when performing radiation surveys.
- 9. With regard to your request for authorization to decay in storage materials with halflives of less than 90 days for only 5 half-lives rather than 10 half-lives please provide the following additional information:
 - a. For all byproduct materials with half-lives of greater than or equal to 65 days, you must specifically identify the isotopes desired and describe the instrumentation and monitoring procedures that will be used to determine that the waste is free of radioactive contamination at the end of the storage period.

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Department of The Army

b. For specific byproduct materials to be held only 5 half-lives, identify these separately and indicate how you will assure that the waste will contain less than the quantity of radioactive material specified in 10 CFR 20, Appendix C per waste container when placed in storage. Use the 1/R rule for multiple isotopes.

10. In Item 3 of your application you have added the Gillette building. Please provide a description of what byproduct materials uses and quantities will be used in this facility. You should indicate approximately how many laboratories you plan to establish and their general location.

11. Please note that M.1 and M.2 of Regulatory Guide 10.8, Revision 2 are missing some required information. M.1 should include the expiration date and M.2 should include expiration date and lot number.

12. Your described area radiation and contamination surveys may not be adequate for your non-medical use program. Please provide greater detail on your minimum requirements for surveys in the rest of your broad scope program. You should develop a plan for minimum survey frequencies for laboratories based on categories of risk as determined by types, quantities, and forms of byproduct material that will be handled. Please also include your action limits for survey results.

We will continue our review upon receipt of this information. Please reply in <u>duplicate</u> to my attention at the Region I office and refer to Mail Control No. 117725. If you have any technical questions regarding this deficiency letter please call me at (215) 337-5303.

In order to continue prompt review of your application, we request that you submit your response to this letter within 30 calendar days from the date of this letter.

Sincerely,

Original Signed By: Thomas K. Thompson

Thomas K. Thompson Senior Health Physicist Nuclear Materials Safety Branch Division of Radiation Safety and Safeguards

Enclosure: Information Notice 90-09

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Department of The Army

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DRSS:RI Thompson/cmm

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FEB 16 1993

Docket No.030-01317License No.08-01738-02Control No.117725

Department of the Army Walter Reed Army Medical Center ATTN: Major General Ronald R. Blanck Commanding Officer Washington, DC 20307-5001

Dear Major General Blanck:

Subject: LICENSE RENEWAL APPLICATION

This is to acknowledge receipt of your application for renewal of material(s) license identified above. Your application is deemed timely filed, and accordingly, the license will not expire until final action has been taken by this office.

Any correspondence regarding the renewal application should reference the control number specified above.

Sincerely,

Original Signed By: Shery! Villar

Sheryl Villar, Chief Licensing Assistance Section Division of Radiation Safety and Safeguards

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February 16, 1993

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30-01317



DEPARTMENT OF THE ARMY OFFICE OF THE SURGEON GENERAL 5109 LEESBURG PIKE FALLS CHURCH, VA 22041-3258

February 04, 1993



REPLY TO ATTENTION OF Preventive Medicine

Consultants Division

US Nuclear Regulatory Commission Region I 475 Allendale King of Prussia, Pennsylvania 19406

Dear Sir/Ma'am:

Enclosed are two copies of a request to renew in its entirety Byproduct Material License Number 08-01738-02, Walter Reed Army Medical Center, Washington, DC.

Recommend approval.

Should the need arise, you may speak to me by telephoning 703-756-0132.

Sincerely,

Peter H. Myers Colonel, W.S. Army Radiological Hygiene Consultant

Enclosure

CF: U.S. Army Environmental Hygiene Agency, Attention: Health Physics Division, Aberdeen Proving Ground, MD 21010-5422

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DEPARTMENT OF THE ARMY WALTER REED ARMY MEDICAL CENTER WASHINGTON, DC 20307-5001



HSHL-HP (385-11m)

21 January 1993

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MEMORANDUM THRU Commander, HQ, U,S. Army Health Services Command, 29 JAN 93 ____ATTN: HSCL-P, Fort Sam Houston, TX 78234-6000

FOR Office of The Surgeon General, ATTN: DASG-PSP, Skyline Plaza 5, 5111 Leesburg Pike, Falls Church, VA 22041-3258

SUBJECT: NRC License Renewal

1. The enclosed NRC License renewal for Walter Reed Army Medical Center is provided IAW TB Med 525.

2. POC for this office is Mr. David Burton who can be reached at (301) 427-5107/5104 or AUTOVON 291-5107/5104.

ARTHUR G. SAMULJAN LTC, MS Chief, Health Physics Office

EXHI	BIT 1 030-01317	
NOC POPAL 313	U.B. HUCLEAR REGULATORY COMMISSION APPROVED BY ONE	
10 CFR 30, 32, 33, 34. 35 June 40 APPLICATION FC	OR MATERIAL LICENSE	
INSTRUCTIONS: SEE THE APPROPRIATE LICENSE APPLICATION GUIDE FO OF THE ENTIRE COMPLETED APPLICATION TO THE NRC OFFICE SPECIFIED	IR DETAILED INSTRUCTIONS FOR COMPLETING APPLICATION SEND TWO COPIES D BELOW.	
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EXH-3

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ITEM #3: ADDRESS(ES) WHERE LICENSED MATERIAL WILL BE USED OR POSSESSED

Locations of use: Walter Reed Army Medical Center, Washington, D.C.; WRAMC Forest Glen Section and Annex, Silver Spring, Maryland; Walter Reed Army Institute of Research Animal Holding Facility, Fort Meade, Maryland; U.S. Army Medical Laboratory, WRAMC Department of Pathology, Fort Meade, Maryland; U.S. Army Institute of Dental Research Facility, Fort Meade, Maryland; Rickman Building, 13 Taft Court, Rockville, Maryland; Key West Research Center, 9620 Medical Center Drive, Rockville, Maryland; and The Gillette Building, 1413 Research Boulevard, Rockville, Maryland.

ITEM #5 RADIOACTIVE MATERIAL and ITEM #6 PURPOSE(S) FOR WHICH LICENSED MATERIAL WILL BE USED

CHEMICAL AND MASS NUMBER	CHEMICAL AND PHYSICAL FORM	MAXIMUM ACTIVITY	AUTHORIZED_USE
A. Any byproduct material with atomic numbers 3-83	A. Any	A. 400 mCi of each radionuclide with a total possession limit of	A. through R. Medical research, diagnosis, and therapy; research and development as defined in
		26 curies	10 CFR 30.4
B. Iodine 131	B. Any	B. 2 curies	
C. Xenon 133	C. Any	C. 2 curies	
D. Krypton 85	D. Any	D. 1 curie	
E. Phosphorus 32	E. Any	E. 2 curies	
F. Carbon 14	F. Any	F. 2 curies	
G. Iodine 125	G. Any	G. <u>1</u> curie	·
H. Iridium 192	H. Any	Η.	• •
I. Chromium 51	I. Any	I. 750 mCi	
J. Sulfur 35	J. Any	J. 1 curie	
K. Hydrogen 3	K. Any	K. 5 curies	
L. Molybdenum 99	L. Molybdenum 99/Technetium	L. 23 curies	
	99m Generators		
M. Technetium 99m	M. Any	M. 23 curies	
N. Strontium 90	N. Sealed sources	N .	
0. Cesium 137	0. Sealed	0.	·
	Sources		· · ·
P. Gadolinium 153	P. Sealed —	P.	
	sources	how we have	
· *			

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CHEMICAL AND MASS NUMBER	CHEMICAL AND PHYSICAL FORM	MAXIMUM ACTIVITY	AUTHORIZED U
Q. Iodine 125	Q. Sealed sources	Q. 4 sources, not to exceed	1
	(Norland model	300 mCi each	
	178A591A, AECL		
	Models C235 or		
. •	C324, or Amersh	am	
D Talina 105	Corp. Model IMC		
R. Iodine 125	K. Sealed	R. 500 mC1	
	(3M Company see	Aer / Ish	
S Cesium 137	S. Sealed	S	S through X
	sources	5.	Research and
T. Cobalt 60	T. Sealed	т.	development as
	sources		defined in 10 CFR
U. Americium 241	U. Any	U. 100 uCi 🛶	30.4; teaching
V. Americium 241	V. Sealed	V. 1	`
	sources	· .	
W Nickel 63	W. Sealed-1	W 1 curie	
N. MICKEL 05	sources		
X	and foils		
X. Lodine 129	X. Sealed	X. I Curie	
V Thorium	V Any	V 5 kome	V and 7 Teaching
Z. Uranium	7. Anv	7.50 kgms	and laboratory
		1	research
AA. Uranium depleted	AA. Plated	AA. 400 kgms	AA. Shielding
in Uranium 235	metal	-	
BB. Americium 241	BB. Sealed	BB'	BB. Standards and
00 0ocium 127	sources	<u> </u>	reference sources
cc. cestum 137	cc. Sealed	LL. 3	Tretrumont Corp
	Source		Model 8150-150 CS
• · · ·		κ.	for calibration of
	· · · · · · · · · · · · · · · · · · ·		instruments
DD. Cesium 137	DD. Sealed	DD.	DD. instrument
	sources 🧹		calibration
		"hná/"	

ITEM #7

7.1 and 7.2 Licensed material shall be used by or under the supervision of individuals designated by the Walter Reed Army Medical Center Radiation Control Committee. The training and experience of authorized users will be evaluated using the criteria in 10 CFR 35, Subpart J. The Radiation Control Committee may grant case-by-case exceptions.

Ey 2

CHEMICAL AND MASS	CHEMICAL AND PHYSICAL FORM	MAXIMUM <u>ACTIVITY</u>	AUTHORIZED USE
Q. Iodine 125	Q. Sealed sources (Norland model 178A591A, AECL Models C235 or	Q. 4 sources, not to exceed 300 mCi each	
•	C324, or Amersh	am	
•	Corp. Model IMC	L.P2)	•
R. Iodine 125	R. Sealed sources	R. 500 mCi	
	(3M Company see	ds)	
S. Cesium 137	S. Sealed	S.	S. through X. Research and
T. Cobalt 60	T. Sealed	Τ.	development as defined in 10 CFR
II Americium 241	U. Anv	U. 100 uCi	30.4: teaching
V. Americium 241	V. Sealed	v.	(
	n sources		
W. Nickel 63	W. Sealed Sources	W. 1 curie	·
	and foils		
X. Iodine 129	X. Sealed	X. 1 curie	
V Thorium	V Anv	V 5 kams	Y. and Z. Teaching
Z. Uranium	Z. Any	Z. 50 kgms	and laboratory research
AA. Uranium depleted	AA. Plated	AA. 400 kgms	AA. Shielding
BB. Americium 241	BB. Sealed	BB.	BB. Standards and
CC. Cesium 137	cc. Sealed	CC. 5	CC. In an Eberline
	source	ł	Instrument Corp. Model 8150-150 CS for calibration of
DD. Cesium 137	DD. Sealed	DD.	DD. instrument calibration
	· · · · · · · · · · · · · · · · · · ·		

ITEM #7

7.1 and 7.2 Licensed material shall be used by or under the supervision of individuals designated by the Walter Reed Army Medical Center Radiation Control Committee. The training and experience of authorized users will be evaluated using the criteria in 10 CFR 35, Subpart J. The Radiation Control Committee may grant case-by-case exceptions.

7.3 Radiation Safety Officer: Lieutenant Colonel Arthur G. Samiljan, Chief, Health Physics Office, Walter Reed Army Medical Center. Training and experience included at ATT 7.3.

ITEM #8 We will establish and implement the model training program that was published in Appendix A to Regulatory Guide 10.8, Revision 2, and have appended a table ATT 8.1 that identifies the groups of workers who will receive training and the method and frequency of training.

ITEM #9

9.1 Enclosed at ATT 9.1 are drawings of the nuclear medicine area, a detailed drawing of the nuclear pharmacy and the source storage area in radiation therapy. The research laboratories at Walter Reed are basic biomedical research facilities with impervious floors, walls and counter tops and whatever equipment is needed for the specific research and isotopes involved. All isotope laboratories are evaluated by the Health Physics Office and approved by the Radiation Control Committee.

9.2 We will establish and implement the model procedure for calibrating survey instruments that was published in Appendix B to Regulatory Guide 10.8, Revision 2.

9.3 We will establish and implement the model procedure for calibrating our dose calibrator that was published in Appendix C to Regulatory Guide 10.8, Revision 2.

9.4 We will establish and implement the model personnel external exposure monitoring program published in Appendix D to Regulatory Guide 10.8, Revision 2, with the exception that some of our personnel who have been shown to receive much less than the ALARA limit have their monitors changed on a quarterly basis.

9.5 NA

9.6 See ATT 9.6

ITEM #10

10.1 The Charter for the Radiation Control Committee and the delegation of authority for the Radiation Protection Officer are addressed in an ARMY Technical Bulletin (TB MED 525). The duties of each are included at ATT 10.1.1. Walter Reed AMC also has a regulation which lists all standing committees at WRAMC including the Radiation Control Committee. The Composition of the RCC will include:

Deputy Commander (Chairman) Chief, Department of Medicine Chief, Department of Nursing Chief, Department of Pathology and Area Lab Services Chief, Department of Radiology Chief, Radiation Therapy Service Chief, Nuclear Medicine Service Health Physics Officer (RPO) Senior Nuclear Pharmacist Assistant Health Physics Officer (alternate RPO) (Recorder) Director, WRAIR Radiation Safety Officer, WRAIR Radiation Protection Officer, AFIP

We will also include any others required by 10 CFR 35. The orders delegating authority to Lieutenant Colonel Samiljan are included at ATT 10.1.2.

10.2 We will establish and implement the model ALARA program published in Appendix G to Regulatory Guide 10.8, Revision 2.

10.3 We will establish and implement the model procedure for leak-testing sealed sources that was published in Appendix H to Regulatory Guide 10.8, Revision 2.

10.4 We will establish and implement the model safety rules published in Appendix I to Regulatory Guide 10.8, Revision 2.

10.5 We will establish and implement the model spill procedures published in Appendix J to Regulatory Guide 10.8, Revision 2.

10.6 We will establish and implement the model guidance for ordering and receiving radioactive material that was published in Appendix K to Regulatory Guide 10.8, Revision 2.

10.7 We will establish and implement the model procedure for opening packages that was published in Appendix L to Regulatory Guide 10.8, Revision 2.

10.8 We will establish and implement the model procedure for a unit dosage record system that was published in Appendix M.1 to Regulatory Guide 10.8, Revision 2.

10.9 We will establish and implement the model procedure for a multidose vial record system that was published in Appendix M.2 to Regulatory Guide 10.8, Revision 2.

10.10 We will establish and implement the model procedure for measuring and recording molybdenum concentration that was published in Appendix M.3 to Regulatory Guide 10.8, Revision 2.

10.11 We will establish and implement the model procedure for keeping an inventory of implant sources that was published in Appendix M.4 to Regulatory Guide 10.8, Revision 2.

10.12 We will establish and implement the model procedure for area surveys that was published in Appendix N to Regulatory Guide 10.8, Revision 2.

10.13.1 We will collect spent noble gas in a shielded trap and monitor the trap effluent with an air contamination monitor that we will check regularly according to the manufacturer's instructions.

10.13.2 We will collect spent aerosol in a shielded, single-use trap.

10.13.3 We will follow the model procedure for calculating airborne effluent concentration that was published in Appendix 0.2 to Regulatory Guide 10.8, Revision 2.

10.13.4 We will calculate spilled gas clearance times according to the procedure that was published in Appendix 0.4 to Regulatory Guide 10.8, Revision 2.

10.14 We will establish and implement the model procedure for radiation safety during radiopharmaceutical therapy that was published in Appendix P to Regulatory Guide 10.8, Revision 2, except for the provision at ATT 10.14.

10.15 We will establish and implement the model procedure for radiation safety during implant therapy that was published in Appendix Q to Regulatory Guide 10.8, Revision 2.

10.16 General Safety Proceedures See ATT 10.16

ITEM #11

11.1 We will establish and implement the general guidance and model procedures for waste disposal that were published in Appendix R to Regulatory Guide 10.8, Revision 2, except for the provision to hold for decay-in-storage material with a physical half-life of less than 90 days, as previously approved by the NRC (see ATT 11.1.1, ATT 11.1.2, and ATT 11.1.3). We also generate a large volume of RIA waste at the Drug Testing Lab at Ft. Meade (25 drums per month and increasing) which we would like to be able to hold for decay for only 5 half-lifes and dispose of, if all other conditions are meet. This waste is mostly empty, washed test tubes which are only minimally contaminated prior to the decay in storage process. This waste is generated at a location were RIA kits are the only radioactive material use and the waste is kept segregated from all other laboratory waste in separate sealed 55 gal. drums.

11.2 See Item 11.1.

TRAINING AND EXPERIENCE OF AUTHORIZED RADIOISOTOPE USERS								
L NAME OF AUTHORIZED USER (Last, First, WI)						2. STATE OR TERRITORY IN WHICH LICENSED:		
SAMILJAN, ARTHUR G.					/ N	(ND. DDS. DVM. etc.)		
RANK/GRADE ORGANIZATION ORGAN			NIZATIONAL DIVISION BLDG. ROOM NO.			WRAME AUTHORIZATION NO.		
LTC WRAMC Hea		alth Physics Bldg 188 F		FGS	GS 221			
3. CERTIFICATION								
SPECIALTY BOARD			CATEGORY		MOI	MONTH AND YEAR CERTIFIED		
-								
4. FORMAL EDUCATION HIGHEST ACADEMIC DEGREE ATTAINED								
Higher Educational Institutions Attended			Type ai Program Pursued and Dores of Arrendance			Degree, Dialoma or Certificate Received and Date		
. <u>University of FL</u> <u>MS Env Eng (Rad H1th) MS/</u>								
b								
d.								
5. TRAINING RECEIVED IN BASIS RADIOISOTOPE HANDLING TECHNIQUES								
FIELD OF TRAINING		LOCATION AND DATESSI OF TRAINING finclude course title if knowni B		TYP:	E AND L ENC CTURE DRATORY URSES <i>Hours)</i> C	STH OF TRAINING SUPERVISED LABORATORY EXPERIENCE Hours/ D		
a RADIATIO	- RADIATION PHYSICS AND		University of Florida					
INSTRUME	NTATION		Kirtland AFB	, AFRRI		60	20	
5. RADIATIO	N PROTECTION		fl	· · ·		60	20	
C MATHEMA THE USE OF RADIO	TICS PERTAINING TO AND MEASUREMENT ACTIVITY		ţţ		1	00	20	
d. RADIATIC	N BIOLOGY		11			60	20	
• RADIOPH CHEMIST	ARMACEUTICAL RY		•					

WRAMC FORM 1643 PREVIOUS EDITIONS ARE OBSOLETE)

OVER

CURRICULUM VITAE

for

ARTHUR G. SAMILJAN, Lieutenant Colonel

DATE AND PLACE OF BIRTH:

YEARS OF ACTIVE MILITARY SERVICE: 20 years

<u>PRESENT ASSIGNMENT</u>: (21 Jun 91 to present) Chief, Health Physics Office; RPO Walter Reed Army Medical Center, Washington, DC 20307-5001

MILITARY EDUCATION (pertinent to radiation protection):

- Medical Effects of Nuclear Weapons Course, 8-12 Sep 86 Armed Forces Radiobiology Research Institute Bethesda, Maryland
- 2. Army Medical Department Physics and Military Medicine Course, 26-30 Oct 87 U.S. Army Environmental Hygiene Agency Aberdeen Proving Ground, Maryland

(included presentations on management of radiation protection programs and topical radiation protection issues)

- Radiological Hazards Associated with Depleted Uranium Munitions Course, 16-20 Nov 87
 U.S. Army, Belvoir Research, Development & Engineering Center, Fort Belvoir, Virginia
- 4. Laser Microwave Hazards Workshop, 25-29 Apr 88 U.S. Army Environmental Hygiene Agency Aberdeen Proving Ground, Maryland
- The Army Medical Department Radiation Health Sciences Course, 24-28 Oct 88
 U.S. Army Environmental Hygiene Agency Aberdeen Proving Ground, Maryland

(included presentations on management of radiation protection programs and topical radiation protection issues)

6. Senior Officer Nuclear Accident Course, 24-27 Apr 89 InterService Nuclear Weapons School Kirtland Air Force Base, New Mexico

MILITARY EDUCATION (continued):

- 7. Management of Radiation Accidents and Emergency Preparedness Training Course, 5-9 Jun 89 U.S. Army, Belvoir Research, Development & Engineering Center, Fort Belvoir, Virginia
- Nuclear Weapons Incident Seminar, 7-8 Mar 91 Naval Base Norfolk, Virginia
- Medical X-Ray Survey Techniques Course, 15-26 Apr 91 Academy of Health Sciences Fort Sam Houston, Texas

<u>CIVILIAN EDUCATION</u> (relative to radiation protection):

Graduate Study leading to Master of Science Degree in Environmental Engineering (emphasis in Health Physics) Aug 84 - Dec 85 University of Florida Gainesville, Florida

HEALTH PHYSICS EXPERIENCE:

 Nuclear, Biological, and Chemical Officer Mar 76 - Jun 77 44th Medical Brigade Fort Bragg, North Carolina

(included designing and supervising the training of 100 personnel in battle field radiation detection, survey techniques, monitoring, decontamination, and protection)

2. Nuclear, Biological, and Chemical Officer Jun 77 - Dec 78 5th General Hospital Bad Cannstatt, Germany

(included designing and supervising the training of 350 personnel in battle field radiation detection, survey techniques, monitoring, decontamination, and protection)

3. Manager, Department of the Army, Nuclear Test Personnel Review Jan 86 - Dec 87 Environmental Support Group Washington, DC

(included the identification, dose assessments, and notification of all Army personnel who participated in the atmospheric nuclear testing program from 1944 to 1963.

ATTACHMENT 7.3

4. Medical Health Physics Consultant Dec 87 - Jun 89 Headquarters, Army Materiel Command Office of the Command Surgeon Alexandria, Virginia

(included being the Commanding General's action officer for health aspects of ionizing and nonionizing radiation as applied to the command's workforce, and technical advisor on health hazard assessment of new materiel and to related materiel management processes)

5. Contract Manager, Johnston Island Plutonium Clean-up Project Jun 89 - Aug 90 Field Command Defense Nuclear Agency Johnston Atoll

(included planning, directing, and supervising the clean-up project, conducting radiological site surveys, and establishing procedures for packaging, storing, and disposal of radioactive waste)

6. Chief, Operations Branch/Assistant RPO Aug 90 - Jun 91 Health Physics Office Walter Reed Army Medical Center Washington, DC

(included reviewing x-ray compliance surveys and radioisotope laboratory room surveys, monitoring radiation therapy procedures, performing x-ray shielding evaluations and dose assessments, and assisting the RPO in the preparation and execution of all radiation protection policies in support of the medical center's NRC license, and ionizing and nonionizing radiation producing devices)

7. Chief, Health Physics Office/Radiation Protection Officer Jun 91 - Present Health Physics Office Walter Reed Army Medical Center Washington, DC

(Manage 20 health physicists and health physics technicians providing radiation safety support to Walter Reed Army Medical Center, Walter Reed Army Institute of Research, Armed Forces Institute of Pathology, and other federal agencies in the Washington, DC regional area. Executive agent for two NRC Licenses.)
TTA	8.	1

GROUP	METHOD	FREQUENCY
Authorized Users	Lecture	Annually
Ward Nursing Staff	Lecture or Video	Annually
Radiation Therapy	Lecture or Video	Annually
Housekeeping	Lecture or Video	Annually
Maintenance	Lecture or Video	Annually
Security	Lecture or Video	Annually
Firefighters	Lecture or Video	Annually

ATT 9.6

In addition to the Facilities described in Item 9.1 the following equipment and control systems are available as required for the safe handling of radioactive material:

o Remote handling equipment including jaws, vices, forceps, and remote handling tongs of varying lengths.

o Storage containers including steel safes, lead lined boxes, steel drums, lead pigs, and lead storage containers both fixed and movable.

o Shielding including movable lead shields for shielding patients, L shields both lead and plastic, and shielding materials (e.g. lead bricks, lead shot, lead wool, plastic sheet etc.).

o Radiation measuring and counting equipment including liquid scintillation counting systems, gamma well counting systems, alpha gas flow counting systems, portable surveys instruments including GM, Ion chamber, and Scintillation detectors.

o Ventilation Control systems including Fume hoods with HEPA particulate filters, and iodination filter boxes with charcoal filters and charcoal sampling systems for use with volatile isotopes. f. The Radiation Control Committee will--

 (1) Meet at least quarterly and at the call of the chairman.
 (2) Recommend approval or disapproval of each type of radiation source from the standpoint of radiological health and safety of patients and working personnel and other factors established for the medical use of these sources.

(3) Recommend individual users for each type of procedure with each individual radionuclide and ensure that any physician authorized to use radioactive material in humans meets the criteria specified in part 35, title 10, Code of Federal Regulations (10 CFR 35). Recommendations will be consistent with the limits and conditions of the NRC license and DARA.

(4) Recommend individual pharmacists and individual compounding protocols for compounding radioactive drugs (radiopharmaceuticals) or radiopharmaceutical kits to be administered to patients (if the procedure is permitted to be performed by NRC license or DARA).

(5) Prescribe, if required, special conditions to be permitted in the work area and special procedures or work rules for use of radiation sources.

(6) Formulate and review the radiation protection training program.

(7) Monitor radiation exposures within the command and recommend actions to keep exposures as low as is reasonably achievable (ALARA). As a minimum, the collective dose to all radiation workers, average dose, and highest individual dose will be reviewed at quarterly meetings.

(8) Formally review, at least annually, the policies and procedures established to maintain low exposures.

(9) Approve the training and experience of the nuclear pharmacist.

g. The RPO, in addition to the responsibilities in 10 CFR 35, 21, will--

(1) Exercise staff supervision over the Radiation Protection Program.

(2) Provide consultation and advice on the degree of hazards associated with radiation and effectiveness of control measures.

(3) Advise and assist the commander and radiation workers in all matters pertaining to radiation protection, including instructing and training of workers (users) and others in the safe use of protective equipment and radiation producing devices.

(4) Ensure all radioactive materials are properly receipted, used, stored, handled, shipped, and disposed of according to applicable directives.

(5) Formulate and implement the Radiation Protection Program.

(6) Formulate, implement, and supervise an active, aggressive, documented program designed to keep radiation doses to levels which are ALARA. (7) Review the current and proposed uses of radiation sources for compliance with regulations and approved procedures.

(8) Review standing operating procedures for operations involving sources of ionizing radiation before submission to the Radiation Control Committee.

(9) Review procurement of all radioactive materials to ensure compliance with NRC licenses or DARA conditions.

(10) Ensure radiation survey and/or detection instruments used in radiation protection are properly calibrated and are available to radiation workers.

(11) Ensure all radiation shields, containers, and handling equipment are maintained in satisfactory condition.

(12) Ensure the required radiation warning signs are posted.

(13) Ensure that a physical inventory of radioactive materials is conducted every 3 months.

(14) Ensure that radiation surveys are performed at least quarterly and that leak tests are performed semiannually (NRC Reg Guide No. 8.23).

(15) Evaluate hazard potential and adequacy of protective measures for existing and proposed operations.

(16) Monitor situations where higher than normal levels of radiation or radioactive contaminants are suspected.

(17) Investigate radiation accidents and incidents and overexposures to determine the cause and take steps to prevent recurrence.

(18) Terminate a program or procedure involving the use of radioactive material or radiation producing devices which are determined to be a medical threat to health and property.

(19) Keep all licenses and DARAs up to date and initiate amendments and requests for renewals when appropriate.

(20) Maintain a current registry of ionizing radiation producing devices, such as x-ray machines, per TB MED 521.

10.13.1 We will collect spent noble gas in a shielded trap and monitor the trap effluent with an air contamination monitor that we will check regularly according to the manufacturer's instructions.

10.13.2 We will collect spent aerosol in a shielded, single-use trap.

10.13.3 We will follow the model procedure for calculating airborne effluent concentration that was published in Appendix 0.2 to Regulatory Guide 10.8, Revision 2.

10.13.4 We will calculate spilled gas clearance times according to the procedure that was published in Appendix 0.4 to Regulatory Guide 10.8, Revision 2.

10.14 We will establish and implement the model radiation safety during radiopharmaceutical thera published in Appendix P to Regulatory Guide 10.8, Continue except for the provision at ATT 10.14.

10.15 We will establish and implement the model radiation safety during implant therapy that was Appendix Q to Regulatory Guide 10.8, Revision 2.

10.16 General Safety Proceedures See ATT 10.16

ITEM #11

11.2 See Item 11.1.

10.13.1 We will collect spent noble gas in a shielded trap and monitor the trap effluent with an air contamination monitor that we will check regularly according to the manufacturer's instructions.

10.13.2 We will collect spent aerosol in a shielded, single-use trap.

10.13.3 We will follow the model procedure for calculating airborne effluent concentration that was published in Appendix 0.2 to Regulatory Guide 10.8, Revision 2.

10.13.4 We will calculate spilled gas clearance times according to the procedure that was published in Appendix 0.4 to Regulatory Guide 10.8, Revision 2.

10.14 We will establish and implement the model procedure for radiation safety during radiopharmaceutical therapy that was published in Appendix P to Regulatory Guide 10.8, Revision 2, except for the provision at ATT 10.14.

10.15 We will establish and implement the model procedure for radiation safety during implant therapy that was published in Appendix Q to Regulatory Guide 10.8, Revision 2.

10.16 General Safety Proceedures See ATT 10.16

ITEM **#11**

11.1 We will establish and implement the general guidance and model procedures for waste disposal that were published in Appendix R to Regulatory Guide 10.8, Revision 2, except for the provision to hold for decay-in-storage material with a physical half-life of less than 90 days, as previously approved by the NRC (see ATT 11.1.1, ATT 11.1.2, and ATT 11.1.3). We also generate a large volume of RIA waste at the Drug Testing Lab at Ft. Meade (25 drums per month and increasing) which we would like to be able to hold for decay for only 5 half-lifes and dispose of, if all other conditions are meet. This waste is mostly empty, washed test tubes which are only minimally contaminated prior to the decay in storage process. This waste is generated at a location were RIA kits are the only radioactive material use and the waste is kept segregated from all other laboratory waste in separate sealed 55 gal. drums.

11.2 See Item 11.1.

Department of the Army

ii. The action levels are determined to be ALARA based upon consideration of worker, environmental, and public exposures.

Submit a description of the procedures to be followed to determine these criteria are met.

We will continue our review upon receipt of this information. Please reply in <u>duplicate</u> to my attention at the Region I office and refer to Mail Control No. 116472. The reviewer for this licensing action is Pamela Henderson. If you have any technical questions regarding this deficiency letter please call the reviewer at (215) 337-6952.

If we do not receive a reply from you within 30 calendar days from the date of this letter, we shall assume that you do not wish to pursue your application.

Sincerely,

roma K tomp

Jenny M. Johansen, Chief Medical Licensing Section Division of Radiation Safety and Safeguards

Enclosure: Regulatory Guide 8.23

ATTACHMENT 10.14

DEPARTMENT OF THE ARMY

WALTER REED ARMY MEDICAL CENTER WASHINGTON, DC 20307-5001



REPLY TO ATTENTION OF:

24 November 1992

Health Physics Office

United States Nuclear Regulatory Commission Attention: Chief, Medical Licensing Section Division of Radiation Safety and Safeguards 475 Allendale Road King of Prussia, Pennsylvania 19406-1415

Dear Ms. Jenny M. Johansen:

We provide the following information in reference to Mail Control No. 116472 and in response to your memo, dated 16 November 1992, requesting additional information concerning our dedicated iodine-131 therapy room.

As a matter of standing operating procedure, the dedicated therapy room, Room 7437, remains <u>closed</u> and <u>locked</u> when there are no iodine therapies. Only the Health Physics Office possesses a key to that room.

Decontamination limits for this room will be the restricted area action limits established in NRC Regulatory Guide 8.23, "Radiation Safety in Medical Institutions". Health Physics Office personnel will decontaminate the room below this level of removable contamination prior to admittance of an iodine-131 radiation therapy patient into Room 7437.

We hope that this information will satisfy your questions and permit you to grant our exemption to 10 CFR 35.315(a)(7). We appreciate your prompt attention to this matter.

Your point of contact for this matter is the undersigned at (301)-427-5104/5107.

Sincerely,

ARTHUR G. SAMTLJAN Lieutenant Colonel, US Army Health Physics Officer

ATT 10.16

Following are general rules for the safe use of radioactive materials:

1. Wear laboratory coats or other protective clothing at all times in areas where radioactive materials are used.

2. Wear disposable gloves at all times while handling radioactive materials.

3. Monitor hands and clothing for contamination after each procedure or before leaving area.

4. Do not eat, drink smoke, or apply cosmetics in any area where radioactive material is stored or used.

5. Wear assigned personnel monitoring device(s) at all times while in areas where radioactive materials are used or stored. Whole body monitoring device(s) should be worn at chest or waist level.

6. Dispose of radioactive waste only in specifically designated receptacles.

7. Never pipette by mouth.

8. Confine radioactive solutions in covered containers plainly identified and labeled with name of compound, radionuclide, date activity, and radiation level, if applicable

9. Always transport radioactive materials in appropriate shielding and containers.



DEPARTMENT OF THE ARMY WALTER REED ARMY MEDICAL CENTER WASHINGTON, D.C. 20307-5001

REPLY TO ATTENTION OF:

.1.9 .10到 1557

HSHL-H-HP (385-11m)

MEMORANDUM THRU

Commander, US Army Health Services Command, ATTN: HSCL-P, Fort Sam Houston, TX 78234-6000

HQDA (SGPS-PSP-E), 5109 Leesburg Pike, Falls Church, VA 22041-3258

FOR US Nuclear Regulatory Commission, Region I, Nuclear Material Safety Section A, 475 Allendale Road, King of Prussia, PA 19406

SUBJECT: Amendment of US Nuclear Regulatory Commission License No. 08-01738-02

1. Request that NRC License No. 08-01738-02 for Walter Reed Army Medical Center be amended to reflect a change in the Radiation Safety Officer from 1Lt. Allen W. Anthony to LTC Peter H. Myers. LTC Myers has been assigned as the Chief, Health Physics Office at Walter Reed AMC since August 1989. A Training and Experience Form and a Curriculum Vitae for LTC Myers are enclosed (Enclosures 1 and 2).

2. Request that Walter Reed's license also be amended to allow the holding for decay of radioactive waste containing isotopes with half lives up to ninety (90) days. We have been decaying waste with half lives of sixty five (65) days or less for a few years and have a good program for segregating, packaging, storing, and disposing of this material. We have the space to hold material for three (3) years instead of the current twenty two (22) months. Some protocols at Walter Reed use P-32 and S-35 in the same labs or even the same experiments, requiring that all the waste be packaged for burial because of the S-35 half life. Some animal studies use three (3) or four (4) different microspheres to measure blood flow at different time points in an experiment, Cr-51, Ru-103, and Ce-141 (all with half HSHL-H-HP SUBJECT: Amendment of US Nuclear Regulatory Commission License No. 08-01738-02

lives of less than sixty five (65) days) may be used with Sc-46 so all the waste has to be packaged for burial. This amendment would reduce our solid waste volume to the burial ground by 10-20%.

FOR THE COMMANDER:

2 Encls

ano nºs LTC, MS

Executive Officer

ATTACHMENT 11.1.1



DEPARTMENT OF THE ARMY WALTER REED ARMY MEDICAL CENTER WASHINGTON, D.C. 20307-5001



1. **1** 1.

HSHL-H-HP (385-11m)

15 March 1991

MEMORANDUM FOR US Nuclear Regulatory Commission, Region I, Nuclear Material Safety Section A, 475 Allendale Road, King of Prussia, PA 19406

SUBJECT: Amendment of US Nuclear Regulatory Commission License No. 08-01738-02. Additional information requested Docket No. 030-01317, Control No. 112925.

This is in reference to your request in a letter dated February 5, 1991 for additional information on our decay-in-storage program. The following information is provided in response to those questions.

1. The existing program for research waste with half-lives of 65 days or less generates 50-60 55gal. drums of compacted trash per year. The expected increase with half-lives of 90 days or less could raise the total to 60-75 drums per year. We currently hold this waste for 24 months to ensure at least 10 half-lives for the longest isotopes, which means we have between 100 and 120 drums in storage at any one time. Holding all our short halflife waste for 30 months could mean up to 185 drums in storage at any one time.

2. Enclosure 1 is a copy of one of the "Terms and Conditions" which all users of radioactive material at Walter Reed most follow. All the solid radioactive waste at Walter Reed is collected, screened, and packaged by the Health Physics Office. Bags of waste are examined by the health physics personnel when they are collected and again when they are compacted to ensure the proper segregation and defacing of any radioactive labels has occurred.

3. When the solid, short half-life, radioactive material is compacted it is in a 55 gal. steel drum (DOT 17H). The drum is sealed shut, the out side is marked with an I.D. number with an indelible marker, and the following information is recorded; the drum I.D., all isotopes in the drum and the initial activity of each, the date the drum was closed. When this drum is ready for disposal it is re-entered in a local disposal log and data base which includes; I.D. number, date closed, date disposed, survey instrument model, serial number and calibration date, background HSHL-H-HP (385-11m)

SUBJECT: Amendment of US Nuclear Regulatory Commission License No. 08-01738-02. Additional information requested Docket No. 030-01317, Control No. 112925.

readings, maximum readings of waste, and initials of person performing survey and waste disposal.

When the waste has been held for decay for at least 10 half-4 _ lives of the longest half-life material present, the drums are moved to a low background area and surveyed with a portable survey meter with a remote GM or scintillation probe. If no readings above background are found the drums are opened and the material is surveyed again as it is removed from the drum. Currently we are using a Ludlum model 2 with a GM probe which is calibrated in mr/hr. The normal background is approximately 0.05 mr/hr which is 10% of full scale on the lowest scale. If I-125 is the major remaining contaminate a low energy gamma scintillation probe may also be used to ensure no external radiation levels above background are present. The waste when originally packaged contains at most a few millicuries of activity, after at least 10 half-lives it contains at most a few microcuries of activity and no measurable external exposure. In addition this waste will continue to decay in a land fill at the rate of at least 4 half-lives per year making the likelihood of any internal deposition remote. Any biological waste held for decay will be incinerated at the conclusion of the decay period which will preclude the ingestion of this material.

5. The medical waste in question will be compacted into 55 gal. steel drums as outlined in question 3's response.

6. The waste storage facility at WRAMC is a

This building is constructed of concrete, concrete block and brick, it has no windows and very little flammable material involved in it's construction. This building is dry and heated and has a maximum capacity to hold two or three times the amount of waste we will be holding when this amendment is granted. This building is under the sole control of the Health Physics Office with

PETER H. MYPES LTC, MS Health Phypics Officer

12

1 Encl

HEALTH PHYSICS WALTER REED ARMY MEDICAL CENTER Washington, D.C. 20307-5001

CONDITION NO. 4

For

RADIOACTIVE MATERIAL AUTHORIZATIONS

RADIOACTIVE - WASTE

1. <u>General</u>. Radioactive waste from Walter Reed Army Medical Center and tenant activities will be controlled, packaged, transported, and disposed of in accordance with AR 385-11, "Ionizing Radiation Protection;" Title 10, Code of Federal Regulations; Title 49, Code of Federal Regulations; Nuclear Regulatory Commission Licenses issued to WRAMC; applicable provisions of State Government requirements for waste disposal sites located within their jurisdiction; and the guidelines delineated herein.

2. Definitions:

a. <u>Radioactive Material</u>: Any material or combination of materials that spontaneously emits gamma rays, X-rays, alpha particles, beta particles, neutrons, or other atomic particles that are capable of producing ions, directly or indirectly by their passage through matter.

b. <u>Radioactive Waste</u>: Surplus items containing radioactive material, property contaminated with radioactive material to the extent that decontamination is economically unsound, and materials that have become contaminated during possession/use of radioactive material.

c. <u>Activity</u>: The number of nuclear transitions (disintegrations) occurring in a given quantity of material per unit time (disintegrations per second); expressed in units of Curies or Becquerels.

d. <u>Specific Activity</u>: Total activity of a given radionuclide per gram of a compound, element, or radioactive nuclide.

e. <u>Curie</u>: The special unit of activity. One curie equals 3.700 X 10¹⁰ nuclear transitions per second. (Abbreviated Ci.). Several fractions of the curie are in common usage:

(1) <u>Microcurie</u>: One-millionth of a curie $(3.7 \times 10^4 \text{ disintegrations})$ per sec.). Abbreviated μ Ci.

(2) <u>Millicurie</u>: One-thousandth of a curie (3.7 X 10⁷ disintegrations per sec.). Abbreviated mCi.

REVISION 2, effective 13 Apr 87

ATTACHMENT 11.1.2

Enel 1

CONDITION NO. 4 FOR RADIOACTIVE MATERIAL AUTHORIZATIONS (RADIOACTIVE WASTE)

- (12) Animal Carcasses/Animal Waste: Short half-life.
- (13) Animal Carcasses/Animal Waste: Long half-life.
- (14) <u>Animal Carcasses</u>: \leq 0.05 Microcuries H-3 or C-14 per gram of animal tissue averaged over the entire weight of the animal.
- (15) Gas, Combustible.
- (16) Gas, Non-combustible.

b. Limiting the non-radioactive waste which is intermixed with radioactive waste to an absolute minimum.

c. Removing or obliterating all "Radioactive Material" labels on nonradioactive vendor shipping packages and on short half-life radioactive waste. Uncontaminated vendor shipping containers may be disposed of in the normal trash by the users. Short half-life waste will be delivered to Health Physics Office (HPO) collection points for subsequent storage, decay, and ultimate disposal in the normal trash when HPO personnel have determined that the waste has reached natural background radiation levels.

d. Storing used Mo-99/Tc-99m generators and other items of equipment containing radioactive material in designated areas only. The radiation labels will be removed on such items only when they reach background radiation levels.

e. Maintaining their inventory of radioactive waste to a practical minimum.

f. Controlling radioactive waste in their work areas to prevent unauthorized disposal by the custodial service. Magenta plastic bags will be used to contain radioactive waste. Magenta bags will not be used for other purposes.

g. Insuring that all radioactive waste is delivered to HPO collection point personnel for ultimate disposal.

h. Marking all radioactive waste containers with the radiation caution symbol and the words "Caution - Radioactive Waste" and/or "Caution -Radioactive Material." Plus "DO NOT EMPTY!"

i. Insuring that radioactive material is not released into the sanitary sewage system without the specific approval of the Health Physics Officer.

j. Insuring that decontamination of reusable equipment is only performed in laboratory sinks that have been authorized via their Radioactive Material Authorization. See <u>Section II</u> for specific requirements concerning this procedure.

ATTACHMENT 11.1.2

CONDITION NO. 4 FOR RADIOACTIVE MATERIAL AUTHORIZATIONS (RADIOACTIVE WASTE)

i. Biological wastes (e.g., animal carcasses/animal waste) shall be prepared by the User in a manner that allows the waste to be readily packed in in a 30gallon drum alternating 10-inch layers of waste and packing materials. Prepared biological waste shall be placed in double magenta plastic bags and tagged as previously indicated.

SECTION II - RELEASE OF RADIOACTIVITY INTO THE SANITARY SEWAGE SYSTEM

1. Liquid waste will be released to the sanitary sewage system in accordance with Title 10, Code of Federal Regulations, Chapter 1, Part 20.303 (i.e., 10 CFR 20).

2. Unless specifically authorized by the Health Physics Office, all releases of radioactive liquid to the sanitary sewerage system will be conducted by the Health Physics Office to assure that the quantity of radioactive material released into the system by combined WRAMC disposal procedures does not exceed the following limits:

a. The quantity of any licensed or other radioactive material released into the system by WRAMC in any one day does not exceed the larger of paragraphs a(1) or (2) below.

(1) The quantity which, if diluted by the average daily quantity of sewage released into the sewer by WRAMC will result in an average concentration equal to the limits specified in Appendix B, Table I, Column 2 of 10 CFR 20 or

(2) Ten times the quantity of such material specified in Appendix C of 10 CFR 20-and

b. The quantity of any licensed or other radioactive material released in any one month, if diluted by the average monthly quantity of water released by WRAMC, will not result in an average concentration exceeding the limits specified in Appendix B, Table I, Column 2 of 10 CFR 20 and

c. The gross quantity of licensed and other radioactive material, excluding hydrogen-3 and carbon-14, released into the sewerage system by WRAMC does not exceed one curie per year. The quantities of hydrogen-3 and carbon-14 released into the sanitary sewerage system may not exceed 5 curies per year for hydrogen-3 and 1 curie per year for carbon-14. Excreta from individuals undergoing medical diagnosis or therapy with radioactive material shall be exempt from any limitations contained in this document.

3. The following policy and procedures apply to all individuals permitted to release radioactive washings into the sanitary sewage system via laboratory sinks:

a. Such release approval must be specifically included in the Principal User's WRAMC Radioactive Material Authorization.

5

CONDITION NO. 4 FOR RADIOACTIVE MATERIAL AUTHORIZATION (RADIOACTIVE WASTE)

SECTION IV - RADIOACTIVE WASTE DISPOSAL SUPPLIES

1. Items of supply for the containment and packaging of radioactive waste are stocked by the Supply and Administration Branch, Materiel Division, Directorate of Industrial Operations, WRAMC. The stockage items meet U.S. Army and Federal radioactive material packaging requirements for most of the radioactive waste resulting from laboratory and/or clinic procedures at WRAMC, WRAIR and AFIP. However, it should be noted that packaging requirements vary with the particular type, form and curie amount of the radioactive waste. Consequently, all personnel involved with the packaging of radioactive waste should consult the Health Physics Office in order to assure that the available stockage items meet packaging specification requirements for each particular radioactive waste disposal operation.

2. Following are the currently stocked items:

a. DRUM, Steel, DOT Specification 17-H, 30-gallon with gasket and sealing bolt. (Used as shipping container for the transport of radioactive biologicals).

b. DRUM, Steel, DOT Specification 17-H, 55-gallon with gasket and sealing bolt. (Used as a shipping container for the transport of low-level radioactive materials).

c. VERMICULITE, 4 cu ft bags. (Used as an absorbent material for the packaging of biological and liquid radioactive waste) - agricultural, Grade 4.

d. SLAKED LIME (Used to retard spoilage of biological radioactive waste).

e. BAG, Plastic, Magenta, 20" x 15" x 60", 4 mil thickness. (Used as a liner for large waste receptacle).

f. BAG, Plastic, Magenta, $13" \times 12" \times 24"$, 2 mil thickness. (Used as a liner for small laboratory radioactive waste receptacle).

g. DIATOMACEOUS EARTH, medium grade (floor dry #85), 2.5 cu ft bag. (Used as an absorbent material for packaging of liquid radioactive waste).

3. Additional items will be stocked or procured as required to meet the provisions of Federal/State regulatory agencies.

4. Principal Users are responsible for funding the costs of materials and supplies used to dispose of radioactive wastes. Although Principal Users will pay for the supplies they stock for use in their particular areas, the Health Physics Office, RMC Branch, will order and pick up the supplies needed to collect and package the radioactive waste received from the Principal Users. All orders placed by the Health Physics Office for radioactive waste disposal supplies for the hospital, WRAIR and AFIP will be funded by Clinical Investigation, Department of Pathology/Laboratory Services, Department of Radiology, WRAIR, or AFIP as appropriate.

ATTACHMENT 11.1.2

KC, FORM 374	LATORY COMMISSION PAGE OF PAGES
CORRECTED COPY MATERIAI	LS LICENSE Amendment No. 66
Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Act of Federal Regulations, Chapter I, Parts 30, 31, 32, 33, 34, 35, 39, ande by the licensee, a license is hereby issued authorizing the licensee auclear material designated below; to use such material for the purpose(so persons authorized to receive it in accordance with the regulations of the perified in Section 183 of the Atomic Energy Act of 1954, as amended, Regulatory Commission now or hereafter in effect and to any condition	ergy Reorganization Act of 1974 (Public Law 93-438), and Title 10, 9, 40 and 70, and in reliance on statements and representations heretofore to receive, acquire, possess, and transfer byproduct, source, and special and at the place(s) designated below; to deliver or transfer such material and at the place(s). This license shall be deemed to contain the conditions and is subject to all applicable rules, regulations and orders of the Nuclear as specified below.
Licensee	In accordance with the application detect
Department of the Army Walter Reed Army Medical Center (WRAMC)	January 21, 1993, 3. License number 08-01738-02 is amended in its entirety to read as follows:
Washington, D.C. 20307-5001	4. Expiration date June 30, 1999
	5. Docket or Reference No. 030-01317
Byproduct, source, and/or 7. Chemical and special nuclear material form	d/or physical
 Any Dyproduct mater fair with A. Any atomic numbers 1-83.4 B. Iodine 131 B. Any C. Xenon 133 D. Krypton 85 E. Phosphorus 32 F. Carbon 14 G. Iodine 125 H. Iridium 192 I. Chromium 51 J. Sulfur 35 K. Hydrogen 3 L. Molybdenum 99 M. Technetium 99m M. Any N. Strontium 90 	A. 400 millicuries of each radionuclide with a total possession limit of 26 curies B. 2 curies C. 2 curies D. 1 curie E. 2 curies F. 2 curies G. 1 curie H- I. 750 millicuries J. 1 curie K. 5 curies L. 23 curies M. 23 curies
D. Cesium 137 D. Gadolinium 153 D. Iodine 125 D. Sealed so D. Sealed so	ources 0. ources P. ources 0. 500 millicurios
(3M Compared of a compared of	any seeds) purces R. 4 sources, not to exceed d Inst. Co., 300 millicuries each BA591A or AECL
Models CA Amersham Amersham IMC.P2) accordance with the Freedom of information	235 or C324, or Corp. Model
No. 2006-0258	2 [10]

DECHOROCO			
NRC Form 374A (5-84)	U.S. NUCLEA	R REGULATORY COMMISSION	PAGE 2 OF 5 PAGES
•	MATERIALS LICE	NSE	08-01738-02 Docket or Reference number
	SUPPLEMENTARY SH	221	030-01317
<u> </u>	ORRECTED COPY	·····	Amendment No. 66
(Items 6.,	7. & 8. continued)		
6. Byprodu special	ct, source, and/or nuclear material	7. Chemical and/or form	physical 8. Maximum amount that licensee may possess at any one time under this
			license
S. Cesium T. Cobalt U. Americi V. Americi	137 60 um 241 um 241	S. Sealed sources T. Sealed sources U. Any V. Sealed sources	S. T. U. 100 microcyries V.
		-1	IULA.
W. Nickel X. Iodine Y. Thorium Z. Uranium AA. Cesium	63 129 137	W. Sealed sources X. Sealed sources Y. Any Z. Any As Sealed sources	and foils W. 1 curie A 1 curie 5 kilograms Z. 50 kilograms AA
BB. Americ CC. Cesiun	cium 241 / / / / / / / / / / / / / / / / / / /	BESSeal ed sources Conseal ed /source	BB. CC.
DD Uranii			ADD Kilograms
Uraniu			
9. Autho	orized use		
A. through	n CC. Medical diagnosi	s, therapy and resea	arch in humans in accordance with any
	applicable Food development as d calibration: stu	and Drug Administrat efined in 10 CFR 30. dent distriction	4, including animal studies; instrumen
DD. Shiel	lding in linear accele	rators.	
		CONDITIONS	
10. Locat WRAM(Inst Medic and L Rickr Resea	tion of use: Walter R C Forest Glen Section itute of Research Anim cal Laboratory, WRAMC J.S. Army Institute of man Building, 13 Taft arch Center, 1413 Rese	eed Army Medical Cer and Annex, Silver Sp al Holding Facility, Department of Pathol Dental Research Fac Court, Rockville, Ma arch Boulevard, Rock	nter, Washington, D. C.; pring, Maryland; Walter Reed Army , Fort Meade, Maryland; U.S. Army logy, Fort Meade, Maryland; cility, Fort Meade, Maryland; aryland and Gillette Building, 270 kville, Maryland.
11. A.	Licensed material sha designated in writing Chairperson.	11 be used by, or un by the Radiation Sa	nder the supervision of, individuals afety Committee, Col. Joan T. Zajtchuk
Β.	The use of licensed m or podiatrist as defi	aterial in or on hur ned in 10 CFR 35.2.	nans shall be by a physician, dentist,
		CXL	
HATTANANANANA	Xex #V#V#V#V#V#V#V#V#V#V#V#V		

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NRC Form 374A	U.S. NUCLEAR	REGULATORY COMMISSION		PAGE	3	OF	5	PAGES
(5-84)			License number	L				
τ. i	MATERIALS LICENSE SUPPLEMENTARY SHEET		08-01738-02					
			Docket or Reference	e number				
•			030-01317					
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- C. Physicians, dentists, or podiatrists designated to use licensed material in or on humans shall meet the training criteria established in 10 CFR 35, Subpart J and shall be designated in writing by the licensee's Radiation Safety Committee.
- D. The Radiation Safety Officer for this license is LTC William B. Johnson.
- 12. In addition to the possession limits in Item 8, the licensee shall further restrict the possession of licensed material at a single location to quantities below the limits specified in 10 CFR 30.72 which require consideration of the need for an emergency plan for responding to a release of licensed material.
- 13. Notwithstanding the requirements of 10 CFR 35.49(a) and (b), 35.100, 35.200, 35.300, 35.400 and 35.500 the licensee may use for any medical use any byproduct material or reagent kit. The licensee shall possess and use byproduct material for medical use in accordance with the prescriptive and performance criteria in the other sections of 10 CFR 35. This does not relieve the licensee from complying with applicable U.S. Food and Drug Administration (FDA) and other Federal and State requirements.
- 14. A. Detector cells containing a titanium tritide this or a scandium tritide foil shall only be used in conjunction with a professory operating temperature control mechanism which prevents the foil temperatures from exceeding that specified in the certificate of registration referred to 1.10 CFR 32.210.
 - B. When in use, detector cells containing actuality tritide foil or a scandium tritide foil shall be sented to the pursue.
- 15. The licensee shall conduct a prevaical inventory every three months to account for all sealed sources and devices containing freensed material received and possessed pursuant to 10 CFR 35(59, 35.400 and 35.500 and every six months for all other sealed sources and devices.
- 16. A. Sealed sources and detector cells containing licensed material shall be tested for leakage and/or contamination at intervals not to exceed six months or at such other intervals as are specified by the certificate of registration referred to in 10 CFR 32.210, not to exceed three years.
 - B. Notwithstanding Paragraph A of this Condition, sealed sources designed to emit alpha particles shall be tested for leakage and/or contamination at intervals not to exceed three months.
 - C. In the absence of a certificate from a transferor indicating that a leak test has been made within six months prior to the transfer, a sealed source or detector cell received from another person shall not be put into use until tested.

- D. Each sealed source fabricated by the licensee shall be inspected and tested for construction defects, leakage, and contamination prior to any use or transfer as a sealed source.
- E. Sealed sources and detector cells need not be leak tested if:

(i) they contain only hydrogen-3; or

(ii)	MATERIALS LICENSE SUPPLEMENTARY SHEET	Docket or Reference number
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) they contain only a radioactive gas	; or
1) the helf life of the instance is 20	dava an lacar an
(111)) the half-life of the isotope is 30 (days or less; or
(iv)) they contain not more than 100 micr material or not more than 10 microc	ocuries of beta and/or gamma emitting uries of alpha emitting material; or
(v)) they are not designed to emit alpha being used. However, when they are transfer to another person, and hav leak test interval, they shall be source or detecton cell shall be st without being tested for leakage an	particles, are in storage, and are not removed from storage for use or e not been tested within the required ested before use or transfer. No sealed ored for a period of more than 10 years d/or contamination.
F. The rad O.(with sha dia fi U.S Sa rep Con G. The lie St	e test shall be capable of detecting t dioactive material on the test sample. 005 microcurre or more of removable co th the U.S. Noclear Regulatory Commiss all be removed immediately from servic sposed of in accordance with Commissio led within five days of the date the 1 S. Nuclear Regulatory Commission: Regi fety Branch, 475 Allendare Road, King port shall Specify the source bi detec rrective action taken e licensee is author reputs confect te censee. Alternatively, tests for teak rformed by persons specifically licens ate to perform such services.	he presence of 0.005 microcurie of If the test reveals the presence of ntamination? a report shall be filed ion and the source or detector cell e and decontaminated, repaired, or n reputations. The report shall be eak test result is known with the or DEATN: Chief, Nuclear Materials of prussia? Penns Vania 19406. The tor cell involved the test results, and test samples for analysis by the age ind/or contamination may be add by the Commission or an Agreement
	sources or detector cells containing 1	icensed material shall not be opened or censee.
7. Sealed sources	removed from source norders of the	
7. Sealed sources 3. The lic less th storage	ensee is authorized to hold radioactiv an 65 days and Sulfur 35, Cobalt 58, I before disposal in ordinary trash, pr	ve material with a physical half-life of ridium 192, Scandium 46, for decay-in- vovided:
7. Sealed sources 3. The lic less th storage A. Wa ha	ensee is authorized to hold radioactiv an 65 days and Sulfur 35, Cobalt 58, I before disposal in ordinary trash, pr ste to be disposed of in this manner s lf-lives.	ve material with a physical half-life of ridium 192, Scandium 46, for decay-in- ovided: hall be held for decay a minimum of ten

C. A record of each such disposal permitted under this License Condition shall be retained for three years. The record must include the date of disposal, the date on which the byproduct material was placed in storage, the radionuclides disposed, the survey instrument used, the background dose rate, the dose rate measured at the surface of each waste container, and the name of the individual who performed the disposal.

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ØRC Fo 5-84)	INC FORM 3/44 0.5. NOCLEAN REGULATORY CU		Y COMMISSION	License number	PAGE	5	OF	5	PAGES
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		SUPPLEMENTARY SHEET			030-0)1317			1 .
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19.	Experimenta administere	al animals, or the product ed licensed materials shal	s from expe l not be us	erimental an ed for human	imals, t n consun	hat ptio	have n.	been	•
20.	The license accordance 10 CFR Part	ee shall possess and use b with the prescriptive and 35 except sections 35.49	yproduct ma performanc (a) and (b)	terial for l e criteria , 35.100, 3	numan re in all s 5.200, a	esear Secti and 3	ch i ons (5.30(n of O.	
21.	The license provisions	ee is authorized to transp of 10 CFR Part 71, "Packa	ort license ging and Tr	d material ansportation	in accor n of Rac	danc lioac	e wi tive	th th Mate	e rial."
22.	The license the source pursuant to	ee shall not acquireflicen or device has been regist 0 10 CFR 32.210 or equival	REG sed materia ered with t ent regulat	he U-SC/Nuc ions of an /	ed sourc lear Reg Igreemer	ce or ulat it St	dev ory (ate.	ice u Commi	nless ssion
23.	Radioactive representat licensee's	e waste generated shall be tions, and procedures incl letter/application dated	stored in uded with t September 9	accordance the waste study, 1993 and (rith the brage pl October	e sta an d 29,	teme escr 1993	nts, ibed •	in the
24.	Notwithstan contaminat accordance April 8, 19	nding the requirements of ion in rooms used to house with the commitments and 992 and November 24, 1992	10-GER 35.6 radiopharn procedures	15(1)(7), the second se	ne ficer nerap p n the le	nsee Datie Datier	may nts s da	contr in ted	01
25.	Except as its program contained changes in The U.S. No statements corresponde	specifically provided other in in accordance with these in the documents, Shouldin the medical use radiation uclear Regulatory Commissi representations, and pro ence are more resprictive	rivise in the re	representat sures, listo cedures as trons shall the license gulations.	the lic ions, ar ed below provided govern e's appl	cense nd pr , ex i in unle licat	e sh oced cept 10 C ss t ion	all c ures for FR 35 he and	minor .31.
	A. Applie B. Letter C. Letter D. Letter E. Letter F. Letter	cation dated January 27, 1 r dated September 9, 1993 r dated October 29, 1993 r dated December 9, 1993 r dated February 15, 1994 r dated June 2, 1994	⁹⁹³ * *						
	1 1 1		· · · ·						
Date	OCT	1 3 1994	For the	U.S. Nucle Original S Francis N	ar Regu Signed B I. Coste	lator Y: Ilo	y Co	mmiss	ion

Region I King of Prussia, Pennsylvania 19406

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president to the Atomic Linergy Au inde of Federal Regulations, Chapter ande by the licensire, a license is her present material designated twitter, in a persons outborsted to receive it in a persided in Section 183 of the Atomia regulatory Commission new or here	ct of 1954, as amended, the E r J. Parts 30, 31, 32, 33, 34, 35, reby assued authorizing the licen- use such material for the paymon accordance with the regulations of c herry. Act of 1954, as amendes rather in effect and to any conditi-	nergy Reinganization Act of 39, 40 and 70, and in reliance ce to receive, acquire, process is) and at the placets) designat the applicable Pari(s). This lice 3, and is subject to all applicable ions specified below	1.1974 (Public Law 93-418), and Title on statements and representations herei , and transfer by product, source, and sp ed below, to deliver or transfer such ma ense shall be deemed to contain the cond e rules, regulations and orders of the Nu	e 10, nforv pecial iterial itions iclear
Lean Department of the Arr Walter Reed Army Hed	we my ical Center (WRAHC)	In accordance January 21, 1 3 License number O Its entirety	with the application dat 993. 8-01738-02 is amended in to read as follows:	ed
Washington, D.C. 20	307-5001	4 Expiration date	June 30, 1999	
		S. Docket or Reference No	30-01317	
Byproduct, source, and/os special musical material	7. Chemical i	ind/or physical	Maximum amount that license may possess at any one time under this license	39
Atomic numbers 1-83 Atomic numbers 1-83 C. Xenon 133 D. Krypton 85 C. Phosphorus 32 F. Carbon 14 G. Iodine 125 H. Iridium 192 I. Chromium 51 J. Sulfur 35 K. Hydrogen 3 L. Molybdenum 99 H. Technetium 998 N. Strontium 90	E. Any C. Any C. Any E. Any F.	num 99/ Lum 99n Lum 99n Lorg	A. 400 millicuries of e radionuclide with a possession limit of curies B. 2 curies C. 2 curies C. 2 curies F. 2 curies G. 1 curie II. J. 750 millicuries C. 1 curie K. 5 curies L. 23 curies	iach total 26
O. Cestum 137 P. Gadolinium 153 Q. Iodine 175	O. Sealed P. Sealed Q. Sealed	sources sources sources	0. p 0. 500 millicuries	
R. Iodine 125	(]M Co R. Sealed ((Norl) Nodel Nodels Amersh (MC.P2)	mpany seeds) sources and Inst. Co., 178A591A or ALCL C235 or C324, or am Corp. Model)	R. 4 sources, not to ex 300 millicuries each	ceed
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HAC / sim 374A PAGES_ 11. 6A1 Lizzam aumbe ा संस्थ 08-01738-02 MATERIALS LICENSE Doctat of Reference number SUPPLEMENTARY SHEET 030-01317 CORRECTED COPY Amendment No. 66 (Items 6., 7. & B. continued) 6. Byproduct, source, and/or 7. Chemical and/or physical B. Maximum amount that special nuclear material form licensee may possess at a a la anti-triga e activit any one time under this 1 1 2 license S. Cesium 137 S. Sealed sources S. T. Cobalt 60 Communication of the sources S. U. Americium 241 U. Any U. 100 microcuriés V. Seal GR INFA V. Americium 241 ļ W. Sealed sources and foils AW. 1 curie V. Nickel 63 Ca l curie 5 kilograms 2 50 kilograms X. Iodine 129 X. Sealed sources Y. Thorium Y. Any see ES. Z. Uranium Z. Any -Sealed sources AA. Cesium 137 AA: 88, Americium 241 lealed Tourses 88, billed Source CC, Cestum 137 22 hericanthuc] repration P ; DD. TOO Kilograms DD. Uranium depleted 10/ Uranium 235 J. Authorized use A. through CC. Medical diagnetis, therapy and research in humans in accordance with any applicable food and Drug Administration (FDA) requirements. Research and development as defined, in 10 CFR 30.4, including animal studies; instrument Calibration; student Antenction. * * CONTINUS 10. Location of use: Walter Reed Army Medical Center, Washington, D. C.; and WRAMC Forest Glen Section and Annex, Silver Spring, Maryland; Walter Reed Army Institute of Research Animal Holding Facility, Fort Meade, Maryland; U.S. Army Medical Laboratory, WRAME Department of Pathology, Fort Meade, Maryland; 8 and U.S. Army Institute of Dental Research Facility, Fort Meade, Maryland; Rickman Building, 13 Taft Court, Rockville, Maryland and Gillette Building, 270 櫾 ļ Research Center, 1413 Research Boulevard, Rockville, Maryland. Licensed material shall be used by, or under the supervision of, individuals designated in writing by the Radiation Safety Committee, Col. Joan T. Zajtchuk 王朝御皇后王朝御御御御御御 11. A. Chairperson, The use of licensed material in or on humans shall be by a physician, dontist. or pollatrist as defined in 10 CFR 35.2.

NRC 1. mm 374A	U.L. N CAR REGULATORY COMMISSION	PAGE 3 OF 5 PAG
		Licente number 08-01738-02
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C C	ORRECIED COPY	Amendment No. 66
C.	Physicians, dentists, or podiatrists design on humans shall meet the training criteria and shall be designated in writing by the	gnated to use licensed material in or a established in 10 CFR 35, Subpart J licensee's Radiation Safety Committe
D.	The Radiation Safety Officer for this lice	ense is LTC William B. Johnson.
12. In ad	dition to the possession limits in Item 8	the licensee shall further restrict
the particular	ossession of licensed material at a single s specified in 10 CPR 30.72 which require	e location to quantities below the consideration of the need for an
energ	ency plan for responding to a release of	licensed material.
13. Notwi	that and ing the requirements of 10 CFA 35.	79(A) and (b), 35.100, 35.200, 35.300
35.40 reade	w and 35.500 the licensee may use for any mit kit. The licensee shall bossess and use	medical juse any byproduct material o se byproduct material for medical use
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14. A.	Detector celly containing a titanium trit	Ide will or a scandium tritide foil
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	Notwithstanding Paragraph A of this Condi	tion, sealed sources designed to emit
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D.	Each sealed source fabricated by the lice construction defects, leakage, and contam	nsee shall be inspected and tested fo ination prior to any use or transfer
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	Sealed sources and detector cells need no	t be leak tested if:
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(11) they contain only a radioactive gas; or (11) they contain only a radioactive gas; or (11) the half-life of the isotope is 30 days (11) they contain not more than 100 microcuri material or not more than 10 microcuries (v) they are not designed to emit alpha part being used. However, when they are remo transfer to another person, and have not	or less; or es of beta and/or gamma emitting of alpha emitting material; or
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(v) they are not designed to emit alpha part being used. However, when they are remo transfer to another person, and have not	
source or detector cell shall be stored without being tested for leakage and/or	icles, are in storage, and are no ved from storage for use or been tested within the required before use or transfer. No seal for a period of more than 10 year concomination.
F. The test shall be espable of detecting the pr radioactive material on the test sample. If 0.005 microcurte or more of removable contamin with the U.S. SigcleartRepBlatory Commission a shall be removed immediately from service and disposed of immediately from service and filed within five days of the date the leak	esence () 0.005 microcurie of the test aveals the presence of nation, a report shall be filed the source or detector cell decontaminated, repaired, or distions. The report shall be est result () known with the
G. The licensee is authorized to the test of the licensee is authorized by periors specifically directly by the second to the licensee is authorized by periors specifically directly by the second by periors specifically directly by the second by periors specifically directly by the second by periors specifically directly directly by state to perform such services.	st sampler for analysis by the bd/or commination may be the Commination or an Agreement
17. Sealed sources or detector tells containing licens sources removed from source holders by the Licens	ed material shall not be opened o
18. The licensee is authorized to hold radioactive mat less than 65 days and Sulfur 35, Cobalt 58, Iridiu storage before disposal in ordinary trash, provide	erial with a physical half-lifo o m 192, Scandium 46, for decay-in- d:
A. Waste to be disposed of in this manner shall half-lives.	be held for decay a minimum of te
B. Before disposal as ordinary trash, the waste surface with the appropriate survey instrumen and with no interposed shielding to determine distinguished from background. All radiation obliterated.	shall be surveyed at the container t set on its most sensitive scale that its radioactivity cannot be labels shall be removed or
C. A record of each such disposal permitted under retained for three years. The record must in date on which the byproduct material was plac disposed, the survey instrument used, the bac	r this License Condition shall be clude the date of disposal, the ed in storage, the radionuclides kground dose rate, the dose rate her, and the name of the individua
who performed the disposal.	

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• Experimental an administered li	imals, or the products fro censed materials shall not	m experimental animals, that have been be used for human consumption.	
. The licensee sh accordance with 10 CFR Part 35	all possess and use byprod the prescriptive and perf except sections 35.49(a) a	uct material for human research in formance criteria in all soctions of and (b), 35.100, 35.200, and 35.300.	
. The licensee is provisions of 1	authorized to transport 1 0-CFR®Part#71, *Packaging	icensed material in accordance with the and Transportation of Radioactive Material?	S y S
• The licensee sh the source or d pursuant to 10	all not acquire ficensed a evice has been registered CFR 32.210 or equivalent r	Referral in/a sealed source or device unless with the U-Sc/Nuclear Regulatory Commission regulations of an Agreement State.	
. Radioactive was representations licensee's lett	te generated shall be stor , and procedures included er/application dated Septe	red in accordance with the statements, with the waste storage plan described in th mmber 9, 1993 and October 29, 1993.	10
. Notwithstanding contamination i	the requirements of 10 Ge n comis used to shouse radi	R 35 (15(1)(7), the licensee may control opharmaceutical ther () patients in	
April 8, 1992 a	the commitment stand proce no November 24 - 1928-	dures contained in the letters dated	1
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OCT 1 3 1994

License No. 08-01738-02 Docket No. 030-01317 Control No. 117725

Headquarters U.S. Army Medical Command ATTN: Colonel Peter Myers MCHO-CL-W 2050 Worth Road Fort Sam Houston, Texas 78234-6000

Dear Colonel Myers:

Enclosed is the Corrected Copy of Amendment No. 66 for License No. 08-01738-02. As discussed during your recent inspection, the condition granting an exemption to the decontamination requirements of 10 CFR 35.315(a)(7) has been added to the amendment and the date of the renewal application has been corrected.

We apologize for any inconvenience this error may have caused.

Sincerely,

Original Signed By: Francis M. Costelio

Francis M. Costello, Chief Medical Licensing Section Nuclear Materials Safety Branch Division of Radiation Safety and Safeguards

Enclosure: Corrected Copy of Amendment No. 66

bcc: Department of the Army Walter Reed Army Medical Center ATTN: Lt. Col. William B. Johnson Radiation Safety Officer 2681 Linden Lane Silver Springs, Maryland 20910

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NOV 2 1 1994

ARMY, DEPARTMENT OF THE WALTER REED ARMY MEDICAL CENTER WASHINGTON, DC 20307-5001

ATTN: WILLIAM B. JOHNSON

RE: Docket Number: 030-01317 License Number: 08-01738-02

Dear Col. Johnson:

This letter acknowledges receipt of your letter dated November 1, 1994, in response to our letter which addressed deficiencies in your Quality Management Program (QMP). Your implementation of the QMP and its adequacy will be reviewed as part of the next NRC inspection. This inspection will include a review of your letter referenced above and any resulting changes to your QMP.

This QMP will not be incorporated into your license by condition. You have the flexibility to make changes to your quality management program without obtaining prior NRC approval. However, modifications to your program must be submitted to this Office within 30 days as required by 10 CFR 35.32(e).

Thank you for your cooperation in this matter; no reply is required in response to this letter.

Sincerely,

ORIGINAL SIGNED BY: JENNY M. JOHANSEN Jenny M. Johansen Quality Management Program Coordinator Region I

information in this record was deleted
in accordance with the Freedom of Information
Act. exemptions
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DEPARTMENT OF THE ARMY WALTER REED ARMY MEDICAL CENTER WASHINGTON, DC 20307-5001



REPLY TO ATTENTION OF:

1 November 1994

Health Physics Office

SUBJECT: Quality Management Program (QMP), Reference Docket Number 030-01317, License Number 08-01738-02, QMP File Date of 27 January 1992, Region I

Nuclear Materials Safety Branch Division of Radiation Safety and Safeguards ATTENTION: QMP Coordinator/Mr. James P. Dwyer U.S. Nuclear Regulatory Commission, Region I 475 Allendale Road King of Prussia, Pennsylvania 19406-1415

Dear Mr. Dwyer:

Your letter of 28 September 1994, subject as above, was received by the Health Physics Office, Walter Reed Army Medical Center, Washington, D.C, on 27 October 1994. The referenced letter requested that we immediately update the Quality Management Program (QMP), which was dated 27 January 1992, and submit the new QMP to the NRC, Region I.

Since the QMP dated 27 January 1992, the following revisions and actions of the QMP have taken place:

a. A memorandum, dated 2 June 1994, subject: Additional Information for Review of Renewal of USNRC License No. 08-01738-02, mail control number 117725, was submitted to USNRC Office, Region I. Enclosure 2 of this memorandum provided the QMP for the Nuclear Medicine Service, Walter Reed Army Medical Center (WRAMC), dated 22 March 1994. Also the QMP for brachytherapy from the Radiation Oncology Service, WRAMC, was provided.

b. A new Brachytherapy QMP was approved and became effective on 1 September 1994. The revised brachytherapy QMP was forwarded to USNRC, Region I, by memorandum dated 15 September 1994, subject: QMP Revision.

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Since the QMP has been completely revised from the document that was reviewed, request that the NRC review the current QMP for WRAMC to meet the objectives of 10 CFR 35.32. A copy of our current QMP is enclosed. The point of contact for questions regarding this submittal is the undersigned at 301 427-5104.

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Enclosure As Stated

William B. Johnson

Colonel, U.S. Army Chief, Health Physics Office & Radiation Protection Officer

1 September 1994

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BRACHYTHERAPY QUALITY MANAGEMENT PROGRAM SOP

Quality Management Program Ι.

The five objectives which this program aims to achieve with high confidence are:

- 1. Written directive given prior to administration.
- Patient I.D. verified by more than one method. 2.
- Final plan of treatment and dosinetry calculations 3.
- are in accordance with the written directive.
- Source loading, prior to implantation, in accordance with written directive. 4.
- Any unintended deviation from the written directive 5. is identified, evaluated, and appropriate action taken.

Periodic review of the QMP includes:

- All misadministrations. 1.
- All recordable events. 2.
- 3. All brachytherapy procedures.
- Proquency of review at least annually. 4.
- 5. Retain records for three years.

II. ONP for Brachytherapy

- Written Directive -- A written directive must be signed λ. and dated by the authorized user prior to administration of the brachytherapy dose. This must include:
 - Name of patient. 1.
 - 2. Radionuclide.
 - 3. Treatment site.
 - 4. Applicator.
 - 5. Cumulative dose and anatomical dose point.
- В. Oral Directives -- Oral directives will generally not be issued. However, if an oral directive is given to modify a written directive, then the recommendations for documentation as specified in NRC Guide 8.33 will be followed.
- C. Dosinstry Plan -- A (Computer) dosinstry plan must be accepted by the authorized user prior to implantation. This plan must include:
 - 1. Radiographic localization of sources (either actual or dummy) as the basis for verifying position of the sources and for calculating exposure time (or total dose).
 - Listing of source information, including 2. radionuclide, position, and strength.
 - Dose or dose rate at selected anatomical points. 3.
 - Initials and date of the authorized user. 4.

Source Loading -- The individual loading the sources into the applicator (before implantation) must document the exact distribution and identity of the sources in the applicator. He must also check for consistency of:

1. Physical loading of sources in applicator 2. Dosimetry plan, and

3. Written directive.

A single-page form (see attached) will be used for this purpose, i.e., for ensuring consistency of the written directive, the dosimetry plan, and the actual loading of the sources in the applicator. The form requires the signature of the physician both before and after implantation, as well as the individual who loads the sources into the applicator.

Patient Identity -- The user and/or his designed will verify the patient's identity by asking his name and confirming the name and at least one of the following with the patient's record:

- 1. Birth date
- 2. Social security number
- 3. Address
- 4. Signature
- 5. ID bracelet
- 6. Hospital ID card
- 7. Military ID card.

The method of secondary identification will be documented.

F. Questions About Procedure -- The worker (e.g., technologist, dosimetrist, physicist) shall be encouraged to ask questions if there is any confusion or uncertainty regarding the datails of the procedure, and will be instructed to not proceed if any discrepancy is noted.

G. Records -- Records generated by the QMP's procedures will be retained for a period of five years.

III. Annual Review

D.

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- A. Methodology of review -- A review of the QM program will be conducted at least annually and will include ALL brachytherapy procedures done during the review pariod. The annual review will be conducted by a committee or designated individual such that an authorized user reviews his/her own procedures. Specifically, the review will include verification of the following:
 - 1. Prior to implantation:
 - a. Radionuclide
 - b. Number of sources
 - c. Source strengths
 - d. Treatment site

- 2. After implantation but prior to completion of procedure:
 - a. Radionuclide
 - b. Total source strangth
 - c. Treatment site

- d. Exposure time (or equivalently, total doce);
- Misadministrations -- The review will include all misadministrations and corrective actions taken.
- C. Recordable events -- The review will include all recordable events and corrective actions taken.
- D. Recommendations -- The existing ON program's policies and procedures will be reevaluated for effectiveness following the annual review. Actions which are required to make the program more effective will be identified in writing as part of the review.
- E. Revisions to the QMP Revisions to the QMP following the annual review will be submitted to the facility Radiation Safety Officer for subsequent submittal to the NRC regional office.
 - Records of Annual Review -- Records of the annual review, migadministrations, and recordable events will be retained as required by 10 CFR Part 35. The Chief Medical Physicist will be responsible for maintaining these records in an auditable form.

LTC, MC / Chief, Radiation Oncology Service

Walter Reed Army Medical Center Radiation Oncology Service

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Walter Road Army Medical Custer Radiation Oncology Service

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# BRACHYTHERAPY TREATMENT WITH CESIUM-137

| To Be Completed By Desi<br>(Resed on Approved Comp                                                                                                                               | metrist pefere<br>utar Plan)                                                                                                                                                | Loading of So                                                                                                                                                 | 126061                          |               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|---------------|
| Applicator:<br>Source:<br>Otrangth:<br>Position:                                                                                                                                 |                                                                                                                                                                             |                                                                                                                                                               |                                 |               |
| Total Number of So<br>Total mg-Ra-eq:                                                                                                                                            | urces :                                                                                                                                                                     |                                                                                                                                                               |                                 | . <del></del> |
| Is this the loading use<br>Is this loading consist                                                                                                                               | d for the computent with the wr                                                                                                                                             | ter dosimetry<br>itten directi                                                                                                                                | plan?                           |               |
| DOSIMETRIST:                                                                                                                                                                     |                                                                                                                                                                             | oncolo<br>Date:                                                                                                                                               | ilst:                           |               |
| to be Completed By Dosi<br>Implantation:                                                                                                                                         | metrist/Physici                                                                                                                                                             | st After Load                                                                                                                                                 | ing sources a                   | nd Before     |
| ng Ra ag                                                                                                                                                                         | LaDa                                                                                                                                                                        | Location                                                                                                                                                      | Color                           |               |
| Tanden:                                                                                                                                                                          |                                                                                                                                                                             |                                                                                                                                                               |                                 |               |
|                                                                                                                                                                                  |                                                                                                                                                                             |                                                                                                                                                               |                                 |               |
| Ovoids:                                                                                                                                                                          |                                                                                                                                                                             |                                                                                                                                                               |                                 | _             |
| Does this loading agree                                                                                                                                                          | with the dosin                                                                                                                                                              | strist's plan                                                                                                                                                 | above?                          |               |
| DOSIMETRIST / PHYSICIST:                                                                                                                                                         |                                                                                                                                                                             | DATE:                                                                                                                                                         |                                 |               |
|                                                                                                                                                                                  |                                                                                                                                                                             |                                                                                                                                                               |                                 |               |
| To Be Completed By Onco<br>Procedure:                                                                                                                                            | logist After Im                                                                                                                                                             | plantation Bu                                                                                                                                                 | : Sefere Comp                   | letion of     |
| Po Be Completed By Onco<br>Procedure:                                                                                                                                            | logist After In<br>Insertion dat                                                                                                                                            | plantation Mu<br>e & time:                                                                                                                                    | t Before Comp                   | letien of     |
| To Be Completed By Onco<br>Procedure:                                                                                                                                            | Insertion dat<br>Treatment sit<br>Patient ID co                                                                                                                             | plantation Bu<br>e & time:<br>e:<br>ofirmed by:                                                                                                               | t Before Gesp                   | letion of     |
| Po Be Completed By Onco<br>Procedure:<br>D<br>I                                                                                                                                  | Insertion dat<br>Treatment sit<br>Patient ID co<br>Number of sou                                                                                                            | plantation Hu<br>e & time:<br>e:<br>nfirmed by:<br>roes implante:                                                                                             | t Sefore Gesp                   | letion of     |
| To Be Completed By Onco<br>Procedure:<br>I<br>A<br>3                                                                                                                             | logist After In<br>Insertion dat<br>Treatment sit<br>Patient ID co<br>Number of sou<br>Record loadin                                                                        | plantation Mu<br>a & time:<br>a:<br>nfirmed by:<br>ross implante:<br>g sequence to                                                                            | i:                              | letion of     |
| To Be Completed By Onco<br>Procedure:<br>D<br>I<br>A<br>G<br>R                                                                                                                   | logist After In<br>Insertion dat<br>Treatment sit<br>Patient ID co<br>Number of sou<br>Record loadin<br>Sources impla                                                       | plantation Bu<br>a & time:<br>a:<br>nfirmed by:<br>roes implante<br>g sequence to<br>nted as liste                                                            | i:<br>left<br>labove?           | letien of     |
| To Be Completed By Onco<br>Procedure:<br>D<br>I<br>A<br>G<br>R<br>A<br>M                                                                                                         | logist After In<br>Insertion dat<br>Treatment sit<br>Patient ID co<br>Number of sou<br>Record loadin<br>Sources impla<br>Total number<br>Total mg x ho<br>Date & time f     | plantation Mu<br>a & time:<br>a:<br>nfirmed by:<br>roes implante:<br>g sequence to<br>nted as listed<br>of hours (plassing)<br>urs:<br>or removal:            | i:<br>left<br>labove?<br>aned): | letien of     |
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| To Be Completed By Onco<br>Procedure:<br>D<br>I<br>A<br>G<br>R<br>A<br>M<br>ADDITIONAL INSTRUCTIONS<br>ONCOLOGIST:<br>To Be Completed After R                                    | Insertion dat<br>Treatment sit<br>Patient ID co<br>Number of sou<br>Record loadin<br>Sources impla<br>Total number<br>Total mg x ho<br>Date & time f                        | plantation Bu<br>a & time:<br>a:<br>nfirmed by:<br>roes implanted<br>g sequence to<br>nted as listed<br>of hours (play<br>urs:<br>or removal:<br>DATE:<br>ht: | i:<br>left<br>labove?<br>aned): |               |
| To Be Completed By Onco<br>Procedure:<br>D<br>I<br>A<br>G<br>R<br>A<br>M<br>ADDITIONAL INSTRUCTIONS<br>ONCOLOGIST:<br>To Be Completed After &<br>Date 4 time of<br>Number of sou | logist After In<br>Insertion dat<br>Treatment sit<br>Patient ID co<br>Number of sou<br>Record loadin<br>Sources impla<br>Total number<br>Total my x ho<br>Date & time f<br> | plantation Bu<br>a & time:<br>a:<br>nfirmed by:<br>roes implanter<br>g sequence to<br>nted as lister<br>of hours (play<br>urs:<br>or removal:<br>DATE:<br>ht: | i:<br>left<br>labove?<br>nned): | letien of     |
# Malter Reed Army Medical Center Radiation Oncology Service

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( 11 )

# PERMANENT SEED IMPLANT WITH GOLD-198

| PATIENT:                                             | ID:                                               | DATE:                 |                                                                                                                 |
|------------------------------------------------------|---------------------------------------------------|-----------------------|-----------------------------------------------------------------------------------------------------------------|
| To Be Completed My Dosis                             | etrist Before Loading d                           | f Sourcas:            |                                                                                                                 |
| LOADING                                              |                                                   |                       | · · · · · · · · · · · · · · · · · · ·                                                                           |
| Losation of Implant:                                 |                                                   |                       |                                                                                                                 |
| Number of seeds:                                     | Activity per seed                                 | l:                    |                                                                                                                 |
| Total activity:                                      |                                                   |                       | -                                                                                                               |
| Is this the loading used<br>Is this loading consiste | for the computer dosis<br>at with the written dir | etry plan?<br>active? | anna a stain a sa s                                                            |
| DOSINETRIST:                                         | 08<br>204                                         | COLOGIST:             |                                                                                                                 |
| To Be Completed By Dosis<br>Implantation:            | strist/Thysicist After                            | Loading Sou           | rees and Defero                                                                                                 |
| Number of seeds:                                     | Activity per mand                                 | 1                     |                                                                                                                 |
| Total activity:                                      |                                                   |                       |                                                                                                                 |
| Does this loading agree                              | with the dosimetrist's                            | plan above?           |                                                                                                                 |
| DOSINETRIST/PHYSICIST:                               | D                                                 | TB:                   |                                                                                                                 |
| To Be Completed By Oncol<br>Procedure:               | ogist After Implantatio                           | n But Befor           | e Completion of                                                                                                 |
| D                                                    | Treatment site:                                   |                       |                                                                                                                 |
| I                                                    | Patient ID confirmed b                            | A:                    | and a subscription of the second s |
| A a                                                  | Number of seeds implant                           |                       |                                                                                                                 |
| R                                                    | Record loading sequence                           | e to left             |                                                                                                                 |
| λ                                                    | Seeds implanted as lis                            | ted above?            |                                                                                                                 |
| ADD THTOP & L. TNEEDDOD TONC.                        |                                                   | · · · · ·             |                                                                                                                 |
|                                                      | ۵٬۰۰۰ کې د د د د د د د د د د د د د د د د د د      |                       |                                                                                                                 |
| ONCOLOGIST:                                          | D                                                 | TE:                   |                                                                                                                 |

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# Walter Read Army Medical Center Radiation Oncology Service

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# PERMANENT SEED IMPLANT WITH IODINE-125

| PATIENT:                                                                                                                  | ID: DAT                                                              | 31                                                                                                                                                                    |
|---------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| To Be Completed By Dosis                                                                                                  | actrist Before Loading of Sources                                    | 8                                                                                                                                                                     |
| LOADING                                                                                                                   |                                                                      |                                                                                                                                                                       |
| Location of Implant:                                                                                                      |                                                                      |                                                                                                                                                                       |
| Number of seeds:                                                                                                          | Activity per seed:                                                   |                                                                                                                                                                       |
| Total activity:                                                                                                           |                                                                      | . · ·                                                                                                                                                                 |
| Is this the loading used<br>Is this loading consiste                                                                      | d for the computer desimetry plan<br>ant with the written directive? | ?                                                                                                                                                                     |
| DOSINETRIST:                                                                                                              |                                                                      |                                                                                                                                                                       |
| To No Completed By Dosis<br>Implantation:                                                                                 | netrist/Physicist After Loading S                                    | ourses and Before                                                                                                                                                     |
| Number of seads:                                                                                                          | Activity per seed:                                                   |                                                                                                                                                                       |
| Total activity:                                                                                                           | •                                                                    | in and the second s                                                        |
| Does this loading agree                                                                                                   | with the dominatrist's plan abov                                     | e?                                                                                                                                                                    |
| DOSINETRIST/PHYSICIST:                                                                                                    | DATE:                                                                |                                                                                                                                                                       |
| To Be Completed By Oncol                                                                                                  | logist After Implantation But Bef                                    | ore Completion of                                                                                                                                                     |
| xlocednle:                                                                                                                | Insertion date & time:                                               | · ·                                                                                                                                                                   |
| D                                                                                                                         | Treatment site:                                                      |                                                                                                                                                                       |
| I                                                                                                                         | Patient ID confirmed by:                                             |                                                                                                                                                                       |
| λ                                                                                                                         | Number of seeds implanted:                                           | م مرد می از است از می از است از می می است از می از این از این<br>مراجع این می این این این این این این این این این ای |
|                                                                                                                           | Total activity implanted!                                            |                                                                                                                                                                       |
| - <b>R</b>                                                                                                                | Sanda implanted as listed above                                      | ?                                                                                                                                                                     |
| X                                                                                                                         |                                                                      |                                                                                                                                                                       |
|                                                                                                                           |                                                                      |                                                                                                                                                                       |
| Additional instructions:                                                                                                  |                                                                      |                                                                                                                                                                       |
| ONCOLOGIST :                                                                                                              | DATE:                                                                |                                                                                                                                                                       |
| <u> المراجع ا</u> |                                                                      |                                                                                                                                                                       |

22 March 1994

HSHL-XN

#### QUALITY MANAGEMENT

- I. Quality Management Program, WRAMC Nuclear Medicine Service
  - A. The five objectives are:
    - 1. Written directive given prior to administration.
    - 2. Patient I.D. verified by more than one method.
    - 3. Final plans of treatment and calculations are in accordance with written directives.
    - 4. Each administration in accordance with written directives.
    - 5. Any unintended deviation from written directives is I.D.'d, evaluated, and appropriate action is taken.
  - B. Develop procedures for and conduct a review of the QMP including:
    - 1. All misadministration.
    - 2. All recordable events.
    - 3. A sampling of patient administrations... at intervals no greater than 12 months.
      - 4. Retain records for three years.
- II. Radiopharmaceutical QMP
  - C. For all Radiopharmaceutical Therapies and Diagnostic Iodine 131 & 125; Iodine MIBG & NP59; Strontium-89 Chloride, and Phosphorus-32 IV.
    - Authorized user Sign and date written directive (Radiopharmaceutical, Dosage, Route of Administration) before administration. (Delays, oral directives and revisions OK under certain circumstances. 10 CFR 35.32(a)(1).).
    - 2. User and/or Designee verify patient identity by more than one method:
      - a) Ask patient name, confirm, and,
      - b) Birth date, or
      - c) Social security number, or
      - d) Address, or
      - e) Signature, or
      - f) ID Bracelet, or
      - g) Hospital ID card, or
      - h) Military ID card.

#### II. Radiopharmaceutical QMP cont.

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- 3. Person administering dose verify details of administration:
  - a) Radiopharmaceutical
  - b) Dose
  - c) Route of Administration
- 4. Encourage worker to ask questions.
- 5. User or supervised person date and sign/initial written record (chart).

\*\*See enclosure Radiopharmaceutical Administration Checklist\*\*

III. Annual Review

- 6. At least annually the QMP review will consist of:
  - a) Random Sample of therapies representative of the following patient administrations:

| Lot size | Sample size | Acceptance<br>No. |  |
|----------|-------------|-------------------|--|
| 20       | ALL         | 0                 |  |
| 21 - 100 | 20          | 0                 |  |
| >100     | 20%         | 0                 |  |

b) All misadministration

c) All recordable events.

For each patient case, compare administered vs. prescribed for

- a) Written directive complete
- b) Patient identity verified
  - c) Radiopharmaceutical
- d) Dose
- e) Route of administration

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ANA A. RODRIGUEZ O COL, MC CHIEF, NUCLEAR MEDICINE SERVICE

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#### RADIOPHARMACEUTICAL ADMINISTRATION CHECKLIST

(To be filled out by individuals administering a therapeutic dosage of any radiopharmaceutical other than sodium iodine I-125 or I-131 (SR-89 MIBG, NP-59, P-32), or any dosage greater than 30 microcuries of sodium iodide I-125 or I-131).

PLACE RADIOPHARMACEUTICAL STICKER HERE

DIRECTIONS: Complete the items below in the order listed, and initial each item when completed. If you do not fully understand how to carry out the written directive (PRESCRIPTION/CONSENT FORM) for this administration, halt the procedure and contact the Chief, Nuclear Medicine Service, or other authorized user immediately.

#### PART I - BEFORE ADMINISTRATION

| Attach a game of the written directive (PRESCRIDETON/CONSENT FORM)                                                                                                                                                                                                                                                                        |          |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| for the dosage prepared.                                                                                                                                                                                                                                                                                                                  | initials |
| The written directive (PRESCRIPTION/CONSENT FORM) is signed and dated by an authorized user.                                                                                                                                                                                                                                              | initials |
| The patient's identity checked verbally and confirmed as the individual<br>named in the written directive (PRESCRIPTION/CONSENT FORM) by comparison<br>with corresponding information in the patient's record using at least one<br>of the following means of identification.<br>(Listed in order of preference. Check applicable means.) | initials |
| <pre>1Military ID card 2Name on the patient's ID bracelet 3Drivers license photo 4Other (SSANBirth dateAddressSignature)</pre>                                                                                                                                                                                                            |          |
| The radiopharmaceutical to be administered is the same as that identified on the written directive (PRESCRIPTION/CONSENT FORM).                                                                                                                                                                                                           | initials |
| Route of administration (circle): I.V. I.M. P.O. Other(what?)                                                                                                                                                                                                                                                                             |          |
| The dosage to be administered is the same as that identified on the written directive (PRESCRIPTION/CONSENT FORM).                                                                                                                                                                                                                        | initials |
| Laboratory test results (Beta HCG, TSH, CBC, etc) have been reviewed.                                                                                                                                                                                                                                                                     | initials |
| PART II - AFTER ADMINISTRATION                                                                                                                                                                                                                                                                                                            |          |
| Date and time of dose administration:                                                                                                                                                                                                                                                                                                     |          |
| Record, date, and initial the administered dosage on the patients's consult, and place in the Nuclear Medicine Folder.                                                                                                                                                                                                                    | initials |
| REVIEWED BY (AUTHORIZED USER):                                                                                                                                                                                                                                                                                                            |          |
| S IGNATURE DATE                                                                                                                                                                                                                                                                                                                           |          |

# SEP 2 8 1994

### ARMY, DEPARTMENT OF THE WALTER REED ARMY MEDICAL CENTER WASHINGTON, DC 20307-5001

1 1

ATTN: LTC ARTHUR G. SAMILJAN,

RE: Docket Number: 030-01317 License Number: 08-01738-02 Plan File Date: 27-JAN-92 Region Number: 1

#### Dear Mr. Samiljan:

This refers to the review of your written Quality Management Program (QMP) submitted in accordance with 10 CFR 35.32. A review of the QMP was performed to determine whether policies and procedures have been developed to meet the objectives of the rule. Based on this submission, there appear to be significant weaknesses and potential substantial failure of your QMP to meet the objectives in 10 CFR 35.32 in that:

#### Regarding Brachytherapy

- 1 A written QMP must be established and maintained for each Brachytherapy use as required in 10 CFR 35.32(f)(1). Please submit your QMP for your Brachytherapy program.
- 2 Please be advised that multiple misadministrations and other errors have occurred due to sources that are inaccurately placed or have moved. In addition, wrong organs have been irradiated as a result of unintentional and undetected movement of the source, once implanted. Each licensee should review their procedures to ensure that source positions are verified and frequently checked.

Regarding I-125 and /or I-131 > 30 microcuries

1 A written QMP must be established and maintained for each I-125 and /or I-131 > 30 microcuries use as required in 10 CFR 35.32(f)(1). Please provide your QMP for your NaI I-125 or I-131 >30 microcuries. Regarding Therapeutic Radiopharmaceutical other than I-125 and/or I-131

1 A written QMP must be established and maintained for use of Radiopharmaceuticals for therapy other than I-125 and I-131 as required in 10 CFR35.32(f)(1). Please submit your QMP for your Radiopharmaceutical therapy.

To meet the requirements in 10 CFR 35.32, you may choose to utilize the procedures described in Regulatory Guide 8.33(enclosed), or submit procedures that are equivalent. If you choose to use Regulatory Guide 8.33, be certain that the procedures you select are adjusted to meet the specific needs of your program as necessary. Additionally, you are reminded that training and/or instruction of supervised individuals in your QMP is required by 10 CFR 35.25.

Due to the apparent failure of your written QMP to meet the objectives in 10 CFR 35.32, you must immediately modify your written QMP to address the items listed above, and provide those modifications to your NRC regional office within 30 days of the date of this letter. NRC will review these matters during your next routine NRC inspection to determine whether violations of NRC requirements have occurred. Enforcement action may be taken at that time for failure to meet the requirements of 10 CFR 35.32.

Please be advised that this QMP will not be incorporated into your license by condition. This allows you the flexibility to make changes to your quality management program without obtaining prior NRC approval. When modifications are made to your program, You should submit any changes to your QMP to this Office within 30 days as required by 10 CFR 35.32(e).

Your QMP was reviewed by an NRC contractor following a standard review plan and related checklist provided by the NRC staff. This letter outlining the findings of that review was prepared by the contractor utilizing standard paragraphs previously reviewed and approved by NRC headquarters and regional management. If you have any questions about this review, you may call me at (610)337-5309. Thank you for your cooperation in this matter.

Sincerely,

James P. Dwyer Quality Management Program Coordinator Region I

Enclosure: As stated

# DEPARTMENT OF THE ARMY

WALTER REED ARMY MEDICAL CENTER WASHINGTON, DC 20307-5001

September 15, 1994

Health Physics Office

TTENTION OF:

030-01317

SUBJECT: Quality Management Program (QMP) Revision

Nuclear Materials Safety Branch Division of Radiation Safety and Safeguards ATTENTION: QMP Coordinator U.S. Nuclear Regulatory Commission, Region I 475 Allendale Road King of Prussia, Pennsylvania 19406-1415

Dear QMP Coordinator

Walter Reed Army Medical Center uses radioactive material authorized by US Nuclear Regulatory Commission Byproduct Material License Number 08-01738-02 with an expiration date of June 30, 1999. This a medical broadscope Type A license for human use and research.

The Radiation Oncology Service has just completed a comprehensive review and total revision of the Brachytherapy Quality Management Program SOP. The new Brachytherapy QMP was approved and became effective September 1, 1994. Please note that the Radiopharmaceutical QMP, dated 22 March 1994, has not been changed. This revision only effects the Brachytherapy QMP.

The Brachytherapy QMP and supporting forms are submitted as required by 10 CFR 35.32(e). If you have any questions regarding this submittal, please contact the undersigned at 301 427-5104.

WILLIAM B. JOHNSON Lieutenant Colonel, U.S. Army Chief, Health Physics Office

Enclosures as

ML 10 SEP 23 1994

HSHL-XR

#### BRACHYTHERAPY QUALITY MANAGEMENT PROGRAM SOP

- I. Quality Management Program
  - The five objectives which this program aims to achieve λ... with high confidence are:
    - Written directive given prior to administration. 1.
    - Patient I.D. verified by more than one method. 2.
    - Final plan of treatment and dosimetry calculations 3.
    - are in accordance with the written directive. Source loading, prior to implantation, in accordance with written directive. 4.
    - Any unintended deviation from the written directive 5. is identified, evaluated, and appropriate action taken.

Periodic review of the OMP includes: B.

- 1. All misadministrations.
- All recordable events. 2.
- All brachytherapy procedures. 3.
- 4. Prequency of review at least annually.
- Retain records for three years. 5.

#### I. II. **GUP** for Brachytherapy

- Written Directive -- A written directive must be signed λ. and dated by the authorized user prior to administration of the brachytherapy dose. This must include:
  - Name of patient. 1.
  - 2. Radionuclide.
  - 3. Treatment site.
  - 4. Applicator.
  - 5. Cumulative dose and anatomical dose point.
- Oral Directives -- Oral directives will generally not be В. issued. However, if an oral directive is given to modify a written directive, then the recommendations for documentation as specified in NRC Guide 8.33 will be followed.
- Dosimetry Plan -- A (computer) desimetry plan must be C. accepted by the authorized user prior to implantation. This plan must include:
  - Radiographic localization of sources (either actual 1. or dummy) as the basis for verifying position of the sources and for calculating exposure time (or total dose).
  - Listing of source information, including 2. radionuclide, position, and strength.
  - Dose or dose rate at selected anatomical points. 3.
  - Initials and date of the authorized user. 4.

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all - I - Care And Constants

Source Loading --- The individual loading the sources into the applicator (before implantation) must document the exact distribution and identity of the sources in the applicator. He must also check for consistency of:

1. Physical loading of sources in applicator

- 2. Dosimetry plan, and
- 3. Written directive.

A single-page form (see attached) will be used for this purpose, i.e., for ensuring consistency of the written directive, the dosimetry plan, and the actual loading of the sources in the applicator. The form requires the signature of the physician both before and after implantation, as well as the individual who loads the sources into the applicator.

Patient Identity -- The user and/or his designee will verify the patient's identity by asking his name and confirming the name and at least one of the following with the patient's record:

- 1. Birth date
- 2. Social security number
- 3. Address
- 4. Signature
- 5. ID bracelet
- 6. Hospital ID card
  - 7. Military ID card.

The method of secondary identification will be documented.

- F. Questions About Procedure -- The worker (e.g., technologist, dosimetrist, physicist) shall be encouraged to ask questions if there is any confusion or uncertainty regarding the datails of the procedure, and will be instructed to not proceed if any discrepancy is noted.
- G. Records -- Records generated by the QMP's procedures will be retained for a period of five years.

#### III. Annual Review

- A. Methodology of review -- A review of the QM program will be conducted at least annually and will include ALL brachytherapy procedures done during the review period. The annual review will be conducted by a committee or designated individual such that an authorized user reviews his/her own procedures. Specifically, the review will include verification of the following:
  - 1. Prior to implantation:
    - a. Radionuclide
    - b. Number of sources
    - c. Source strengths
    - d. Treatment site

- 2. After implantation but prior to completion of procedure:
  - a. Radionuclide
  - b. Total source strength
  - c. Treatment site
  - d. Exposure time (or equivalently, total dose);
- Misadministrations -- The review will include all misadministrations and corrective actions taken.
- C. Recordable events -- The review will include all recordable events and corrective actions taken.
- D. Recommendations -- The existing QN program's policies and procedures will be reevaluated for effectiveness following the annual review. Actions which are required to make the program more effective will be identified in writing as part of the review.
- E. Revisions to the QMP Revisions to the QMP following the annual review will be submitted to the facility Radiation Safety Officer for subsequent submittel to the NRC regional office.
- F. Records of Annual Review -- Records of the annual review, misadministrations, and recordable events will be retained as required by 10 CFR Part 35. The Chief Medical Physicist will be responsible for maintaining these records in an auditable form.

LTC, MC V Chief, Radiation Oncology Service

# Walter Read Army Medical Center Radiation Oncology Service

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# TANDEM & OVOIDS IMPLANT WITH CESIUM-137

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| Qvoide:                               | ······                     | <del>العان بر برور م</del> ع <del>د المعاد من مع</del> د من معاد من م | <b>And Constant of C</b> | · · · · ·                                | · · · · · ·                              |
| bes this load                         | ling agree                 | with the dosi                                                                                                                         | metrist's plan                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | above?                                   | *****                                    |
| OSINETRIST/PE                         | YSICIST:                   |                                                                                                                                       | DATE;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                          |                                          |
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| <b>t</b>                              |                            | Sources impla                                                                                                                         | inted as lister                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 1 above? 🦳                               |                                          |
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Walter Reed Army Medical Center Radiation Oncology Service

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# BRACHYTHERAPY TREATMENT WITH CESIUM-137

|                                                                                                                                 | ID:                                                                                                                                                                                                                                                          | Contraction of the second s                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | DATE                                               |
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| DOST TIONAL INSTRUCTIONS<br>NCOLOGIST:                                                                                          | B with the dosi<br>plogist After I<br>Insertion da<br>Treatment si<br>Patient ID c<br>Number of so<br>Record loadi<br>Sources impl<br>Total number<br>Total mg x h<br>Date & time<br>S:<br>Lemoval of Impl<br>of actual removed:                             | DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DATE:<br>DA                                                                                                                                                                                                                                                                                                                                                                                                                                                    | above?                                             |

# Walter Reed Army Medical Center Radiation Oncology Service

# PERMANENT SEED IMPLANT WITH GOLD-198

| ******                                                                   | ID:                                                                                                                                                                                                                            | DATE:                 |
|--------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| To Be Completed By Dosi                                                  | metrist Before Loading of Sou                                                                                                                                                                                                  | 2946 :                |
| LOADING                                                                  |                                                                                                                                                                                                                                |                       |
| Location of Implant:                                                     |                                                                                                                                                                                                                                | wher-                 |
| Number of seeds:                                                         | Activity per seed:                                                                                                                                                                                                             |                       |
| Total activity:                                                          |                                                                                                                                                                                                                                |                       |
| Is this the loading use<br>Is this loading consist                       | d for the computer dosimetry<br>ent with the written directiv                                                                                                                                                                  | plan?                 |
| Dosimetrist:                                                             | ONCOLOG<br>DATE:                                                                                                                                                                                                               | IST:                  |
| To Be Completed By Dosis<br>Implementation:                              | netrist/Thysisist After Loudi                                                                                                                                                                                                  | ng Sources and Befere |
| Number of seeds:                                                         | Activity per seed:                                                                                                                                                                                                             |                       |
| Total activity:                                                          | a an                                                                                                                                                                                       |                       |
| Does this loading agree                                                  | with the dosimetrist's plan                                                                                                                                                                                                    | above?                |
| DOSINETRIST/PHYSICIST:                                                   | DATE: _                                                                                                                                                                                                                        |                       |
| To Be Completed By Onco<br>Frocedure:<br>D<br>I<br>A<br>G<br>R<br>A<br>M | logist After Implantation But<br>Insertion date & time:<br>Treatment site:<br>Patient ID confirmed by:<br>Number of seeds implanted:<br>Total activity implanted:<br>Record loading sequence to<br>Sweds implanted as listed a | Before Completion of  |
| Additional Instructions:                                                 | · · · · · · · · · · · · · · · · · · ·                                                                                                                                                                                          |                       |
| ONCOLOGIST:                                                              | DATE: _                                                                                                                                                                                                                        |                       |

Section 1

というための部分が正式のなどのである。

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3.

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Written directives for brachytherapy, other than high-dose-rate remote afterloading brachytherapy, as defined in 10CFR35.2, must include: the radioisotope, number of sources, and source strengths; and after implantation, but prior to completion of the procedure: the radioisotope, treatment site, and total source strength and exposure time (or, equivalently, the total dose). Your QMP must include a written policy/procedure which requires that any written directives for brachytherapy doses will include all treatment parameters prior to administration. Your QMP is missing procedures to require that the written directive include:

(a)Order for a specific patient.

(b)Dated and signature of authorized user

(c)Prior to implantation:

(d) the radioisotope,

(c) number of sources,(f) source strengths;.

(g)After implantation, but prior to completion of the procedure:

(h) the radioisotope,

(i) treatment site,

(i) total source strength and exposure time (or, equivalently, the total dose)

60. Documentation of oral revisions and oral directives:

a. Policies/Procedures for documentation of oral revisions to existing written directive signed and dated by an a.u. or physician under the supervision of an a.u. <u>within 48 hours of</u> the oral revision

A footnote to 10 CFR 35.32(a)(1) provides that an oral revision to a written directive is acceptable if, because of the patient's condition, a delay in order to provide a written revision to an existing written directive would jeopardize the patient's health. Oral revisions must be documented immediately in the patient's record and a revised written directive must be signed and dated by an authorized user or physician under the supervision of an authorized user within 48 hours of the oral revision. Please include such a policy in your QMP.

b. If, a delay in order to provide a written directive would jeopardize the patients health, an oral directive will be acceptable, provided that information is documented immediately in the patient's record and a written directive is prepared within 24 hours of the oral directive. Please include such a provision in your QMP

If, because of the emergent nature of the patient's condition, a delay in order to provide a written directive would jeopardize the patients health, an oral directive will be acceptable, provided that the information provided in the oral directive is documented immediately in the patient's record and a written directive is prepared within 24 hours of the oral directive.

61. Revisions to written directives dated and signed by a.u. <u>prior to</u> <u>administration</u> of brachytherapy dose or next fraction of brachytherapy dose

Revisions to written directives for brachytherapy may be made provided that the revision is dated and signed by an authorized user prior to the administration of the brachytherapy dose or the next brachytherapy fractional dose. Your QMP must include a policy/procedure that requires that revisions to written directives will be made <u>prior</u> to administration of the brachytherapy dose or next fractional brachytherapy dose.

# OBJECTIVE 2 - PATIENT IDENTITY VERIFICATION [10 CFR 35.32 (a)(2)]

62. Procedure to verify patient's identity by more than one method prior to administration

Procedures to verify the patient's identity by more than one method prior to administration, as required by 10 CFR 35.32(a)(2) have not been adequately addressed

December 6, 1993

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YES NO (23d)

YES V NO (18b)

 $_{\rm YES}$   $\stackrel{\sqrt{}}{\sim}$  NO (18a)

 $YES \vee NO (22)$ 

Brachytherapy

in your QMP. Your QMP must include a policy/procedure to require that, prior to each Brachytherapy administration, the patient's identity will be verified by more than one method as the individual named in the written directive as required by 10 CFR 35.32(a)(2).

## OBJECTIVE 3 - TREATMENT PLANS VERIFICATION (NOT APPLICABLE TO RADIOPHARMACEUTICAL THERAPY)

- 63. For brachytherapy other than high-dose-rate remote afterloaders:
- a. a plan of treatment will be prepared in accordance with the respective written directive.
- b. procedures for performing a check of dose calculations (i.e., computer-generated dose calculations and/or manual dose calculations). Dose calculations checked by an authorized user or a qualified person under the supervision of an authorized user (e.g., a radiation therapy physicist, oncology physician, dosimetrist, or radiation therapy technologist), who whenever possible did not make the original calculations.
- c. verification of the position of dummy sources or fixed geometry applicators prior to inserting sealed sources
- d. performance of acceptance testing on each treatment planning or dose calculating computer program that could be used for dose calculations, and checking computer generated dose calculations

Your submittal does not include policies/procedures that ensure that final plans of treatment and related calculations for brachytherapy are in accordance with the written directive as required by 10 CFR 35.32(a)(3). Your procedures should require that:

- a. a plan of treatment will be prepared in accordance with the respective written directive.
- b. procedures for performing a check of dose calculations (i.e., computer-generated dose calculations and/or manual dose calculations) are prepared. Procedures for checking the dose calculations before administration of the prescribed brachytherapy dose. An authorized user or a qualified person under the supervision of an authorized user (e.g., a radiation therapy physicist, oncology physician, dosimetrist, or radiation therapy technologist), who whenever possible did not make the original calculations, should check the dose calculations.
- c. verification of the position of dummy sources or fixed geometry applicators prior to inserting sealed sources, is accomplished
- d. acceptance testing on each treatment planning or dose calculating computer program that could be used for dose calculations, and checking computer generated dose calculations is performed.

**OBJECTIVE 4 - VERIFICATION PRIOR TO ADMINISTRATION TO WRIT** DIRECTIVE [10 CFR 35.32(a)(4)]

64a. Procedures to ensure, before administration, that each administration is in accordance with the written directive.

NO (29d)

December 6, 1993

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## Brachytherapy

YES  $\vee$  NO (24c)

YES NO (24a)

YES VNO (24b)



December 6, 1993

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Brachytherapy

## EVALUATION AND RESPONSE TO RECORDABLE EVENTS [10 CFR 35,32(c)]

68b. Commitment for evaluation and response to each recordable event by: (i) assembling the relevant facts including the cause; (ii) identifying what, if any, corrective action is required to prevent recurrence; and (iii) retaining a record, in an auditable form, for three years, of the relevant facts and what corrective action was taken.

As required in 10 CFR35.32(c), the licensee shall evaluate and respond, within 30 days after discovery of the recordable event, to each recordable event by:(i) assembling the relevant facts including the cause; (ii) identifying what, if any, corrective action is required to prevent recurrence; and (iii) retaining a record, in an auditable form, for three years, of the relevant facts and what corrective action was taken.

# PERIODIC REVIEWS OF THE OM PROGRAM [10 CFR 35.32(b)]

69. Time intervals (intervals not to exceed 12 months)

Your submittal for Brachytherapy does not provide adequate procedures to conduct periodic reviews of your QMP as required by 10 CFR 35.32(b). You must include the time intervals for your reviews These reviews should be conducted at intervals no greater than 12 months.

70. Review includes an evaluation of acceptable representative sample of all patient administrations, all recordable events, and misadministrations

Your QMP review does not provide an evaluation of (i) an adequate representative sample of patient administrations (ii) all recordable events, and (iii) all misadministrations since the last review as required in 10 CFR 35.32(b)(1). The number of patient cases to be sampled should be based on the principles of statistical acceptance sampling and should represent each modality performed in the institution (e.g., radiopharmaceutical, teletherapy, brachytherapy, and gamma stereotactic radiosurgery). You may develop a sampling procedure of your own; use the chart provided in 10 CFR 32.110 (assuming an error rate of 2 percent); or a representative sample may be selected including (at a minimum): 20% if the number of cases performed is greater than 100, 20 cases if the number of cases is between 20 and 100, and all, if the number of cases is less than 20.) Provide a copy of your revised QMP to include this provision.

71. Includes procedure to expand review if recordable events or misadministration is uncovered during the periodic review of your QMP.

According to guidance provided by Regulatory Guide 8.33, your QMP should include a procedure to expand the number of cases reviewed when a misadministration or recordable event is uncovered during the periodic review of your QMP. Please include this provision in your QMP.

72. Procedures for determining the effectiveness of the QM program and, if necessary, making modifications to meet the objectives of the program

Describe your procedures to evaluate the effectiveness of the QMP, and, if necessary, to make modifications to meet the objectives of the program as required by 10 CFR 35.32(b)(2).

NO (36d) YES

YES

NO (1)

YES XNO (37)

|      |                                                                                                                                                                           | 1       |
|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| .73. | 3. Modifications to QM program submitted to NRC within 30 YES<br>days after modification has been made                                                                    | NO (40) |
|      | Please provide assurance that modifications to your QMP will be submitted to the NRC within 30 days after the modification has been made as required by 10 CFR 35.32 (e). | ,       |
| 74.  | <ol> <li>Records of each review and evaluation to be maintained for 3YESyears</li> </ol>                                                                                  | NO (41) |
|      | Please provide assurance that records of each review and evaluation will be maintained for three years as required in 10 CFR 35.32 (b)(3).                                |         |
| CON  | MMENTS: No birchy QMP                                                                                                                                                     |         |
|      |                                                                                                                                                                           |         |

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# Brachytherapy

Quality Management Program for I-125 and/or I-131 > 30uCi A written QMP for I-125 and/or I-131>30 uCi was provided. YES 75. NO (3e) A written QMP must be established and maintained for each I-125 and/or I-131>uCi use as required in 10 CFR 35.32(f)(1). Please provide your QMP for your NaI I-125 or I-131 >30 microCi. YES 76. Written certification that QM program has been implemented NO (4) Each applicable Part 35 licensee is required to submit a written certification that their QMP has been implemented along with a copy of their plan, pursuant to 10 CFR 35.32(f)(2). Please provide written certification that your QMP has been implemented. OBJECTIVE 1 - WRITTEN DIRECTIVE [10 CFR 35.32(a)(1)] NO (7) YES 77a. A written directive is prepared for administration of greater than 30 uCi of I-125 and/or I-131 The preparation of written directives prior to the administration of quantities greater than 30 microcuries of either sodium iodide I-125 or I-131 is required by 10 CFR 35.32(a)(1). Your QMP must include a written policy that requires that such a written directive be prepared prior to each patient administration. The QMP provides procedures to require that the written directive include: YES /NO (8a) 77b. an order for a specific patient..... 77c. date and signature of authorized user..... YES NO (8b) dosage to be administered..... YES NO (8c) 77d.

The written directive must be an order for a specific patient, dated and signed by an authorized user or physician under the supervision of an authorized user, and, for any administration of quantities greater than 30 microcuries of either I-125 or I-131, the dosage. Your QMP is missing procedures to require that the written directive for I-125 and/or I-131>30 uCi:

- (a) be an order for a specific patient(b) is dated and signed by the authorized user
- (c) contains the dosage to be administered.
- 78. Documentation of oral revisions and oral directives:
- a. Documentation of oral revisions to existing written directive signed and dated by an a.u. or physician under the supervision of an a.u. within 48 hours of the oral revision

A footnote to 10 CFR 35.32(a)(1) provides that an oral revision to a written directive is acceptable if, because of the patient's condition, a delay in order to provide a written revision to an existing written directive would jeopardize the patient's health. Oral revisions must be documented immediately in the patient's record and a revised written directive must be signed and dated by an authorized user or physician under the supervision of an authorized user within 48 hours of the oral revision. Please include such a policy in your QMP.

YES

NO (18a)

NO (18b) YES If, a delay in order to provide a written directive would b. . jeopardize the patients health, an oral directive will be acceptable, provided that information is documented immediately in the patient's record and a written directive is prepared within 24 hours of the oral directive. Please include such a provision in your QMP If, because of the emergent nature of the patient's condition, a delay in order to provide a written directive would jeopardize the patients health, an oral directive will be acceptable, provided that the information provided in the oral directive is documented immediately in the patient's record and a written directive is prepared within 24 hours of the oral directive. 79. Revisions to written directives dated and signed by a.u. prior to YES NO (19) administration of a radiopharmaceutical dosage Revisions to written directives may be made for any diagnostic or therapeutic procedure provided that the revision is dated and signed by an authorized user prior to the administration of the radiopharmaceutical dosage. Your QMP must include a policy/procedure that requires that revisions to written directives will be made prior to administration. OBJECTIVE 2 - PATIENT IDENTITY VERIFICATION [10 CFR 35.32 (a)(2)] Procedure to verify patient's identity by more than one 80. YES \_ NO (23e) method prior to administration Procedures to verify the patient's identity by more than one method prior to administration, as required by 10 CFR 35.32(a)(2) have not been adequately addressed in your QMP. Your QMP must include a policy/procedure to require that, prior to each NaI I-125 or I-131 >30 microCi administration, the patient's identity will be verified by more than one method as the individual named in the written directive as required by 10 CFR 35.32(a)(2) 10 CFR 35.32(a)(2). **OBJECTIVE 3 - TREATMENT PLANS VERIFICATION (NOT APPLICABLE TO** RADIOPHARMACEUTICAL ADMINISTRATION) **OBJECTIVE 4 - VERIFICATION PRIOR TO ADMINISTRATION TO WRITTEN DIRECTIVE** [10 CFR 35.32(a)(4)] Procedures to ensure, before administration, that each 81a. YES NO (27a) administration is in accordance with the written directive. Your submittal for I-125 and/or I-131 > 30uCi administration does not include policies/procedures that ensure that each administration is in accordance with the written directive as required by 10 CFR 35.32(a)(4). Describe your policy/procedure to verify, before administering the byproduct material, that the specific details of the administration are in accordance with the written directive. 81b. For I-125 and/or I-131 > 30uCi: YES NO (27b) 10,8-2. Dosage measured in dose calibrator and results compared with the prescribed dosage in the written directive

According to guidance provided by Regulatory Guide 8.33, the dosage, should be confirmed by the person administering the radiopharmaceutical to verify agreement with the written directive, that is, the dosage should be measured in the dose calibrator and the results compared with the prescribed dosage in the written directive. Please provide such (or similar) procedures in your QMP.

December 6, 1993

I-125 and/or I-131 >30uCi

Commitment for all workers to seek guidance if they do not YES NO (31) ·82: understand how to carry out the written directive Your QMP must include a policy for instruction of all workers to seek guidance if they do not understand how to carry out the written directive. Please include such a provision in your QMP. YES XNO (32) 83. A written directive and records of each administered I-125 and/or I-131>30 uCi must be maintained for three years. A commitment to retain each written directive and a record of each administered radiopharmaceutical dosage for three years after the date of administration is required in 10 CFR 35.32(d). Describe the procedure for an authorized user or a qualified individual under the supervision of an authorized user (e.g., a nuclear medicine physician, physicist, or technologist), after administering a radiopharmaceutical, to make, date, sign or initial a written record that documents the administered dosage in an auditable form. OBJECTIVE 5 - UNINTENDED DEVIATIONS [10 CFR 35.32(a)(5)] YES // NO (34e) 84. Policies/Procedures for identification and evaluation of unintended deviations from the written directive Your QMP for NaI I-125 or I-131 >30 microCi must include policies/procedures to identify and evaluate any unintended deviations from a written directive and to institute corrective actions to be taken after the deviation has been identified as required by 10 CFR 35.32(a)(5). Please include such a provision in your QMP. YES NO (35) Institution of corrective actions to be taken after the deviation 85a. has been identified Your QMP must include policies/procedures to institute corrective actions to be taken after an unintended deviation has been identified. EVALUATION AND RESPONSE TO RECORDABLE EVENTS [10 CFR 35.32(c)] YES X NO (1) 85b. Commitment for evaluation and response to each recordable event by: (i) assembling the relevant facts including the cause; (ii) identifying what, if any, corrective action is required to prevent recurrence; and (iii) retaining a record, in an auditable form, for three years, of the relevant facts and what corrective action was taken. As required in 10 CFR35.32(c), the licensee shall evaluate and respond, within 30 days after discovery of the recordable event, to each recordable event by:(i) assembling the relevant facts including the cause; (ii) identifying what, if any, corrective action is required to prevent recurrence; and (iii) retaining a record, in an auditable form, for three years, of the relevant facts and what corrective action was taken. PERIODIC REVIEWS OF THE OM PROGRAM [10 CFR 35.32(b)] YES NO (36e) 86. Time intervals (intervals not to exceed 12 months) Your submittal for NaI I-125 or I-131 >30 microCi does not provide adequate procedures to conduct periodic reviews of your QMP as required by 10 CFR 35.32(b). You must include the time intervals for your reviews. These reviews should be conducted at intervals no greater than 12 months.

# Walter Reed Army Medical Center Radiation Oncology Service

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# PERMANENT SEED IMPLANT WITH IODINE-125

| 92322W71                                             |                                         | ی د معند با به با<br>۱۹۹۹ - ۲۰۰۹<br>۲۰۰۰ - ۲۰۰۹<br>۱۹۹۹ - ۲۰۰۹ - ۲۰۰۹ | DA751         | March and a Color Manager and Participation                                                                     |
|------------------------------------------------------|-----------------------------------------|-----------------------------------------------------------------------|---------------|-----------------------------------------------------------------------------------------------------------------|
| To Be Completed By Dosi                              | metrist Before L                        | oading of so                                                          | urces :       | in an ann an Anna an A  |
| LOADING                                              |                                         |                                                                       |               |                                                                                                                 |
| Location of Implant:                                 |                                         |                                                                       |               |                                                                                                                 |
| Number of seeds:                                     | Activity                                | per seed:                                                             |               |                                                                                                                 |
| Total activity:                                      |                                         |                                                                       |               |                                                                                                                 |
| Is this the loading used<br>Is this loading consiste | d for the compute<br>ant with the write | er dosimetry<br>tten directi                                          | plan?         |                                                                                                                 |
| DOSINSTRIST:                                         |                                         | ONCOLO<br>DATE:                                                       | GIST:         |                                                                                                                 |
| To No Completed By Domin<br>Implantation:            | netrist/Physicis                        | t After Load                                                          | ing Sources   | and Before                                                                                                      |
| Number of seeds:                                     | Activity                                | per seed:                                                             |               |                                                                                                                 |
| Total activity:                                      | •                                       |                                                                       |               | a a construction for more determined of a super-                                                                |
| boss this loading agree                              | with the dosimet                        | trist's plan                                                          | above?        |                                                                                                                 |
| DOSINETRIST/PHYSICIST:                               |                                         | DATE:                                                                 |               |                                                                                                                 |
| To Be Completed By Oncol<br>Procedure:               | logist After Imp                        | lastation Bu                                                          | t Before Cor  | pletion of                                                                                                      |
| _                                                    | Insertion date                          | s time:                                                               |               |                                                                                                                 |
| D                                                    | Treatment site:                         | ;<br>Réannadh Tassa                                                   | - <del></del> |                                                                                                                 |
| 1                                                    | Withow of good                          | (lrned by:                                                            |               | and and a second se  |
|                                                      | Matal activity                          | invianted;                                                            |               |                                                                                                                 |
|                                                      | Record loading                          | seduance to                                                           | left          | and the second secon |
| <b>X</b>                                             | Seeds implanted                         | i as listed a                                                         | bove?         |                                                                                                                 |
| M                                                    |                                         |                                                                       |               |                                                                                                                 |
|                                                      |                                         |                                                                       |               |                                                                                                                 |
| Additional instructions:                             |                                         |                                                                       | ·····         |                                                                                                                 |
|                                                      |                                         | DATE :                                                                |               |                                                                                                                 |

#### ) DEPARIMENT OF THE ARMY () WALTER REED ARMY MEDICAL CENTER WASHINGTON, DC 20307-5001

LICENSE NO. 08-01738-02 HSHL-XN

#### DOCKET NO. 030-01317

22 March 1994

#### QUALITY MANAGEMENT

- I. Quality Management Program, WRAMC Nuclear Medicine Service
  - A. The five objectives are:
    - 1. Written directive given prior to administration.
    - 2. Patient I.D. verified by more than one method.
    - 3. Final plans of treatment and calculations are in accordance with written directives.
    - 4. Each administration in accordance with written directives.
    - 5. Any unintended deviation from written directives is I.D.'d, evaluated, and appropriate action is taken.
  - B. Develop procedures for and conduct a review of the QMP including:
    - 1. All misadministration.
    - 2. All recordable events.
    - 3. A sampling of patient administrations... at intervals no greater than 12 months.
    - 4. Retain records for three years.
- II. Radiopharmaceutical QMP
  - C. For all Radiopharmaceutical Therapies and Diagnostic Iodine 131 & 125; Iodine MIBG & NP59; Strontium-89 Chloride, and Phosphorus-32 IV.
    - Authorized user Sign and date written directive (Radiopharmaceutical, Dosage, Route of Administration) before administration. (Delays, oral directives and revisions OK under certain circumstances. 10 CFR 35.32(a)(1).).
    - 2. User and/or Designee verify patient identity by more than one method:
      - a) Ask patient name, confirm, and,
      - b) Birth date, or
      - c) Social security number, or
      - d) Address, or
      - e) Signature, or
      - f) ID Bracelet, or
      - g) Hospital ID card, or
      - h) Military ID card.

Encl 2

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- 3. Person administering dose verify details of administration:
  - a) Radiopharmaceutical
  - b) Dose
  - c) Route of Administration
- 4. Encourage worker to ask questions.
- 5. User or supervised person date and sign/initial written record (chart).

\*\*See enclosure Radiopharmaceutical Administration Checklist\*\*

#### III. Annual Review

- 6. At least annually the QMP review will consist of:
  - a) Random Sample of therapies representative of the following patient administrations:

| Lot size | Sample size | Acceptance<br>No. |
|----------|-------------|-------------------|
| 20       | ALL         | 0                 |
| 21 - 100 | 20          | 0                 |
| >100     | 20%         | 0                 |

b) All misadministration

c) All recordable events.

For each patient case, compare administered vs. prescribed for

- a) Written directive complete
- b) Patient identity verified
- c) Radiopharmaceutical
- d) Dose
- e) Route of administration

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COL, MC CHIEF, NUCLEAR MEDICINE SERVICE

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#### RADIOPHARMACEUTICAL ADMINISTRATION CHECKLIST

(To be filled out by individuals administering a therapeutic dosage of any radiopharmaceutical other than sodium iodine I-125 or I-131 (SR-89 MIBG, NP-59, P-32), or any dosage greater than 30 microcuries of sodium iodide I-125 or I-131).

PLACE RADIOPHARMACEUTICAL STICKER HERE

DIRECTIONS: Complete the items below in the order listed, and initial each item when completed. If you do not fully understand how to carry out the written directive (PRESCRIPTION/CONSENT FORM) for this administration, halt the procedure and contact the Chief, Nuclear Medicine Service, or other authorized user immediately.

(what?)

#### PART I - BEFORE ADMINISTRATION

Attach a copy of the written directive (PRESCRIPTION/CONSENT FORM) for the dosage prepared. The written directive (PRESCRIPTION/CONSENT FORM) is signed and dated by an authorized user. The patient's identity checked verbally and confirmed as the individual named in the written directive (PRESCRIPTION/CONSENT FORM) by comparison with corresponding information in the patient's record using at least one of the following means of identification. (Listed in order of preference. Check applicable means.)

Military ID card
 Name on the patient's ID bracelet
 Drivers license photo
 Other (SSAN Birth date Address Signature)

The radiopharmaceutical to be administered is the same as that identified on the written directive (PRESCRIPTION/CONSENT FORM).

Route of administration (circle): I.V. I.M. P.O. Other

The dosage to be administered is the same as that identified on the written directive (PRESCRIPTION/CONSENT FORM).

Laboratory test results (Beta BCG, TSH, CBC, etc) have been reviewed.

#### PART II - AFTER ADMINISTRATION

Date and time of dose administration:

DATE TIME

Record, date, and initial the administered dosage on the patients's consult, and place in the Nuclear Medicine Folder.

REVIEWED BY (AUTHORIZED USER):

SIGNATURE

DATE

initials

initials

initials

initials

# **QUALITY MANAGEMENT PROGRAM - BRACHYTHERAPY**

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The following is an extract from Chapter 3, the Radiation Oncology Service Policy and Procedure Manual, Walter Reed Army Medical Center.

3.2.7.11 Quality Management Program for WRAMC Radioactive Material Permit Program. The NRC has amended Part 35 of its regulations governing the therapeutic administration of radiation and radioactive material covered by the hospital's WRAMC Radioactive Materials Permit. A complete copy of the affected changes is located in Federal Register, Volume 56, Number 143, of 25 July 1991, pages 34120-34122. These changes affect brachytherapy procedures with Radiation Oncology. The changes effected are summarized here:

- 1. Definitions. In radiation oncology, MISADMINISTRATION means the administration of a brachytherapy radiation dose:
  - a. Involving the wrong patient, wrong radioisotope, or wrong treatment site (excluding, for permanent implants, seeds that were implanted in the correct site but migrated outside the treatment site);
  - b. Involving a sealed source that is leaking;
  - c. When for a temporary implant, one or more sealed sources are not removed upon completion of the procedure; or
  - d. When the calculated administered dose differs from the prescribed dose by more than 20 percent of the prescribed dose.

**RECORDABLE EVENT** means the administration of:

- a. Radiation without a written directive (see definition below) where a written directive is required;
- b. A brachytherapy radiation dose when the calculated administered dose differs from the prescribed dose by more than 10 percent of the prescribed dose.

Encl 3

Extract of the Quality Management Program for Brachytherapy, Chapter 3, Policy & Procedure Manual, Radiation Oncology, WRAMC, September 1993

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WRITTEN DIRECTIVE means an order in writing for a specific patient, dated and signed by an authorized user prior to the administration of radiation, containing the following information:

- a. For high-dose-rate remote afterloading brachytherapy: the radioisotope, treatment site, and total dose; or
- b. For all other brachytherapy:

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- (1) Prior to implantation: the radioisotope, number of sources, and source strengths; and
- (2) After implantation but prior to completion of the procedure: the radioisotope, treatment site, and total source strength and exposure time (or, equivalently, the total dose).

ORAL DIRECTIVES AND REVISIONS TO WRITTEN DIRECTIVES: A footnote to 10 CFR 35.32(a)(1) reads as follows:

"If, because of the patient's medical condition, a delay in order to provide a written directive would jeopardize the patient's health, an oral revision to an existing written directive will be acceptable, provided that the oral revision is documented immediately in the patient's record and a revised written directive is dated and signed by the authorized user within 48 hours of the oral directive.

Also, a written revision to an existing written directive may be made for any diagnostic or therapeutic procedure provided that the revision is dated and signed by an authorized user prior to the administration of the radiopharmaceutical dosage, the brachytherapy dose, the gamma stereotactic radiosurgery dose, the teletherapy dose or the next teletherapy fractional dose. Extract of the Quality Management Program for Brachytherapy, Chapter 3, Policy & Procedure Manual, Radiation Oncology, WRAMC, September 1993

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If, because of the emergent nature of the patient's medical condition, a delay in order to provide a written directive would jeopardize the patient's health and oral directive will be acceptable, provided that the information contained in the oral directive is documented immediately in the patient's record and a written directive is prepared within 24 hours of the oral directive."

3.2.7.12 QUALITY MANAGEMENT PROGRAM. Major aspects of the Brachytherapy Quality Management Program a WRAMC includes:

- a. A written directive is required for and must be written prior to any brachytherapy radiation dose.
- b. Prior to each administration the patient's identity must be verified by more than one method as the individual named in the written directive.
- c. All workers must seek guidance if they do not understand how to carry out the written directive.
- d. Final plans of treatment and related calculations for brachytherapy must be in accordance with the respective written directive.
- e. Each administration must be in accordance with the written directive.
- f. For temporary and permanent implants radiographs or other comparable images (e.g. CT) of the brachytherapy radioactive sources (or dummies) shall be obtained for verifying the position of the sources and calculation of dose. This may not be necessary for fixed geometry applicators (e.g., templates).

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Extract of the Quality Management Program for Brachytherapy, Chapter 3, Policy & Procedure Manual, Radiation Oncology, WRAMC, September 1993

g. The authorized user will promptly record in the patient's chart the actual loading sequence of the radioactive sources implanted.

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- h. After insertion of the brachytherapy sources but prior to completion of the procedure, the authorized user will enter in the patient's record the radioisotope, treatment site, and total source strength and exposure time (or, equivalently, the total dose).
- i. Within 24-hours of the implant or before the total prescribed brachytherapy dose has been administered, computer and manual calculation shall be checked.
- j. Any unintended deviation from the written directive must be identified and evaluated as a recordable event or misadministration. An investigation and evaluation with the division is required and recommendations for corrective action will be implemented. Appropriate action must be taken. A summary of evaluation will be presented to the quarterly meeting of the Radiation Control Committee. A copy of the evaluation of recordable events will be sent within thirty days to Health Services Command.
- k. A review of the quality management program must be conducted at intervals no greater than 12 months.

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## NEIX

# QUALITY MANAGEMENT (QM) PROGRAM CHECKLIST

| •        |                                                                                                      |                                                       |
|----------|------------------------------------------------------------------------------------------------------|-------------------------------------------------------|
| 1. N     | IAME OF LICENSEE Department 41. Bring                                                                | /mars Rolling Nation get                              |
| Da       | ate QM Plan submitted to NRC                                                                         | Reviewer's Notes:                                     |
| *Li      | icense No.: 08 - 01713                                                                               |                                                       |
| ۲D       | Docket No.: $(7i)$                                                                                   | Strinte in Cas                                        |
| Te       | elephone No.: ()                                                                                     |                                                       |
| ԼԼ       | NL Authorization Reviewer#_16                                                                        | Search Dear with                                      |
| Re       | eviewer# <u>T</u> Reviewer Loc (UCSF or other)                                                       | direction and activity of the Used                    |
| 2n       | nd Reviewer# <u>54</u> Reviewer Loc (UCSF or other)                                                  | SF NO DAND IN St 91                                   |
| LL       | ŃL Reviewer#                                                                                         | - W competence                                        |
|          |                                                                                                      |                                                       |
|          |                                                                                                      |                                                       |
|          |                                                                                                      | Reviewers: Cross out comments which are no longer     |
|          |                                                                                                      | vill not be stored in database. These are comments to |
|          | i.                                                                                                   | the tracking office.                                  |
| *R       | ISO IT & CARLES SAN AND AND                                                                          | (include title e.g. Dr. Mr. Ms. etc.                  |
| . *D     | epartment                                                                                            | (e.g., Nuclear Med., Radiation Oncology, etc.         |
| *SI      | treet or P.O. Box W/Ash - Alca                                                                       |                                                       |
| *Ci      | ity Warkingdon State                                                                                 |                                                       |
| Revie    | ewer: Take this information from <u>license</u> only.                                                |                                                       |
| _        |                                                                                                      |                                                       |
| 2a.      | . Authorized user for Teletherapy (35.600)                                                           | IYES QINO IU                                          |
| 2b.      | . Authorized user for Gamma Stereotactic Radiosur                                                    | gery QYES 🗖 NO QU                                     |
| 2c.      | Authorized user for High-Dose-Rate Remote                                                            |                                                       |
|          | Afterloading Brachytherapy (HDR)                                                                     | TYES AND U                                            |
| 2d.      | . Authorized user for Brachytherapy (35.400)                                                         | WYES INO U                                            |
| 2e.      | . Authorized user for I-125 and/or I-131> 30 uCi                                                     |                                                       |
|          | Any or all of 35.100, 35.200, 35.300, unless both I-125 and I-131 a included in section 6 of license | re excluded or not                                    |
| 2f.      | Authorized user for Radiopharmaceutical Therapy                                                      | other than I-125                                      |
|          | and/or I-131 (35.300)                                                                                |                                                       |
|          | Υ.                                                                                                   |                                                       |
| Re       | viewer: U means that the licensee is authorized f                                                    | or this modality                                      |
| ر).<br>ا | but has stated in a letter that the facility w<br>this modality in practice                          | vill not be using                                     |
|          |                                                                                                      |                                                       |

Revised 1st Page 1.1

|      |                                                            |                                                                                                      |                                                                                                                                             |                                                          |                                                                                                                               | F                                                               |                           |                         |                 |                         |
|------|------------------------------------------------------------|------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|---------------------------|-------------------------|-----------------|-------------------------|
| • •  | Qı                                                         | uality                                                                                               | Managem                                                                                                                                     | ent                                                      | Program                                                                                                                       | for                                                             | Bra                       | achýt                   | thera           | ару                     |
| 57.  | A w                                                        | ritten QM                                                                                            | [P for Brachyther:                                                                                                                          | apy w                                                    | as provided.                                                                                                                  |                                                                 |                           | _ YES                   | 5 <u>X</u> no   | ) (3d)                  |
|      | A wri<br>requir<br>progra                                  | tten QMP mu<br>red in 10 CFF<br>am                                                                   | ist be established and m<br>35.32(f)(1). Please pro                                                                                         | aintaine<br>vide yoi                                     | d for each Brachyther<br>ur QMP for your Brac                                                                                 | apy use as<br>hytherapy                                         | 3<br>/                    |                         |                 |                         |
| 58.  | Writ                                                       | ten certif                                                                                           | ication that QM j                                                                                                                           | progra                                                   | am has been im                                                                                                                | plemer                                                          | ited                      | _ YES                   |                 | ) (4 <b>)</b>           |
|      | Each<br>QMP 1<br>35.32(1                                   | applicable Pa<br>has been impl<br>f)(2). Please p                                                    | ert 35 licensee is require<br>emented long with a co<br>provide written certificat                                                          | d to sub<br>py of the<br>tion that                       | omit a written certifica<br>eir plan, pursuant to 1<br>; your QMP has been i                                                  | ation that<br>0 CFR<br>mplemen                                  | their<br>ted.             |                         | ·               |                         |
|      | <u>OBJEC</u>                                               | <u>TIVE 1 - </u>                                                                                     | WRITTEN DIREG                                                                                                                               | CTIVI                                                    | E [10 CFR 35.32(a                                                                                                             | <u>ı)(1)]</u>                                                   |                           |                         |                 |                         |
| 59a. | A wi<br>high                                               | ritten dire<br>-dose-rate                                                                            | ective is prepared                                                                                                                          | for B                                                    | rachytherapy, o                                                                                                               | ther tha                                                        | an                        | _ YES                   | KNC             | ) (11)                  |
|      | 10 CFF<br>prepar<br>The wi<br>author<br>must in<br>each pa | R 35.32(a)(1) r<br>ration of writt<br>ritten directiv<br>ized user or p<br>nclude a writt<br>atient. | requires that QMPs for t<br>een directives prior to ac<br>e must be an order for a<br>physician under the sup<br>ten policy that requires t | brachyth<br>dministr<br>specific<br>ervision<br>that suc | nerapy include a proc<br>ration of any brachyth<br>patient, dated and sig<br>of an authorized user<br>h a written directive b | edure for<br>herapy dos<br>ned by an<br>r. Your Qi<br>e prepare | the<br>sé.<br>MP<br>d for |                         |                 |                         |
|      | The G<br>direc                                             | QMP prov<br>tive inclu                                                                               | vides procedures<br>de:                                                                                                                     | to req                                                   | uire that the w                                                                                                               | ritten                                                          |                           | (12)                    | 1               |                         |
|      | 59b.<br>59c.                                               | Order fo<br>Dated a                                                                                  | or a specific patier<br>nd signed by auth                                                                                                   | nt<br>Norized                                            | d user                                                                                                                        | •••••                                                           | •••••                     | _ YES                   |                 | (12a)<br>(12b)          |
|      | Prior                                                      | to impla                                                                                             | ntation:                                                                                                                                    |                                                          |                                                                                                                               |                                                                 |                           |                         | <i>;</i>        | (12c)                   |
|      | 59d.<br>59e.<br>59f <i>.</i>                               | the radi<br>number<br>source s                                                                       | oisotope,<br>of sources,<br>trengths;                                                                                                       |                                                          |                                                                                                                               |                                                                 |                           | _ YES<br>_ YES<br>_ YES |                 | (12d)<br>(12e)<br>(12f) |
|      | After                                                      | implanta                                                                                             | tion, but prior to                                                                                                                          | comp                                                     | pletion of the pr                                                                                                             | ocedur                                                          | e:                        |                         |                 | (12g)                   |
|      | 59g.<br>59h.<br>59i                                        | the radio<br>treatmen                                                                                | bisotope,<br>t site,                                                                                                                        |                                                          | sure time (or                                                                                                                 |                                                                 | ·····i<br>· · · · · ·     | _ YES<br>_ YES          | X no<br>Xno     | (12h)<br>(12i)          |
|      |                                                            | equivale                                                                                             | ntly, the total dos                                                                                                                         | se)                                                      | Sure unie (01,                                                                                                                |                                                                 |                           | YES                     | <sup>∨</sup> NO | (12j)                   |

í

Brachytherapy

|      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | ĺ               |
|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| .87. | Review includes an evaluation of acceptable representative sample of all patient administrations, all recordable events, and misadministrations.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | _ YES' NO (37)  |
|      | Your QMP review does not provide an evaluation of (i) an adequate representative<br>sample of patient administrations (ii) all recordable events, and (iii) all<br>misadministrations since the last review as required in 10 CFR 35.32(b)(1). The number<br>of patient cases to be sampled should be based on the principles of statistical acceptance<br>sampling and should represent each modality performed in the institution (e.g.,<br>radiopharmaceutical, teletherapy, brachytherapy, and gamma stereotactic radiosurgery)<br>You may develop a sampling procedure of your own; use the chart provided in 10 CFR<br>32.110 (assuming an error rate of 2 percent); or a representative sample may be selected<br>including (at a minimum): 20% if the number of cases performed is greater than 100, 20<br>cases if the number of cases is between 20 and 100, and all, if the number of cases is less<br>than 20.) Provide a copy of your revised QMP to include this provision. | ·<br>·          |
| 88   | Includes procedure to expand review if recordable events or                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | VES NO (38)     |
|      | misadministration is uncovered during the periodic review of your OMP.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                 |
|      | According to guidance provided by Regulatory Guide 8.33, your QMP must include a procedure to expand the number of cases reviewed when a misadministration or recordable event is uncovered during the periodic review of your QMP. Please include such a provision in your QMP.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                 |
| 89.  | Procedures for determining the effectiveness of the OM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | YES NO (39)     |
|      | program and, if necessary, making modifications to meet the                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                 |
|      | objectives of the program.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                 |
|      | Describe your procedures to evaluate the effectiveness of the QMP, and, if necessary, to make modifications to meet the objectives of the program as required by 10 CFR 35.32(b)(2).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                 |
| 00   | Madifications to OM program submitted to NIPC within 20                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                 |
| 90.  | days after modification has been made                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | YES _1NO (40)   |
|      | Please provide assurance that modifications to your QMP will be submitted to the NRC within 30 days after the modification has been made as required by 10 CFR 35.32(e).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                 |
| 91.  | Records of each review and evaluation to be maintained for 3 years                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | _ YES _ NO (41) |
|      | Please provide assurance that records of each review and evaluation will be maintained for three years as required in 10 CFR 35.32 (b)(3).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                 |
|      | AENTE. No red 121                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | an submitted    |

Quality Management Program for Therapeutic Radiopharmaceutical other than I-125 or I-131 A written QMP for Therapeutic Radiopharmaceutical other YES 📉 NO (3f) 92. than I-125 or I-131 was provided. A written QMP must be established and maintained for Radiopharmaceutical use as required in 10 CFR 35.32(f)(1). Please submit your QMP for your Radiopharmaceutical therapy. YES \_ NO (4) 93. Written certification that QM program has been implemented Each applicable Part 35 licensee is required to submit a written certification that their QMP has been implemented along with a copy of their plan, pursuant to 10 CFR 35.32.f)(2). Please provide written certification that your QMP has been implemented. OBJECTIVE 1 - WRITTEN DIRECTIVE [10 CFR 35.32(a)(1)] YES NO (9) A written directive is prepared for administration of 94a. therapeutic radiopharmaceutical other than I-125 and/or I-131 10 CFR 35.32(a)(1) requires a QMP to include policies and procedures for the preparation of a written directive, prior to the administration of any therapeutic iadiopharmaceutical, other than sodium iodide I-125 or I-131. Please provide such a policy in your QMP. The QMP provides procedures to require that the written directive include: Radiopharmaceutical..... YES 94b. NO (10a) 94c. YES NO (10b) Dosage..... Route of administration..... 94d. YES NO (10c) YES \_NO (10d) Order for a specific patient..... 94e. 94f. Dated and signed by authorized user..... YES NO (10e) The written directive must be an order for a specific patient, dated and signed by an authorized user or physician under the supervision of an authorized user, and, for a therapeutic use of a radiopharmaceutical other than I-125 or I-131, the radiopharmaceutical, dosage, and route of administration. Your QMP is missing procedures to require that the written directive for therapeutic radiopharmaceutical other than I-125 and/or I-131 include: (a) Radiopharmaceutical (b) Dosage (c) Route of administration (d) Order for a specific patient (e) Date and signed by authorized user

Therapeutic Radiopharmaceutical other than I-125 or I-131

95. Documentation of oral revisions and oral directives: YES ¥ NO (18a) Policies/Procedures for documentation of oral revisions to a. existing written directive signed and dated by an a.u. or physician under the supervision of an a.u. within 48 hours of the oral revision A footnote to 10 CFR 35.32(a)(1) provides that an oral revision to a written directive is acceptable if, because of the patient's condition, a delay in order to provide a written revision to an existing written directive would jeopardize the patient's health. Oral revisions must be documented immediately in the patient's record and a revised written directive must be signed and dated by an authorized user or physician under the supervision of an authorized user within 48 hours of the oral revision. Please include such a policy in your OMP. b. If, a delay in order to provide a written directive would NO (18b) jeopardize the patients health, an oral directive will be acceptable, provided that information is documented immediately in the patient's record and a written directive is prepared within 24 hours of the oral directive. Please include such a provision in your QMP. If, because of the emergent nature of the patient's condition, a delay in order to provide a written directive would jeopardize the patients health, an oral directive will be acceptable, provided that the information provided in the oral directive is documented immediately in the patient's record and a written directive is prepared within 24 hours of the oral directive. 96. Revisions to written directives dated and signed by a.u. prior to \_ YES \_NO (19) administration of a radiopharmaceutical dosage Revisions to written directives may be made for any diagnostic or therapeutic procedure provided that the revision is dated and signed by an authorized user prior to the administration of the radiopharmaceutical dosage. Your QMP must include a policy/procedure that requires that revisions to written directives will be made prior to administration. **OBJECTIVE 2 - PATIENT IDENTITY VERIFICATION [10 CFR 35.32 (a)(2)]** YES NO (23f) 97. Procedure to verify patient's identity by more than one method prior to administration Procedures to verify the patient's identity by more than one method prior to administration, as required by 10 CFR 35.32(a)(2) have not been adequately addressed in your QMP. Your QMP must include a policy/procedure to require that, prior to each Therapeutic Radiopharmaceutical other than 1-125 or I-131 administration, the patient's identity will be verified by more than one method as the individual named in the written directive as required by 10 CFR 35.32(a)(2).

## OBJECTIVE 3 - TREATMENT PLANS VERIFICATION (NOT APPLICABLE TO RADIOPHARMACEUTICAL THERAPY)

December 6, 1993

-30-

Therapeutic Radiopharmaceutical other than I-125 or I-131

# OBJECTIVE 4 - VERIFICATION PRIOR TO ADMINISTRATION TO WRITTEN DIRECTIVE [10 CFR 35.32(a)(4)]

YES NO (27c) Procedures to ensure, before administration, that each 98a. administration is in accordance with the written directive. Your submittal for administration of therapeutic radiopharmaceutical other than I-125 or I-131 does not include policies/procedures that ensure that each administration is in accordance with the written directive as required by 10 CFR 35.32(a)(4). Describe your policy/procedure to verify, before administering the byproduct material, that the specific details of the administration are in accordance with the written directive. 98b. Confirm the radiopharmaceutical, dosage and route of administration Y YES \_ NO (27d) Dosage measured in dose calibrator and results compared with the prescribed dosage in the written directive According to guidance provided by Regulatory Guide 8.33, the radiopharmaceutical, dosage, and route of administration should be confirmed by the person administering the radiopharmaceutical to verify agreement with the written directive, that is, the dosage should be measured in the dose calibrator and the results compared with the prescribed dosage in the written directive. Please provide such (or similar) procedures in your QMP. 99. Commitment for all workers to seek guidance if they do not understand how to carry out the written directive Your QMP must include a policy for instruction of all workers to seek guidance if they do not understand how to carry out the written directive. Please include such a provision in your QMP. YES 100. A written directive and records of each administered Therapeutic Radiopharmaceutical other than I-125 or I-131 must be maintained for three years. A commitment to retain each written directive and a record of each administered radiopharmaceutical dosage for three years after the date of administration is required in 10 CFR 35.32(d)(2). Describe the procedure for an authorized user or a qualified individual under the supervision of an authorized user (e.g., a nuclear medicine physician, physicist, or technologist), after administering a radiopharmaceutical, to make, date, sign or initial a written record that documents the administered dosage in an auditable form. **OBJECTIVE 5 - UNINTENDED DEVIATIONS [10 CFR** 101. Policies/Procedures for identification and evaluation of NO (34f) unintended deviations from the written directive Your QMP for Therapeutic Radiopharmaceutical other than I-125 or I-131 must include policies/procedures to identify and evaluate any unintended deviations from a written directive and to institute corrective actions to be taken after the deviation has been identified as required by 10 CFR 35.32(a)(5). Please include such a provision in vour OMP. 102a. Institution of corrective actions to be taken after the deviation has been identified Your QMP must include policies/procedures to institute corrective actions to be taken after an unintended deviation has been identified

December 6, 1993

Therapeutic Radiopharmaceutical other than I-125 or I-131
## EVALUATION AND RESPONSE TO RECORDABLE EVENTS [10 CFR 35.32(c)]

102b. Commitment for evaluation and response to each recordable event by: (i) assembling the relevant facts including the cause; (ii) identifying what, if any, corrective action is required to prevent recurrence; and (iii) retaining a record, in an auditable form, for three years, of the relevant facts and what corrective action was taken.

As required in 10 CFR35.32(c), the licensee shall evaluate and respond, within 30 days after discovery of the recordable event, to each recordable event by:(i) assembling the relevant facts including the cause; (ii) identifying what, if any, corrective action is required to prevent recurrence; and (iii) retaining a record, in an auditable form, for three years, of the relevant facts and what corrective action was taken.

## PERIODIC REVIEWS OF THE OM PROGRAM [10 CFR 35.32(b)]

103. Time intervals (intervals not to exceed 12 months)

Your submittal for Therapeutic Radiopharmaceutical other than I-125 or I-131 does not provide adequate procedures to conduct periodic reviews of your QMP as required by 10 CFR 35.32(b). You must include the time intervals for your reviews. These reviews should be conducted at intervals no greater than 12 months.

104. Review includes an evaluation of acceptable representative sample of all patient administrations, all recordable events, and misadministrations

Your QMP review does not provide an evaluation of (i) an adequate representative sample of patient administrations (ii) all recordable events, and (iii) all misadministrations since the last review as required in 10 CFR 35.32(b)(1). The number of patient cases to be sampled should be based on the principles of statistical acceptance sampling and should represent each modality performed in the institution (e.g., radiopharmaceutical, teletherapy, brachytherapy, and gamma stereotactic radiosurgery). You may develop a sampling procedure of your own; use the chart provided in 10 CFR 32.110 (assuming an error rate of 2 percent); or a representative sample may be selected including (at a minimum): 20% if the number of cases performed is greater than 100, 20 cases if the number of cases is between 20 and 100, and all, if the number of cases is less than 20.) Provide a copy of your revised QMP to include this provision.

105. Includes procedure to expand review if recordable events or misadministration is uncovered during the periodic review of your QMP.

According to guidance provided by Regulatory Guide 8.33, your QMP should include a procedure to expand the number of cases reviewed when a misadministration or recordable event is uncovered during the periodic review of your QMP. Please include such a provision in your QMP.

106. Procedures for determining the effectiveness of the QM program and, if necessary, making modifications to meet the objectives of the program

Describe your procedures to evaluate the effectiveness of the QMP, and, if necessary, to make modifications to meet the objectives of the program as required by 10 CFR 35.32(b)(2).

YES 🔧 NO (39)

-YES  $\times$  NO (38)

VES NO (37)

YES V NO (36f)

NO (1)

December 6, 1993

-32-

Therapeutic Radiopharmaceutical other than I-125 or I-131

107. Modifications to QM program submitted to NRC within 30 days after modification has been made

Please provide assurance that modifications to your QMP will be submitted to the NRC within 30 days after the modification has been made as required by 10 CFR 35.32 (e)

108. Records of each review and evaluation to be maintained for 3 years

Please provide assurance that records of each review and evaluation will be maintained for three years as required in 10 CFR 35.32 (b)(3).

COMMENTS:\_

No real plan fire

YES (\_ NO (40)

YES \_\_ NO (41)

# Therapeutic Radiopharmaceutical other than I-125 or I-131



DEPARTMENT OF THE ARMY WALTER REED ARMY MEDICAL CENTER WASHINGTON, D.C. 20307-5001

January 10, 1992



REPLY TO ATTENTION OF:

Nuclear Medicine Service

030-01317 08-01738-02

United States Nuclear Regulatory Commission Region I 475 Allendale Road King of Prussia, Pennsylvania 19406

Gentlemen:

Pursuant to Title 10, Chapter 1, Code of Federal Regulations, Part 35, Section 35.32(f)(2), we provide you with written certification that a Quality Management Program, or continuous Quality Improvement (CQI) Plan, is implemented at Walter Reed Army Medical Center.

Referenced in paragraph 1 of the CQI are the written policies and procedures which make up the plan (Enclosure). Also enclosed is a copy of the Nuclear Medicine Service Pharmacy Standing Operating Procedures (SOP) which contain the specific objectives as established in 10 CFR 35.

Sincerely Roy D. Quick, Jr.

Koy D. Quick, Jr: Major, U.S. Army Executive Officer

Enclosures

RSD HP Office 2681 findentine Sitver spring

## CONTINOUS QUALITY IMPROVEMENT (CQI) PLAN (REV, 03/01/92)

## 1. References:

a. AR-40-66

b. WRAMC REG 40-60

c. WRAMC REG 40-92

d. JCAH MANUAL

e. JCAH QUALITY REVIEW BULLETIN, SEP 1986

f. OA PLAN, DEPT OF RADIOLOGY 1990

g. WRAMC NUCLEAR MEDICINE SERVICE PHARMACY SOP

h. U.S. NRC REGULATORY GUIDE 10.8, AUGUST 1987 (rev 2)

I. WRAMC NUCLEAR MEDICINE IMAGING SOP

2. Responsibility: Colonel Jay H. Anderson, MC, Chief, Nuclear Medicine Service has been appointed the Quality Assurance Officer for the Nuclear Medicine Service. He shall be responsible for coordinating all monitoring and evaluation of the quality and appropriateness of care in the Nuclear Medicine Service.

3. Scope: The Nuclear Medicine Service provides diagnostic nuclear medicine procedures, both imaging and non-imaging, for in-patients and out-patients, interprets these studies and performs radionuclide therapy in accordance with appropriate standards of practice and governing regulations.

4. Important Aspects of Care:

(A). Assessing patient condition to determine special needs for supervision.

(B). Assessing risk factors in the following patient population:

(1). Patients with fractures or limitation of motion.

- (2). Cardiac patients being tested by stress testing.
- (3). Pediatric patients.
- (4). Women during childbearing years.
- (5). Senile patients.
- (6). Disoriented or comatose patients.

(C). Staff performance during procedures:

- (1). Radiopharmaceutical dose preparation.
- (2). Administering radiopharmaceuticals.
- (3). Patient imaging
- (4). Computer analysis of studies.
- (5). Providing patient with specific instructions as to the risks, benefits and side affects of specific treatments.
- (6). Alievating patients fears about radioactivity.

- 5. Indicators: See attached appendix A.
- 6. Criteria: See attached appendix A.
- 7. Data Collection: See attached appendix A.
- 8. Problem Solving:

. .....

- a. A monthly Nuclear Medicine Service CQI meeting will address ongoing indicators and identify new problems, which if validated will be entered into the tracking system.
- b. Based on the nature of the problem, an individual or a group of individuals will be given responsibility to investigate the problem and recommend corrective action where necessary.

9. Reports: The minutes of the Nuclear Medicine Service CQI Committee will be forwarded to the CQI committee of the Dept of Radiology. A copy will be maintained by the NMS.

10. The CQI coordinator will be responsible for an annual review and update of the Total Quality Management plan (January), including the monthly Peer Review, and CQI minutes. The CQI Plan incorporates the reccomendations published in the Federal Register (10CFR 35.32) on July 25 1991. Specific issues are addressed in the references cited at the top of this document.

11. The Nuclear Medicine Parmacist will be responsible for maintaining optimal radiopharmacy practices, and will provide an annual review of the NMS SOP to include quality control and radiation safety which will be updated and modified to comply with federal regulations.

12. The Technical Director and the Imaging Supervisor will be responsible for an annual review and update of the Imaging SOP, monthly technologist peer review, and supervising the instrument quality control on a daily basis. A consulting physicist will review these procedures at least bi-annually.

13. The RIA Supervisory Technologist is responsible for maintainance of optimal practices and an annual review of the SOP.

14.Confidentiality: All Quality Assurance activities, all committee members and all personnel engaged in the Quality Assurance program will be bound by the confidentiality Policy.

15. Reports, minutes, and other findings may not be released to or discussed with any person or agency except those mandated by Chief, Nuclear Medicine Service. These activities may be reviewed by JCAHO or any professional surveyor for the purpose of accreditation. Such professional accreditation review will be the sole

exception to the confidentality policy.

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Jay H/ Anderson COL, MC Chief, Nuclear Medicine Service

# DEPARTMENT OF RADIOLOGY -- NUCLEAR MEDICINE SERVICE ON-GOING QUALITY ASSURANCE MONITORING PROGRAM

| INDICATOR                                                                  | CRITERIA                                               | HOW MONITORED                                                                   | WHO MONITORS                           | MONITORING<br>FREQUENCY       | RESULTS                                                                                                         |
|----------------------------------------------------------------------------|--------------------------------------------------------|---------------------------------------------------------------------------------|----------------------------------------|-------------------------------|-----------------------------------------------------------------------------------------------------------------|
| Misadministration of radionuclides                                         | No more than 3 per 12<br>months (< 3 / 10000)          | Review of each<br>administration by<br>Health Physics Office                    | Radiopharmacist                        | Semiannually<br>(Feb and Oct) | No misadministsrations<br>indetified during the<br>past 12 months                                               |
| Patient Waiting Times<br>(appointment delays)                              | 3 days inpatient<br>3 weeks outpatients                | Weekly review of<br>scheduling times                                            | Receptionist and QA<br>Coordinator     | Semiannually<br>(Mar and Sep) |                                                                                                                 |
| Patient satisfaction                                                       | < 5% dissatisfied                                      | Review of patient survey questionaries                                          | NM QA Coordinator<br>and service chief | Semiannually<br>(Mar and Sep) |                                                                                                                 |
| Pathologic confirmation<br>of thyroid malignancy<br>prior to 131-I therapy | < 2 per year<br>(2 / 10 to 12                          |                                                                                 | NM Staff physicians                    | Annually                      |                                                                                                                 |
| Monthly case (peer<br>review) results                                      | < 5% overall<br>disagreement on an<br>annualized basis | Independent monthly<br>case review by all NM<br>staff physicians and<br>fellows | Assistant Chief, NM<br>service         | Annually (Jun)                | Less than 1 case per 2<br>weeks (< 1/200)<br>All identified reporting<br>discrepencies corrected<br>immediately |
| Weekly case<br>conference                                                  | No reporting<br>discrepencies                          | Joint weekly case<br>review by NM staff<br>physicians and fellows               | NM Fellows and service chief           | Monthly                       |                                                                                                                 |
| Instrument Down Time                                                       | Being Established                                      | Monthly log                                                                     | Tech Supervisor                        | Monthly                       |                                                                                                                 |
| Infiltrated Doses which require reinjection                                | < 1%                                                   | Pharmacy log                                                                    | Radiopharmacy                          | Semiannually                  |                                                                                                                 |
|                                                                            | ·                                                      |                                                                                 |                                        |                               |                                                                                                                 |

WRAMC Nuclear Medicine Service -- CQI Plan -- Appendix A 3 January, 1992

# <u>INTENT</u>

# THE INTENT OF THIS SOP IS TO PROVIDE GUIDANCE FOR THE OF THE NUCLEAR PHARMACY

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OPERATION

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SECTION I.

## NUCLEAR PHARMACY SOP

## TABLE OF CONTENTS

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## NUCLEAR PHARMACY SOP

1. <u>PURPOSE:</u> The purpose of this SOP is to describe the procurement, compounding, quality control, and dispensing of radiopharmaceuticals to include investigational new agents.

## 2. FUNCTIONS OF NUCLEAR PHARMACIST:

a. Assure safety, effectiveness and correctness of radioactive drugs used in patients at WRAMC through biological, chemical, physical, and radiological testing and radioactive drug use surveillance.

b. Assists in clinical and laboratory investigations using radioactive drugs through consultation, drug formulation and safety testing, assisting principal investigators with the preparation of research protocols, and INDs and carrying out the portion of the Pharmacy Service's responsibility to the WRAMC investigational drug program that pertains to the use of radioactive drugs in humans.

c. Provides didactic and laboratory instruction and examination in nuclear pharmacy courses and programs in support of nuclear medicine, nuclear medicine technology, radiation health physics, and clinical nuclear pharmacy courses, programs, residencies, and clerkships.

d. Develops and evaluates new radiopharmaceuticals and new radiopharmaceutical compounding and testing procedures and evaluates those developed by other institutions and by manufacturers.

e. Provides nuclear pharmacy services within the WRAMC Nuclear Medicine Services:

(1) Maintains a continuous inventory of the best quality radiopharmaceuticals available at the least practical cost; includes commercial and in-house formulations.

(2) Prepares and dispenses quality control tested radiopharmaceuticals in precalibrated doses ready for patient administration.

Nuclear Pharmacy SOP

5 Mar 1990

HSHN-XN

(3) Orders, receives, assays and stores radioactive drugs IAW WRAMC, DA, and federal regulations.

(4) Maintains prescription, formulation, receipt, inventory, use and disposal records pertaining to approved and investigational radioactive drugs as required by military, federal, and WRAMC rules and regulations.

(5) Monitors and reduces laboratory radiation levels and surveys for and decontaminates spilled radioactive material in cooperation with WRAMC Health Physics Officer.

(6) Instructs Nuclear Medicine Service personnel in laboratory techniques for safe handling of radioactive materials.

(7) Conducts Nuclear Pharmacy laboratory training for nuclear medicine technologists and nuclear medicine residents.

## 3. <u>QUALIFICATIONS AND DUTIES OF NUCLEAR PHARMACIST</u>: F

a. The nuclear pharmacist should be certified by the American Pharmaceutical Association, Board of Pharmaceutical Specialties as a Nuclear Pharmacist. As a minimum the radiopharmacist will be a registered pharmacist with training and experience in nuclear pharmacy, nuclear medical science, and radiation health physics.

b. Serves as a member of the WRAMC Radiation Control Committee.

c. Has operational control of nuclear medicine technologists and technicians working in the Nuclear Pharmacy laboratory.

d. Supervises radiation safety procedures, laboratory, and personnel radiation monitoring, radioactive waste handling and related health physics operations within the nuclear pharmacy in close cooperation with the WRAMC Health Physics officer.

e. Coordinates storage, preparation, use, disposal and records-keeping for human use, radioactive, investigational new drugs, with the Pharmacy Service, Nuclear Medicine Service, and Dept of Clinical Investigations.

18 Jul 1991

HSHN-XN

SOP RP # 1

#### MANDATORY WORK RULES

1. Disposable gloves and lab coats will be worn as protective garments when working with radioactive materials.

2. Technetium-99m radiopharmaceutical solutions will be tested by radiochromatography and pH before dispensing individual doses.

3. Doses of radiopharmaceuticals will be within 10% of the prescribed radioactivity at the time of administration to patients.

4. All student prepared doses of radiopharmaceuticals will be checked for correctness by a staff member prior to dispensing. The staff member who checks a dose prepared by a student will initial the consultation and dose label. The staff member must observe the student while the dose is being prepared or the student must leave out for inspection all vials and paraphernalia needed to prepare the dose.

5. Records will be completed and doses of radiopharmaceuticals will be prepared and available for administration to patients by 0730 daily, when appropriate.

6. All appropriate labeling and record entries will be completed before workers leave the radiopharmaceutical laboratory area.

7. All radiopharmaceutical doses will have a dose label attached to the syringe for parenteral doses or dispensing vial for oral doses.

8. Work areas will be surveyed at close of business daily with an appropriate portable radiation detection instrument. Results will be recorded in the record book designated for this purpose.

9. Syringe and vial shields will be utilized for the preparation of radiopharmaceutical vials. Syringe shields will be utilized for administration of doses to patients except in circumstances where their use would compromise the patient's well being.

10. Workers will insure that radioactive materials are either secured or under supervision of clinic personnel at all times, and that non-clinic personnel are accompanied whenever they venture into controlled areas.

11. The clinic will be locked after duty hours.

Nuclear Pharmacy SOP

## 18 Jul 1991

12. For each dose prepared, review the consultation sheet and radiopharmacy order to insure that you understand it. Select the one correct radiopharmaceutical from the storage area and place it in the work area. Read the label. Prepare the dose consistent with the activity required for the study. Read the label. Replace the vial back into the storage area. Read the label. One and only one radiopharmaceutical will be in the work area at a time.

## Nuclear Pharmacy SOP

5 Mar 1990

#### SOP RP # 2

## PREPARING TECHNETIUM-99m RADIOPHARMACEUTICALS

1. Technetium-99m radiopharmaceuticals are prepared according to the directions given in WRAMC Nuclear Pharmacy Formula Record Worksheets.

2. Quality control tests will be initiated before preparing individual precalibrated doses and will be completed before dispensing doses for administration to patients. Radiochemical purity of products will comply with guidance given in the current United States Pharmacopeia (U.S.P.). In cases where no U.S.P. guidance exist, doses will not be dispensed if there is more than 10% of the radionuclide in an undesirable radiochemical form.

5 Mar 1990

HSHN-XN

#### SOP RP # 3

## MONITORING AND INITIAL RECORDS KEEPING UPON RECEIPT OF RADIOACTIVE MATERIALS

1. Radiopharmaceuticals intended for use at Walter Reed AMC Nuclear Medicine Service may be received directly from a local centralized nuclear pharmacy during duty hours. They will be monitored, inspected, and wipe tested where appropriate. Radiopharmaceuticals ordered from a manufacturer will be received by Health Physics Office located at Forest Glen Section and subsequently delivered to Nuclear Medicine.

2. Follow the attached receipt procedure for initial log in of radiopharmaceuticals into the radiopharmacy record system.

3. The vial should be placed in the lead container and the radiopharmaceutical stored in the shielded radiopharmaceutical storage area.

4. If the radiopharmaceutical requires refrigeration, it should be placed in the shielded refrigerator designated for radioactive materials.

5. Upon receipt of RIA kits, the type, lot number, date of expiration, and control number will be assigned in the RIA log.

#### Nuclear Pharmacy SOP

5 Mar 1990

SOP RP # 4

#### RECORDS KEEPING

1. The purpose of these records is:

a. A history of each radioactive item received from date of receipt, through use, to final disposition as radioactive waste or as decayed to background radiation level.

b. A record of patients to whom radioactive materials are administered, including lot numbers of component ingredients.

c. A record of doses prescribed on the individual consultation sheet, individual worksheet, or daily batch worksheet.

d. Consent record for use of investigational or therapeutic radioactive drugs in all patients.

e. Record of calibration checks on radiation dose<sup>+</sup>measuring devices.

f. Record of compounding radiolabeling kits.

2. Several records are kept from one Nuclear Regulatory Commission inspection to the next or for three years or longer, as appropriate. These records include:

a. A radiopharmaceutical stock record which documents the lot number, use, and disposition of radiopharmaceuticals and also gives individual radionuclide dose measurements for each dose of radioactive material administered to patients. (Stock Record Sheet)

b. A Nuclear Pharmacy laboratory record which gives a chronological record of radiation dose calibrator checks.

c. Patient consent forms are filed in the nuclear pharmacy.

3. Records of all misadministrations of radiopharmaceuticals shall be preserved until the Nuclear Regulatory Commission authorizes their disposition.

5 Mar 1990

SOP RP # 5

#### RADIATION SAFETY

1. The WRAMC Health Physics Office has principal responsibility for formulating radiation safety procedures and for records keeping for WRAMC. These procedures, which are given in WRAMC Regulation 40-10, must be perused and followed by persons assigned to the Nuclear Pharmacy Service.

2. In addition to the directives and guides in WRAMC Reg 40-10, the following rules will be followed:

a. Latex gloves and lab coats will be worn when handling radioactive materials.

b. Work surfaces will be lined with absorbent paper before handling radioactive materials.

c. After handling radioactive materials, hands and immediate work areas should be checked with a radiation monitor before leaving the radiopharmacy laboratory.

d. All pharmacy personnel will wear a film badge, and a TLD ring when working in the Nuclear Pharmacy laboratory or with radioactive patients.

e. The Nuclear Pharmacy laboratory will be continuously monitored with radiation detectors. Monitoring should reveal improper storage of radioactive material and poor handling techniques of workers.

f. A radiation survey will be conducted in the Nuclear Pharmacy daily at close of business with an appropriate portable radiation detection instrument. Routine surveys of the radiopharmacy and dose room will include the areas indicated on the Health Physics Laboratory Survey Form (WRAMC 708) included as addendum one to this annex.

g. The procedure for handling spills of radioactive materials in the radiopharmacy is outlined in addendum to this SOP.

Nuclear Pharmacy SOP

NUCLEAR MEDICINE SERVICE DEPARTMENT OF RADIOLOGY WALTER REED ARMY MEDICAL CENTER WASHINGTON, D.C. 20307-5001

HSHL-XN1

19 August 1987

#### RADIONUCLIDE ACCIDENT EMERGENCY PROCEDURES

A. <u>Purpose</u>: To define actions to be taken in event of an accident involving radioactive materials.

B. Minor Spills Involving No Radiation Hazard to Personnel:

- 1. Notify all other persons in the room at once.
- 2. Permit only the minimum number of persons necessary to deal with the spill into the area.
- 3. Confine the spill immediately.

Liquid spills:

Don protective gloves Drop absorbent paper on spill

## Dry Materials Contamination:

Don protective gloves Dampen thoroughly, taking care not to spread the contamination

- 4. Notify the Health Physics Office as soon as possible.
- 5. Decontaminate.
- 6. Monitor all persons involved in the spill and cleaning.
- 7. Permit no person to resume work in the area until survey is
- made, and approval of the Health Physics Officer is secured.
  8. Prepare a complete history of the accident and subsequent activity relating thereto for the Health Physics Office.
- C. Major Spills involving Radiation Hazard to Personnel:
  - Notify all persons involved in the spill to vacate the room at once.
  - 2. If the spill is liquid, and the hands are protected, right the contanier.
  - 3. If the spill is on the skin, flush thoroughly.
  - 4. If the spill is on the clothing, discard outer or protective clothing at once.
  - 5. Switch off all fans.
  - 6. Vacate the room.
  - 7. Notify the Health Physics Office as soon as possible.
  - 8. Take immediate steps to decontaminate personnel involved as necessary.
  - 9. Decontaminate the area. (Personnel involved in decontamination must be adequately protected).

5 Mar 1990

## SOP RP # 6

#### QUALITY CONTROL PROCEDURES

1. The purpose of quality control procedures is to insure that the correct radionuclide in the correct radiochemical form is administered in the correct dose of radioactivity.

2. Sterility and nonpyrogenicity, if appropriate, is assured by either the manufacturer or by compounding procedures given in SOP RP #8 (Compounding Radiopharmaceuticals).

The correct radiochemical form for drugs purchased in 3. precalibrated final dose form is assured by the supplier. Spot checks may be done by the Nuclear Pharmacy if the radiochemical form usually has short stability or if the quality control procedures of the supplier are not considered adequate. Quality control tests for radiochemical form of technetium-99m compounds qiven are in SOP RP #2 (Preparing Technetium-99m Radiopharmaceuticals) and in SOP RP #8 (Compounding Radiopharmaceuticals).

4. Highly important quality control and radiation safety procedures are given in SOP RP #1 (Mandatory Work Rules).

5. Quality control tests for dose calibrators are performed IAW NRC Reg Guide 10.8, Appendix C.

6. Quality control tests for in-house compounded radiolabeling kits are described in SOP RP #8 (Compounding Radiopharmaceuticals).

Nuclear Pharmacy SOP

## NUCLEAR MEDICINE QUALITY ASSURANCE PROGRAM

## RADIOPHARMACY

The radiopharmacy receives, performs Q.C. and measurements, and dispenses all radiopharmaceutical doses for the Nuclear Medicine Service.

Ongoing indicators are related to instrumentation, radiation protection, and product quality control as well as dispensing and patient considerations. Special indicators and data searches are developed at the request of Nuc Med Svc QA committee.

| INDICATOR                                                                                                               | THRESHOLD                                                                          | FREQUENCY                                      |
|-------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|------------------------------------------------|
| DOSE CALIBRATOR QC<br>CONSTANCY<br>LINEARITY<br>ACCURACY<br>GEOMETRY                                                    | 1/MONTH<br>C<br>O<br>O                                                             | QUARTERINY<br>ANNUALLY<br>AS NEEDED            |
| RECEIPT OF ISOTOPES                                                                                                     |                                                                                    |                                                |
| MONITOR<br>WIPE TEST                                                                                                    | PER DOT<br>NMT 2006 DPM                                                            | SEMI-ANNUAL                                    |
| PRODUCT QC<br>RADIONUCLIDE<br>RADIOCHEMICAL<br>CHEMICAL                                                                 | < 1% REQUIRE RECOM-<br>POUNDING                                                    | QUARTERLY<br>"                                 |
| PATIENT DOSES                                                                                                           |                                                                                    |                                                |
| MISADMINISTRATION<br>DOCUMENT EACH MISAD<br>RP DOSE TO PREGNANT PT<br>ADVERSE RESPONSE TO RP<br>MEASURED PRIOR TO ADMIN | 0<br>ALL<br>Extreme Conditions<br>< 1 PER 1000<br>ALL                              | ANNUALLY<br><br>                               |
| RADIATION PROTECTION                                                                                                    |                                                                                    |                                                |
| UNTIMELY BIOASSAV<br>ALARA BIOASSAV<br>ALARA DOSIMETRY<br>ROGM MONITOR                                                  | NMT I PER QUARTER<br>NMT I PER YEAR<br>NMT I PER YEAR<br>\$200 CPM - I PER<br>WEEK | QUARTERLY<br>ANNUALLY<br>ANNUALLY<br>GUARTERLY |

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5 Mar 1990

SOP RP # 7

#### RADIATION WASTE MANAGEMENT AND DISPOSAL

1. Records of radiopharmaceuticals transferred to "rad waste" are kept on the radiopharmaceutical stock record sheet.

2. Radioactive waste is separated into two lead-lined containers. One container contains needles, syringes, and other paraphernalia presenting a chemical or bio-hazard to waste handlers. Other radioactive waste is placed in the second container.

3. The waste containers are collected as needed on Wednesday afternoon by Health Physics.

5 Mar 1990

SOP RP # 8

## COMPOUNDING RADIOPHARMACEUTICALS

1. Radiolabeling kits will be compounded by a pharmacist who has satisfied the WRAMC Radiation Control Committee that he is competent to compound radiopharmaceuticals and to handle radioactive materials.

2. A record will be maintained of each lot of radiolabeling kits compounded. The record will show the ingredients and lot numbers, method of compounding and quality control test results.

3. The compounding of radiolabeling kits for investigational new drugs will require submission of a research protocol through the Radiation Control Committee and the Clinical Investigation Committee and final review by the OTSG Human Use Review Board as appropriate. Formulations for radiolabeling kits compounded for clinical use at WRAMC will be reviewed by the Human Use Subcommittee of the RCC with a recommendation to the plenary RCC.

4. Quality control procedures may include, as appropriate, testing for radionuclidic purity by spectrum analysis, radiochemical purity by radiochromatography, sterility and nonpyrogenicity by U.S.P. designated tests, particle size by microscopic examination, and pH by pH meter or pH paper.

#### Product: Tc-99m DMSA (Succimer Kit) by MPI May 1988

## KIT PREPARATION INSTRUCTIONS

1. Latex gloves should be worn during this preparation.

2. Hold the ampule of DMSA reagent in one hand and open it by applying pressure above the score line on the narrow part of the neck of the ampule.

3. Pull up 2 ml. of DMSA and inject into the shielded mixing vial and withdraw an equal volume of air.

4. Calculate the volume of pertechnetate needed for 20 mCi. of activity. Pull up this volume and if necessary add sufficient normal saline to make 2 ml. of pertechnetate solution. Print the appropriate subtraction and product tickets.

5. Aseptically inject the pertechnetate into the mixing vial and withdraw an equal volume of air. This will give a final volume of 4 ml. Mix the solution thoroughly.

6. Incubate the labeled product at room temperature for at least 10 minutes before dispensing.

7. Check the pH. and record (3.0 - 4.0)

8. Perform ITLC using silica gel (SG) paper with acetone as solvent. Do not use the product if less than 85% label.

9. DO NOT USE THE PRODUCT MORE THAN TWO HOURS FROM THE TIME OF PREPARATION. REPEAT QC PRIOR TO EACH DOSE WHEN USED OVER 30 MINUTES FROM PREPARATION TIME.

5 Mar 1990

#### Jul 1987

TECHNETIUM TC-99m PENTETATE KIT (MPI DTPA by Medi-Physics)

#### KIT PREPARATION INSTRUCTIONS

- 1. Waterproof gloves should be worn during the preparation procedure.
- 2. Remove the central plastic disc from the MPI DTPA vial and swab the tip of the vial closure with alcohol to sanitize the surface.
- 3. Place the vial in a suitable radiation shield.
- 4. Calculate the required amount of TcO₄ (range 15 to 250 mCi.) and draw this amount into a shielded syringe. If required, add sufficient normal saline to five a final volume of 4 ml. Place the syringe in the dose calibrator to measure the radioactivity and print the product ticket.
- 5. Slowly inject the TcO<sub>4</sub> into the vial which had been placed in the shield.
- 6. Prior to removing the needle, withdraw an equal volume of air as was injected into the vial.
- 7. Swirl the contents of the vial for one minute and let stand 1 or 2 minutes.
- 8. Determine pH of the product. (3.8 7.5)
- 9. Perform ITLC chromatography using Silica Gel (SG) paper with acetone for the solvent. The desired product will stay at the origin. Record the results. Do not use if chromatography indicates more than 10% free TcO<sub>4</sub> is present.
- 10. Examine vial contents for particulates prior to injection. If cloudy, do not use.
- 11. Use within eight hours of preparation.

Nuclear Pharmacy SOP

5 Mar 1990

## Product: Tc-99m Gluceptate by Mallinckrodt May 1988

## KIT PREPARATION INSTRUCTIONS

1. Latex gloves should be worn during the preparation.

2. Calculate the required amount of TCO, to add to the vial. Usually add 80 mCi in a total of 2 ml.

3. Aseptically add the pertechnetate to the shielded reaction vial and remove an equal volume of air to maintain a negative pressure. Swirl for 30 seconds.

4. Assay and print the appropriate dose calibrator tickets to account of  $TcO_4$  Using proper shielding visually inspect to insure that the solution is clear and free of particulate matter. Do not use if either is present.

5. Check and record the pH. (5.5 - 7)

6. Perform ITLC chromatography using silica gel (SG) paper with acetone as solvent. Do not use if less that a 90% label.

7. Use within eight hours from time of preparation.

5 Mar 1990

#### JUL 1987

## Technetium-99m DISOFENIN (HEPATOLITE BY NEN)

#### KIT PREPARATION INSTRUCTIONS

- 1. Assemble the following items prior to preparation: 1 vial od Disofenin, vial shield, 3 ml syringe, normal saline without bacteriostatic agent.
- 2. Latex gloves should be worn during the preparation.
- 3. Remove the plastic disc from the vial, swab the top of the vial closure with alcohol and let the alcohol dry.
- 4. Place the vial in a suitable radiation shield.
- With a sterile shielded syringe, aseptically obtain not more than 100mCi TcO<sub>4</sub> solution in 2 to 3 ml. THE GOAL IS 20mCi/ml.
   Aseptically add the TcO<sub>4</sub> to the vial in the lead shield and withdraw an equal amount of air from the vial.
- 7. Swirl the contents of the vial for 1 minute and let stand 1 to 2 minutes
- 8. Print appropriate calibrator dose tickets to account for TcO<sub>4</sub> used and to create a product ticket for disofenin.
- 9. Examine vial contents for particulates prior to injection.
- 10. Check pH.
- 11. Perform ITLC chromatography using <u>polysilicic acid gel (SA)</u> paper with 20% saline as the solvent. Record the results. Do not use if less than 90% label.
- 12. Use within eight (8) hours from the time of preparation.

Product: Tc-99m Macroaggreated Albumin (MAA) (Pulmolite by NEN or MPI MAA by Medi-Physics) May 1988

## KIT PREPARATION INSTRUCTIONS

1. Latex gloves should be worn during the preparation.

2. Calculate the amount of TCO<sub>4</sub> to be added aseptically to the shielded vial. Recommend maximum of 60 mCi. (Usually use 60 mCi. TCO<sub>4</sub> and add sufficient normal saline U.S.P. to make 6 ml total volume. This gives a concentration of about 1 million particles per milliliter.) Draw this amount into the shielded syringe. Place the syringe in the dose calibrator to measure the radioactivity and print product and subtract ticket.

3. Add  $TcO_4$  down the side of the vial and withdraw air from the vial to maintain negative pressure.

4. After addition of the pertechnetate, swirl for a few seconds and allow to stand for five (5) minutes. During the mixing process do not shake the product enough to cause foaming of the solution. 5. Determine the pH of the product. (3.8 - 8.0).

6. Perform ITLC chromatography using Silica Gel (SG) paper with normal saline as solvent. The desired product will stay at the origin. Do not use the product if less than a 90% label.

7. Prior to withdrawing a dose, the contents of the vial should be sufficiently agitated to effect homogenous suspension of the aggregated albumin.

8. Store the vial in the shield in the refrigerator at 2 to 8 degrees C.

9. Discard the solution after six(6) hours from time of preparation.

10. SPECIAL NOTE: DO NOT EXCEED 1 ML VOLUME PER SINGLE PATIENT DOSE.

5 Mar 1990

#### HSHN-XN

## Product: Tc99m Medronate (Tc-MDP by Medi-Physics Inc) May 88

## KIT PREPARATION INSTRUCTIONS

1. Latex gloves should be worn during the preparation procedure. 2. Remove the central plastic disc from the MPI MDP Kit vial and swab the top of the vial closure with alcohol to sanitize the surface.

3. Place the vial in a suitable radiation shield.

4. Calculate the required amount of TCO<sub>4</sub> (range 15 to 500 mCi.) and draw this amount into a shielded syringe. If required, add sufficient normal saline to give a final volume of 6 ml. Place the syringe in the dose calibrator to measure the radioactivity and print the product ticket.

5. Slowly inject the TcO, into the vial which had been placed in the shield.

6. Prior to removing the needle withdraw an equal volume air from the vial.

7. Swirl the contents of the vial for one minute and let stand 1 or 2 minutes.

8. Determine the product pH. (4.0-7.4)

9. Perform ITLC chromatography using Silica Gel (SG) paper with acetone for the solvent. The desired product will stay at the origin. Record the results. Do not use if more than 10% free TcO<sub>4</sub> is present.

10. Examine the vial contents for particulates prior to injection. If cloudy do not use.

11. Use within eight hours of preparation.

5 Mar 1990

Product: Stannous Pyrophosphate for <u>BLOOD POOL IMAGINE</u> TechnescanPYP by Mallinckrodt. May 1988

#### KIT PREPARATION INSTRUCTIONS

1. Reconstitute the PYP vial with 2.4 ml. of normal saline 2. Shake the reaction vial sufficiently to bring the lyophilized powder into solution. Allow to stand until all particles are dissolved and in solution. This is usually less than five minutes. The resulting solution should be clear and colorless. If not the vial should not be used.

3. Administer 1 ml. per patient dose by direct venepuncture. 4. Write the time and date of preparation on the vial. Store the vial at room temperature under the laminar flow hood and use within 6 hours after reconstitution.

#### 5 Mar 1990

#### HSHN-XN

Product: Technetium 99m pyrophosphate (Technescan PYP by Mallinckrodt) May 1988

#### KIT PREPARATION INSTRUCTIONS

1. Latex gloves should be worn during the preparation.

2. Calculate the amount of pertechnetate solution required. (Use 60 mCi. in a total of 2 ml.). Pull up the required activity, make the dilution if needed, and assay the activity. Make the required subtraction and product tickets in the dose calibrator.

3. Aseptically add the pertechnetate solution to the shielded mixing vial and remove an equal volume of air.

4. Mix thoroughly and allow to stand at room temperature for 5 minutes.

5. Check the pH. (4.5 - 6.0)

6. Perform ITLC using silica gel (SG) paper and acetone. If the label is less than 90% do not use the product.

7. Store in the shielded vial at room temperature and use within 6 hours.

## 5 Mar 1990

## Product: Tc-99m Sulfur Colloid (TechneColl by Mallinckrodt) Jul 87.

## KIT PREPARATION INSTRUCTIONS

1. Latex gloves should be worn during the preparation procedure 2. Assemble the following items prior to preparation: Technecoll kit from Mallinckrodt which contains a reaction vial (2 ml. of phosphoric acid, 100 mg.) syringe I (1.1 ml with 12 mg. gelatin and 9 mg. sodium chloride also 0.5 ml with 12 mg. sodium thiosulfate, and syringe II (0.6 ml. with 36 mg. gelatin and 9 mg of sodium chloride also 1.0 ml with 544 mg sodium acetate and 5 mg edetate disodium).

3. Start the water bath and heat water to boiling.

4. Calculate the required amount of TCO, ( range 5mCi to 120 mCi in a maximum of 5 ml.) and draw this amount into the syringe noting the volume used. Place the syringe in the dose calibrator to measure the radioactivity and print product ticket. Note: There is 5 ml in the reaction vial and the 2 syringes.

5. Place the reaction vial into the shield and add the  $TcO_4$ . 6. Immediately add syringe I.

7. Place the reaction vial in the boiling water for 8 minutes.

8. Remove the reaction vial from the water bath ( solution will appear milky white) and using a 20 ml. syringe, vent the pressure from the reaction vial.

9. Add syringe II to the reaction vial.

10. Place the reaction vial in boiling water for 2 minutes.

11. Remove the reaction vial from the water bath and cool.

12. Determine the pH of the product (4.0 - 7.5).

13. Perform ITLC using SG paper with normal saline as the solvent. The desired product will stay at the origin. Record the results. Do not use if less than 92% label.

14. Use with 8 hours of preparation.

#### 5 Mar 1990

Product: Tc-99m Sulfur Colloid (TechneColl by Mallinckrodt) Jul 87

#### KIT PREPARATION INSTRUCTIONS

1. Latex gloves should be worn during the preparation procedure 2. Assemble the following items prior to preparation: Technecoll kit from Mallinckrodt which contains a reaction vial (2 ml. of phosphoric acid, 100 mg.) syringe I (1.1 ml with 12 mg. gelatin and 9 mg. sodium chloride also 0.5 ml with 12 mg. sodium thiosulfate, and syringe II (0.6 ml. with 36 mg. gelatin and 9 mg of sodium chloride also 1.0 ml with 544 mg sodium acetate and 5 mg edetate disodium).

3. Start the water bath and heat water to boiling.

4. Calculate the required amount of TcO<sub>4</sub> ( range 5mCi to 120 mCi in a maximum of 5 ml.) and draw this amount into the syringe noting the volume used. Place the syringe in the dose calibrator to measure the radioactivity and print product ticket. Note: There is 5 ml in the reaction vial and the 2 syringes.

5. Place the reaction vial into the shield and add the TcO<sub>4</sub>.

6. Immediately add syringe I.

7. Place the reaction vial in the boiling water for 8 minutes.

8. Remove the reaction vial from the water bath ( solution will appear milky white) and using a 20 ml. syringe, vent the pressure from the reaction vial.

9. Add syringe II to the reaction vial.

10. Place the reaction vial in boiling water for 2 minutes.

11. Remove the reaction vial from the water bath and cool.

12. Determine the pH of the product (4.0 - 7.5).

13. Perform ITLC using SG paper with normal saline as the solvent. The desired product will stay at the origin. Record the results. Do not use if less than 92% label.

14. Use with 8 hours of preparation.

## Product: Tc-99m HMPAO (Tc-Ceretec by Amersham Inc.)

#### **KIT PREPARATION INSTRUCTIONS**

1. Latex gloves should be worn during the preparation procedure.

2. Remove the center disc from the CERETEC vial and swab with alcohol.

3. Place the vial in a vial shield.

4. Using a 10 ml. shielded syringe prepare 30 mCi of TcO4 in 5 ml. of normal saline.<sup>1</sup> Place the syringe in the dose calibrator and prepare a product ticket. 5. Inject the activity into the shielded vial and withdraw an equal volume of headspace.

6. Proceed with QC within 5 minutes of product preparation.

7. Use the product within 30 minutes of preparation time.

#### QUALITY CONTROL OF HMPAO

1. Prepare a vial with 0.5 cm of Methyl Ethyl Ketone (MEK) in it.

2. Use the normal saline QC flask for a second strip.

3. Use SG ITLC paper for both tests.

4. Place a drop of Tc-HMPAO about 1 cm from the bottom of each strip.

5. Allow the strips to run and cut them in half.

6. Lipophilic HMPAO (HMPAOL) should be at least 80%

The distribution of the substituents are as follows:



Percent HMPAO<sub>L</sub> = % HMPAO<sub>L</sub> + TcO4 (MEK strip) minus - % TcO4 (NaCl strip)

1 Generator must have been eluted within TWO HOURS of preparation time of HMPAO  $\hfill \hfill \hfi$ 

## Technetium-Mertiatide (MAG3) by Mallinckrodt

#### **KIT PREPARATION INSTRUCTIONS**

1. Put on Latex Gloves

2. Swab the top of the vial rubber septum with ispropyl alcohol

3. Prepare a rolling water bath.

4. a. Insert a filtered venting needle into the septum.

b. Inject 100 mCi. of TcO4 in a volume of 4 ml into the vial.

c. After adding the TcO4 draw 2 ml of air back into the syringe.

5. Withdraw the venting needle and syringe from the vial; invert the vial several times to fully dissolve the powder.

6. Place the reaction vial into the boiling water bath for 10 minutes.

7. a. Remove from bath and cool for 10 minutes.

b. Inspect the solution for clarity and particulate matter. If it is cloudy or if particulates are present do not use.

8. Label the vial and store at room temperature. Use within six hours.

9. Radiochemical purity must be checked prior to use. If the radiochemical purity is less than 90% do not use.

#### QUALITY CONTROL

#### PREPARATION OF SEP-PAK CARTRIDGE

a. Using a 3 ml syringe, push 1 ml of ethanol thru the cartridge; discard the eluate.

b. Push 1 ml of 0.001N HCl solution thru the cartridge; discard the eluate.

c. Push 3 ml of air thru the cartridge; discard the eluate.

#### QUALITY CONTROL TESTING

a. Using a 1 cc tuberculin syringe, withdraw a sample of MAG3 and insert 0.1 ml into the longer end of the cartridge.

b. Slowly push (dropwise) 3 ml of 0.001N HCl solution thru the cartridge; collect the eluate in a test tube and assay. This eluate contains the hydrophilic (TcO4) forms of radiochemical contaminate.

c. Slowly push (dropwise) 3 ml of 1:1 ethanol/saline solution thru the cartridge; collect in a test tube and assay. This eluate contains the MAG3.

d. Place the cartridge in a test tube and assay. This contains reducedhydrolyzed technetium.

#### CALCULATIONS

$$\%Tc99m - MAG3 = \frac{(Actofethanol/saline)}{(totalAct)}X100$$

$$\%TcO4 = \frac{(ActofHClelution)}{(totalAct)}X100$$

 $\% RH - Tc = \frac{(ActonCartridge)}{(totalAct)} X100$ 

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## KIT PREPARATION INSTRUCTIONS

#### CARDIOLITE

1. Put on latex gloves

2. Place the reaction vial in a vial shield.

3. Swab the top of the rubber septum with isopropyl alcohol.

4. Using a syringe shield prepare 150 mCi. of Tco4 in 3 ml of normal saline.

5. Measure the activity in the syringe and prepare a product ticket.

6. Add the TcO4 to the reaction vial and withdraw an equal volume headspace. 7. Swirl the vial several times.

8. Place the vial in a boiling water bath for 10 minutes.

9. Remove the vial from the water bath, shield, and cool for 15 minutes.

- 10. Visually inspect the vial contents. It must be clear and colorless.
- 11. Use within 6 hours.

#### 12. RADIOCHEMICAL QC

a. Use Aluminum Oxide coated plastic TLC plate (Baker # 1 B-F)

b. Apply 1 drop of ethanol 1.5 cm up the strip.

- c. Immediately add 2 drops of cardiolite side by side on the ethanol.
- d. Evaporate to dryness with compressed air line.
- e. Place the strip in a covered TLC tank containing ethanol.
- f. Develop the strip to within 1 cm. of the end of the strip.
- g. Calculate the % Cardiolite as follows:

 $\%Tc99m-Sestamibi = \left(\frac{(uCiTop)}{(uCiTop+Bottom)}\right)X100$ 

13. Illustration of QC step:

% Tc99m Sestamibi =  $\frac{\mu \text{Ci Top Piece}}{\mu \text{Ci Both Pieces}} \times 100$ 



JUL 1988

## Technetium-99m MEBROFENIN (CHOLETEC BY SQUIBB)

#### DIRECTIONS FOR MANUFACTURE

ľ. Assemble the following items prior to preparation: 1 vial of mebrofenin, vial shield, 3 ml syringe, normal saline without bacteriostatic agent. Latex gloves should be worn during the preparation. 2. Remove the plastic disc from the vial, swab the top of the З. vial closure with alcohol and let the alcohol dry, Place the vial in a suitable radiation shield. 4. With a sterile shielded syringe, aseptically obtain not more 5. than 100mCi TcO<sub>4</sub> solution in 2 to 5 ml. THE GOAL IS 20mCi/ml. Frint appropriate calibrator dose tickets to account for  $TcO_4$ 6. used and to create a product ticket for mebrofenin. Aseptically add the  $TcO_4$  to the vial in the lead shield and 7. withdraw an equal amount of air from the vial. Swirl the contents of the vial gently for 1 minute and LET 8. STAND FOR 15 MINUTES. Examine vial contents for particulates prior to injection. 9.

10. Check pH. ( range is 4.2 TO 5.7)

11. Perform ITLC chromatography using <u>polysilicic acid gel (SA)</u> paper with 20% saline as the solvent. Record the results. Do not use if less than 90% label.

12. USE WITHIN EIGHTEEN (18) HOURS from the time of preparation.

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Nuclear Pharmacy SG8

#### Accountability of Sealed Source Markers

). Powied source markers are used in nuclear medicine to stablish anatomical position and tize of underlying structures. Therefore, markers are maintained in the nuclear medicine clinic and must be reactly available to imaging technologists.

2. In order to maintain control of these markers a log sheet is kept in the radiothanmacy. "pic log titled "SIGN OUT LOG FOR BEALED POINT & STRING SOURCES" (attached) "identifies the technologist, source, and room where the cource is used. Proper of this log will identify the location of all sealed sources it will provide an indication of use for point and string tources.

3. The log described above must be completed in a timely manner. Unis means all sources must be returned to the radiopharmacy and  $\log$  entries completed prior to the close of the business day.

4. The technologist who signs out the source is responsible for it return. However, when a source cannot be found the a bhologist working in the pharmacy or the nuclear pharmacist neuld be notified immediately.

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=VI-PIP

Dr. Bruce H. Mock Division of Nuclear Medicine UH-P16 Indiana University Medical Center 926 West Michigan St Indianapolis, IN 46223

Dear Sir;

We wish to produce <sup>123</sup>I-MIBG in-house especially to image children with neuroblastoma. I have read with interest your article in Appl. Radiat. Isot.(39:939-942, 1988). If possible could I obtain a copy of your current labelling method, information regarding your source of unlabeled MIBG and requesting an IND, and suggestions toward avoiding pitfalls with this procedure. Thank you for your time and assistance.

Sincerely,

Patrick J. Peller MD Nuclear Medicine Fellow

Commander Chief, Nuclear Medicine ATTN: MAJ PELLER Walter Reed AMC Washington, DC 20307-5001

|                                                   | SIGN OUT LOG FOR SEALED POINT & STRING SOURCES |                                        |                                       |                                       |                                                                                                                 |  |  |
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#### White Cell Separation and Labeling with In-111 Oxine

#### ALL PROCEDURES ARE DONE IN

#### THE VERTICAL HOOD

1. Collect 90ml. of venous blood in two 50-60 ml. syringes containing 1,000 units of heparin and 10 cc of 6% hetastarch (Hespan®) in each syringe (Note: If the patient has a WBC count of greater than 8 x 10<sup>3</sup>, one 50-60 ml. syringeful of blood may be drawn.)

2. Place each syringe of blood into the ringstand mount at a 45° angle. Take care not to allow the blood to come into contact with the top of the syringe as additional contamination with RBC can-result.

3. Allow the red blood cells to settle to the bottom of the syringe for at least one hour.

4. Remove supernatant (platelets, plasma and WBC's), and centri-fuge the supernatant at 450g for five minutes.

5. Pour off the supernatant. (platelets, and plasma also called platelet rich plasma or PRP) and save. Resuspend the WBC buttons with 3 ml. of normal saline using a sterile plastic pipette. Combine the two WBC suspensions in one tube and q.s. to 20 ml. with normal saline. Centrifuge at 450g for five minutes.

6. Centrifuge PRP at 1000g for twenty minutes. When finished, the supernatant is platelet poor plasma (PPP).

7. Remove supernatant and discard from step #5. Add 6 ml. of normal saline to the WBC button and resuspend with pipette.

8. Add In-111 Uxine to the WBC suspension and incubate at room temperature for twenty minutes. Gently agitate 3-4 times during incubation. (Note: The desired cose is 500 microcuries so add approximately 600-650 uCi. in-111 Gxine to the WBC suspension).

9. Add PPP to WBC suspension to bring volume up to 15 ml. and centrifuge at 450g for five minutes.

10. Four off RADIOACTIVE supernatant and save for labeling efficiency. Resuspend WBC button with 8 ml. of fresh PPP. This is the final product for reinjection into the patient.

11. Do labeling yield calculations with labeled WBC and RADIDAC-TIVE supernatant.  $\$ 

#### IN-111 LABELED PLATELET PROCEDURE WRAMC NUCLEAR MEDICINE SERVICE

1. Wipe down the laminar flow Mood with alcohol and allow to evaporate. Set up the water bath at 37 C with a lead shield.

2. Fut 10 cc of sterile normal saline in a sterile syringe and place int the hood. Draw 8 cc of acid-citrate dextrose solution A (ACD-A) into a 50 cc syringe.

3. Assemble stopcock, 50 cc syringe, one 30 cc syringe, tubing and needle. Withdraw atraumatically and aseptically 7 cc of blood and discard. Withdraw 42 cc of blood into the 50cc syringe, mixing the blood with the anticoagulant.

4. Transfer the blood to a sterile centrifuge tube directly from the syringe. Prepare a balance tube and centrifuge at 225 G (950 rpm) for 15 minutes.

5. Pipette platelet rich plasma (PRP) into a new centrifuge tube. If there is no clear separation between the PRP and red cells, risk using a few red blood cells (RBCs) and perform steps 6 and 7. Add 5 cc ACD-A solution/100 cc of PRP.

<u>Steps 6 and 7 are optional.</u> <u>Perform only if significant RBC</u> contamination of PRP is present.

6. Prepare balance tube and spin PRP at 225 G for 10 minutes.

7. Using a sterile plastic pipette, carefully withdraw the PRP into a new centrifuge tube. Take care not to transfer and RBCs.

8. Prepare the balance tube and centrifuge the PRP at 650 G (1600 rpm) for 10 minutes.

9. Separate the platelet poor plasma (PPP) with a new sterile plastic pipette and store in a sterile centrifuge tube at room temperature.

10. Add 2 cc of saline solution to the pellet. Place the tube aside and let stand at room temperature for 10 minutes. Thereafter, the button may be agitated <u>gently</u>, without frothing, to completely resuspend the cells.

11. When the pellet is completely resuspended, place the tube in the water bath, add 600 mcCi of In-111 oxine and incubate at 37 C for an additional 5 minutes.

12. Prepare a balance tube and centrifuge the resuspended platelets at 180 g (850 rpm) for 15 minutes.

13. Decant radioactive supernatant (the empty balance tube may be used). Gently layer 2 cc of saline solution over the pellet

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#### PROCEDURE FOR LABELING HEAT DAMAGED RBCs

1. Inject patient with 15 mg Sn-pyrophosphate

2. Wait 20 minutes

 Withdraw 10ml. whole blood into a 20 ml. syringe which has been heparinized with with 100 units of sodium heparin.
 Flace 10 ml. of this whole blood into a sterile screw top tube.

5. Spin down the RBCs in a centrifuge for 5 minutes at a fast spin of 1000g (2000 rpm)

6. Using aseptic technique and a long spinal needle attached to a 10 ml. syringe, withdraw the plasma and buffy coat.

7. Add the sodium pertechnetate to the packed cells and vortex gently to resuspend the RBCs. Use 8 to 10 mCi to start and end with a final dose of  $3 \pm 0 5 \pm 0$ 

8. - Incubate for 5 minutes using proper shielding.

9. Add normal saline to bring volume up to original volume and vortex gently to resuspend the RBCs.

10. Place this solution RBCs,  $99mTcO_4$ , at original volume, in sealed screw top tube into a water bath with stirrer at <u>49</u> <u>de-</u><u>grees C for 35 minutes</u>. Make sure the level of the blood is below the water level.

11. To assure even heating, every 3 to 5 minutes lift the blood tube out of the water and invert several times and return it to the water bath.

12. Be sure to maintain the temperature below 50 degrees C. Use ice to cool off if necessary.

13. For shielding place a lead sheet around the water bath. 14. After <u>35 minutes</u> spin down this mixture to wash off any unbound pertechnetate for 5 minutes at 2000 rpm.

Withdraw the plasma with a long spinal needle.

16. Add sufficient normal saline to bring back to original volume. Vortex gently to resuspend the RBCs. Use this suspension to reinject into the patient.

Quality control step: withdraw 1 ml. of final solution. Place in a small tube with stopper. Add 2 ml. of normal saline, vortex, spin down 5 minutes at 2000rpm, withdraw supernatant. Measure the supernatant in a dose calibrotor; measure packed cells to determine tagging efficiency.

Tagging Efficiency:

 $\frac{A_r}{A_r + A_r} \times 100$ 

 $A_{r} = activity$  in QC RBC sample  $A_{b} = activity$  in QC plasma sample

#### PROCEDURE FOR LABELING RBC'S FOR GI BLEED

1. Inject patient with 15 mg of Sn-PYP(1 vial). Wait 20 minutes.

2. Withdraw 10 ml whole blood into a syringe heparinized with 100 units heparin.

3. Place 10 `ml of this whole blood into a sterile screw top tube.

4. Spin down the RBC's in a centrifuge for 5 minutes at fastest speed. Using a long needle attached to a 10 ml syringe, withdraw plasma and buffy coat layer.

5. Add the TcO4 to the packed cells. For GI bleed using approximately 28 - 30 mCi. to start with. Final dose is 20 mCi. Vortex gently.

6. Incubate for 5 minutes using proper shielding.

7. Add normal saline to bring up to original volume and vortex gently to resuspend the RBC's.

8. Spin for 5 minutes at fastest speed to wash off unbound 99m-TcO4.

9. Withdraw plasma using a long spinal needle.

10. Add sufficient normal saline to bring up to original volume and vortex to resuspend the RBC's.

11. Quality Control: Withdraw about 0.5ml of final solution. Place in small tube with stopper and add 1.5ml of normal saline. Vortex then centrifuge for 5 minutes at fastest speed. Withdraw plasma, use for channel # 18, use packed cells for # 19. The desired tag is over 90%.

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#### NUCLEAR MEDICINE TECHNOLOGIST COURSE

#### TRAINING IN NUCLEAR PHARMACY AT WALTER REED ARMY MEDICAL CENTER

Program Goal: To provide education, training, and laboratory experience in nuclear pharmacy to phase two nuclear medicine technology students.

Facility:

The Nuclear Pharmacy is located in the Nuclear Medicine Service at Walter Reed Army Medical Center. The Nuclear Pharmacy provides individualized doses of diagnostic and therapeutic radiopharmaceuticals to the patient population served by the medical center. In a teaching role, the nuclear pharmacist instructs nuclear medicine residents, radiology residents, and nuclear medicine technologists in aspects of radiopharmacy appropriate for each group.

| Instructor: | TERRY | R.   | MINTO | DN 3 | R.Ph. | BCNP  |         | Ŧ       |      |
|-------------|-------|------|-------|------|-------|-------|---------|---------|------|
|             | Major | , U1 | nited | St   | ates  | Army, | Medical | Service | Corp |

Course Description:

In order to provide a course of instruction which satisfies both academic curiosity and practical application, the curriculum must accommodate both didactic and laboratory instruction concurrently.

The following outline identifies some of the major subject areas and breaks them into manageable blocks of instruction:

SECTION TOPIC

1 SAFE USE AND HANDLING OF RADIOACTIVE MATERIALS

2 BASIC RADIATION PHYSICS alpha, beta, gamma radiation dosimetry and radiation dose

- 3 REGULATORY ASPECTS OF NUCLEAR PHARMACY NRC regulations NRC license example FDA regulations when should an IND be submitted IND form FD 1571 How to write an IND
- 4 EQUIPMENT NECESSARY IN A NUCLEAR PHARMACY dose calibrators (ion chambers) well counters (scintillation counting)

| C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DISPOSITION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | FORM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| REFERENCE OR OFFICE SYMBOL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | SUBJECT.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| HSHL-XN (385 IIk)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Pediatric Intravenous Access Policy                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| TO, Pediatric Clinic<br>WRAMC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | FROM C, Nuc Med SvcDATE 29 Nov 88CMT 1WRAMC,Dr. Anderson/af/6-0176                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 1. Because of previous pediatric patients, the,                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | problems establishing intravenous access in some following policy has been established.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 2. For pediatric inpati<br>running I.V. (not a hepa<br>their injection(s), thei                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | ents, the current policy of their arriving with a rin lock) will continue. After the completion of r I.V. will not be removed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 3. For pediatric outpat<br>physicians will examine<br>any special circumstance<br>with intravenous access<br>make special request for<br>the nuclear medicine ser<br>(usually two attempts).<br>circumstances exist, the<br>clinic [phone numbers: 6<br>resident (a roster will<br>Nuclear Medicine will ha<br>clinic chief resident is<br>alternate point-of-conta<br>4. The patient (with pa<br>clinic and a running I.V<br>pediatric clinic chief r<br>normally be done and the<br>within 45 minutes of the<br>in establishing intraven<br>their representative will<br>6-0168/0169/0170] so tha<br>made. After the patient | <pre>ients, the nuclear medicine technologists and/or<br/>the patient upon arrival and determine if there are<br/>s to address (e.g. patient with obvious problems<br/>due to previous chemotherapy, patient's parents<br/>pediatrician, etc). Under normal circumstances,<br/>vice will make an attempt at intravenous access<br/>If this is unsuccessful or if special<br/>nuclear medicine service will call the pediatric<br/>-1101/1103/1112], and contact the clinic chief<br/>be provided by the Pediatric Department so that<br/>ve the name of the designated physician). If the<br/>unavailable, the pediatric clinic head nurse is an<br/>ct.<br/>rents and/or attendants) will go to the pediatric<br/>( not a heparin lock) will be started by the<br/>esident, head nurse, or their designee. This will<br/>patient returned to the Nuclear Medicine Clinic<br/>call from Nuclear Medicine. If a delay (&lt;60 mins)<br/>ous access is anticipated by the pediatric clinic,<br/>1 call the nuclear medicine clinic [phone numbers:<br/>t consideration for special arrangements may be<br/>'s need for intravenous access is over, the I.V.</pre> |
| will be discontinued unl<br>5. So that the clinic e<br>appointments for pediatr<br>earlier than 1000 hours.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | hief resident will be available, nuclear medicine<br>ic outpatients will routinely be scheduled no                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Clert A. ANDEREDUCIÓN                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | CHIEF, NUCLEAR MEDICINE SERVICE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

HSHL-XN (340a)

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#### October 2, 1990

#### MEMORANDUM FOR: HEALTH PHYSICS OFFICER

### SUBJECT: Receipt of Radiopharmaceuticals

The following personnel are herefy authorized to sign for radiopharmaceuticals:

MAJ TERRY MINTON SSG ROBERT VARREN SSG WAYNE LUNKLE SGT ANGEL CUEVAS

laγ INDERSON 16

COL, MC Chief, Nuclear Med Svc

| REFERENCE OR OF                           | , see AR 340-15; the pr<br>FICE SYMBOL                 | SUBJECT                                                             |                                                              |                                                 |          |     |
|-------------------------------------------|--------------------------------------------------------|---------------------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------|----------|-----|
|                                           |                                                        |                                                                     | . <u>.</u> .                                                 | '                                               | · · ·    |     |
| HSHL-XN                                   | · · ·                                                  | Use of Syring                                                       | e Shields in                                                 | Nuclear Medi                                    | cine     |     |
| ro <u> </u>                               |                                                        | FROM                                                                |                                                              | DATE                                            | <u> </u> | CMT |
| All Nuclear<br>Personnel                  | Medicine                                               | C, NUC Med                                                          | Dr                                                           | • Anderson/af                                   | /6 0176  |     |
| · .                                       |                                                        |                                                                     |                                                              |                                                 |          |     |
| 1. The foll<br>Nuclear Med<br>pharmaceuti | owing is the<br>icine Clinic<br>cals.                  | policy for the<br>for the admini                                    | use of syri<br>stration of                                   | nge shields i<br>radio-                         | n the    | · · |
| а                                         | . Syringe st                                           | nields are requ                                                     | ired for all                                                 |                                                 |          |     |
| ·                                         | administra                                             | ations of radio                                                     | nuclides wit                                                 | h exception                                     |          |     |
|                                           | noted abov                                             | ve. Shields wi                                                      | 11 be placed                                                 | on syringes                                     | by<br>be |     |
| · .                                       | placed in:                                             | side the lead c                                                     | arrying pig.                                                 | All other                                       | De       |     |
|                                           | standard p                                             | procedures are                                                      | unchanged.                                                   |                                                 |          |     |
|                                           |                                                        | tod bolow!                                                          |                                                              |                                                 |          | ;   |
| z. Excepti                                | Jis are as no                                          | bled berow.                                                         |                                                              | · ·                                             |          |     |
| -                                         | care, ther<br>decision 1<br>pharmacist<br>supervisor   | the syringe s<br>lies within the<br>t, chief techno                 | hield may be<br>physicians,<br>logist, or i                  | removed. Th<br>radio-<br>maging                 | is<br>·  |     |
| Ь                                         | . Syringe st<br>cisternogr<br>injection,<br>blood volu | nields are not<br>am, MAAAP stud<br>difficult ped<br>umes, red cell | required for<br>y, direct ju<br>iatrics case<br>survivals, e | a<br>gular vein<br>s, Schillings<br>tc. Syringe | ,<br>,   | ,   |
| • .                                       | because of<br>shield.                                  | f the Bremsstra                                                     | hlung radiat                                                 | ion from the                                    | ÷        | •   |
|                                           | ,                                                      |                                                                     |                                                              | AR 40-10 JCA                                    | H. and   |     |
| 3. This po                                | licy/complies                                          | s with/the requ                                                     | iremerts of                                                  | HN 40 10, 00H                                   | ,        |     |
| 3. This po<br>NRC.                        | licy/complies                                          | s with the requ                                                     | arements of                                                  |                                                 | ,        |     |
| 3. This po<br>NRC.                        | licy complies                                          | s with the requ                                                     |                                                              |                                                 |          |     |
| 3. This po<br>NRC.                        | licy complies                                          | JAY H. ANDE<br>COL, MC                                              |                                                              |                                                 |          |     |
| 3. This po<br>NRC.                        | licy complies                                          | JAY H. ANDE<br>COL, MC<br>CHIEF, NUC                                | ERSON                                                        | E SERVICE                                       |          |     |
| 3. This po<br>NRC.                        | licy complies                                          | JAY H. ANDE<br>COL, MC<br>CHIEF, NUC                                | ERSON                                                        | E SERVICE                                       |          |     |
| 3. This po<br>NRC.                        | licy complies                                          | JAY H. ANDE<br>COL, MC<br>CHIEF, NUC                                | ERSON                                                        | E SERVICE                                       |          |     |

6

In order to allay what recently has been increasing confusion regarding patients who seemingly appearing unannounced to the Nuclear Medicine Service for treatment the following guidelines are being implemented.

1. Endocrine physician communicates personally with a Nuclear medicine service physician

A. This is imperative so that points of contact and continuity for the treatment of this patient is established on both services.

B. Joint discussion of treatment goals and projected dosage

C. One physician from each service to serve as points of contact and who will manage the therapy.

#### 2. Nuclear medicine worksheet generated (sample attached)

A. This worksheet serves three purposes

1. A check list of the necessary information necessary prior to treatment.

particularly high dose inpatient treatment

2. Provides a planning and scheduling document to insure that the Nuclear medicine service is prepared for the patient when he or she arrives

3. A reference source for both the Endocrine and Nuclear medicine services

a. Documents the communication referred to in paragraph (1 above)

b. In the event the Nuclear medicine physician who initially discussed the case is not available will allow another physician to intelligently take over the treatment.

4. These while be kept in a notebook in the reading room until the treatment has been completed

#### 3. Pharmacy notified by only by NM physician

A. Date of treatment and projected dose

B. To insure that the necessary quantity of I131 is available when the patient presents him or herself for treatment.

C. Endocrine and Nuclear Medicine physicians names attached to request to further ensure continuity of management.

#### 4. Pharmacy arranges with Health Physics Office for inpatient Rx

A. To insure that the room(s) are available at the time of the proposed treatment.

nderson

Chief Nuclear Medicine Service

# **DISPOSITION FORM**

For use of this form, see AR 340-15; the proponent agency is TAGO.

| REFERENCE OR OFFICE SYMBOL                                                                                                                                                                                                                                                                                                                                                                        | SUBJECT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |       |
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| HSHL-XN                                                                                                                                                                                                                                                                                                                                                                                           | Radioisotopes Therapies                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |       |
| Nuc Med Personnel                                                                                                                                                                                                                                                                                                                                                                                 | FROM C. Nuc Med Svc DATE 9 Jan 89                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | CMT 1 |
| WRAMC                                                                                                                                                                                                                                                                                                                                                                                             | WRAMC Dr. Anderson/af/60176                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |       |
|                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |       |
| 1. Orders for therapeut<br>by the Nuclear Medicine<br>regardless of route of a<br>physician. It is within<br>technician or radiopharm<br>immediate supervision, wi<br>that in the interest of<br>better performed by the<br>intravenous), or (2) that<br>have a technician perform<br>occupational radiation es<br>technicians, radiopharmat<br>2. PDC for this action<br>Radiopharmacist 6-0168. | ic radiopharmaceutical doses must be initiated<br>physicians. All radioisotopic therapies,<br>dministration, will be performed by a<br>the discretion of the physician to allow a<br>acist to administer the dose under his<br>hen the supervising physician believes (1)<br>the patient, the administration would be<br>technician or radiopharmacist (i.e.<br>t it is in the interest of the physician to<br>m the administration in order to distribute<br>xposure. The frequency of dosing by<br>cists, and physicians are easily monitored.<br>is Major Minton, Nuclear Medicine |       |
|                                                                                                                                                                                                                                                                                                                                                                                                   | COL, MCV V                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |       |
|                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | *     |
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|                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |       |

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# **DISPOSITION FORM**

For use of this form, see AR 340-15; the proponent agency is TAGO.

| REFERENCE OR OFFICE SYMBOL    | SUBJECT | · .     |            | . Je-  |      |         |      |  |
|-------------------------------|---------|---------|------------|--------|------|---------|------|--|
|                               |         |         |            | · .    |      |         |      |  |
| HSHL-XN                       |         | Nuclear | Medicine   | Policy | for  | TRH Stu | dies |  |
| TQ11 Nuclear Medicine Personn | FROM    | Nuclea  | r Medicine | Sorvi  | DATE | 9 TA    | V 89 |  |

1. The Thyrotropin Releasing Hormone (TRH) stimulation test should be ordered on the Nuclear Medicine consult form or the standard consultation form 513. This must be signed by a physician and acts as the official request and prescription. (Technologist or Physician Assistant signatures must be co-signed.)

CMT 1

Dr. Anderson/af/60176

2. The consult does not have to be approved (or "OD") by a Nuclear Medicine physician.

3. Prior to the administration of the TRH, the Nuclear Medicine technologist will take the blood pressure in the semi-supine position. If the diastolic blood pressure is equal to or greater than 105, than the study is terminated. For these cases, the Nuclear Medicine technologist should write on the consult, that "the diastotic blood pressure was greater than or equal to 105 mm Hg. Because this is a relative contraindication, the test was cancelled. If any questions, please call laboratory. In all cases, the Nuclear Medicine technologist should write the blood pressure on the consult. The Nuclear Medicine technologist should also ask the patient if he/she has had any previous reaction to a TRH test. If the patient has had a reaction, then the technologist should contact the O.D. physician for a decision regarding whether to proceed or not.

4. See the Nuclear Medicine Clinic signature sheet in the Laboratory Book #1 for the list of physicians and technologists authorized to inject TRH.

5. For the TRH injection, the patient should be in a semi-supine or supine position in the appropriate blood drawing "couch". If any reaction occurs, than the Nuclear Medicine O.D. physician should be contacted immediately. If no reaction has occurred within five minutes, the patient may wait in the waiting chairs in the hallway outside the radioimmunoassay lab.

JAY H. ANDERSON COL, MC C, NUCLEAR MEDICINE SVC

#### WALTER REED ARMY MEDICAL CENTER DEPARTMENT OF RADIOLOGY NUCLEAR MEDICINE SERVICE

1 October, 1990

## STERILE PRECAUTIONS FOR VENIPUNCTURES

1. Disposable latex gloves will be worn by all personnel performing venipunctures.

2. Wash hands and change gloves each time before collecting blood from and/or injecting a radiopharmacuetical into a patient.

3. All new needles and syringes used on the Nuclear Medicine Service are sterile. When the protecting cover is removed from a new needle, the needle must not touch anything until it punctures the skin. If it should touch anything, discard it and use a new needle. Never use a needle with a broken seal.

4. Alcohol pads are used to cleanse the site of puncture. Alcohol itself may destroy some of the bacteria present, <u>but it is the rubbing that is important</u>. Rubbing with the pad removes many skin organisms. Do not touch the venipuncture site after cleansing.

5. If you did not enter a vein at one puncture site, replace the needle with a new one before attempting a second puncture. The first needle may have become contaminated and should not be used again.

6. Under no circumstances will a Hickman or Swan-Ganz catheter be entered without prior approval and knowledge of the patient's attending physician.

Jay H. Anderson COL, MC Chief, Nuclear Medicine Service

HSHL-XN

#### September 1986

SEP 90 14

#### 99Mo ASSAY PROCEDURE

1. <u>PURPOSE</u>: The purpose of the SOP is to describe the procedure to assay a low level contamination of Molybdenum-99 in solution with 99m Technetium.

2. <u>DESCRIPTION</u>: The assay kit consists of a lead canister of the proper dimension to accept a 30 milliliter vial and an insertion holder. The characteristics of the canister are such that the 99m Tc reading is reduced to less than 10<sup>-6</sup> of the unshielded reading while the 99Mo reading is reduced by approximately 65%.

The NRC allowable level of 99Mo contamination in Technetium is NMT one part per thousand (NMT 1 uCi 99Mo/mCi 99mTc) nor more than 5 uCi 99Mo per patient dose.

The U.S.P. XX allowable limit 99Mo is not greater than 0.15 uCi per mCi of Technetium 99m per administered dose of the injection, at the time of administration.

NOTE: Because of the differences in half-lives of these two isotopes, the concentration of 99Mo will increase with time.

3. <u>RESPONSIBILITIES</u>: The Mo assay will be performed on every generator elution. In no case will 99mTc eluate be used if either limit of 99Mo contamination is exceeded. Furthermore, any 99Mo contamination level of 0.1 uCi 99Mo/mCi 99mTc will be reported immediately to the radiopharmacist or Chief of the Service for appropriate guidance.

4. ASSAY PROCEDURE: CRC-30 Dose Calibrators

a. Be sure there are no other isotopes near the calibrator.

b. Insert the CAPMAC pig (purple and yellow one) into the CAPMAC assembly. Lower the complete assembly into the well of the dose calibrator.

- c. Pust "Mo Assay" + "Activity" buttons.
- d. Set Patient Dose wheels to 0000.
- e. Dial in sample # ... Dial in sample volume.
- f. Turn key until EEEEE indicates data entry.
- g. Open the canister by holding the handle and rotating the level counterclockwise until it stops. Move the lever to the raised vertical position.
- h. Push "CAPMAC" and "Activity" buttons. Patient dose, sample #, and sample volume remain the same as in steps d, e, & f. Calibrator will display activity in mCi and then flash ----/mCi, ----/mCi.
- i. Turn the key to enter EEEE and push print (front side of dose ticket).
- j. Turn dose ticket over and enter (feed) into printer.

k. Press "Mo Assay" and "Activity" and print.

#### HSHL-XN

September 1986 88 TY 20 PLM .TV/7 SEN

#### NUCLEAR PHARMACY "ON-CALL" PROCEDURE

Before milking the generator, check if there is enough activity left in Elution #1, #2, or #3.

If Yes: Proceed with making the product desired.

If No: Milk the #2 generator and put it in the #2 pig. (Use 10 ml elution vial.)

A single dose ticket is needed for the generator.

1. Insert the CAPMAC pig (purple and yellow one) into the CAPMAC assembly. Lower the complete assembly into the well of the dose calibrator.

2. Set the SAMPLE VOLUME and the SAMPLE NUMBER on the appropriate thumbwheel switches. Sample volume on 10.00 and the sample number on 02. The PATIENT DOSE thumbwheel should be set on all zeroes.

3. Press the button labeled MO ASSAY and the button labeled ACT. NOTE: The blinking display indicates that the operation is incomplete.

4. Rotate the ENTER KEY to register the activity.

5. Open the canister by holding the handle and rotating the lever counterclockwise until it stops. Move the lever to the raised vertical position.

6. Press the button labeled 99m Tc CAP MAC.

7. If no reading is observed, the canister is not open. Repeat step #5.

8. Rotate the ENTER KEY to register the reading. The display will stop blinking after the key is turned. Print this information on the front side of the ticket. Turn the ticket over to print on the back side.

9. Close the canister by lowering the lever to the horizontal position. Lock the canister to the base by holding the handle, pressing down and rotating the lever clockwise until it stops.

10. Remove the complete assembly from the well and remove the CAPMAC PIG from the holder.

11. Press the MO ASSAY button and the ACT button (the Patient Dose, Sample Number and the Sample Volume Buttons remain the same as in step #2).

12. PRINT on the back side of the ticket. This will give the Moly Assay.

|                                         | EAR PHARMACY "ON-CALL                         | " PROCEDURE                  |                                     | 1 Septer                                 | mber 1984           | n<br>Frankriger<br>Frankriger  |
|-----------------------------------------|-----------------------------------------------|------------------------------|-------------------------------------|------------------------------------------|---------------------|--------------------------------|
| REI                                     | ARING A PRODUCT: Exa                          | mple 99m Tc                  | - MAA                               | SEF                                      | 90                  | gry                            |
| .)                                      | Draw up in a syringe<br>Prepare a subtract st | the 99m TcO4<br>ock ticket   | activity needed<br>(Page 1 of tick) | to prepare the<br>et) (NO CARBONS)       | product             | •                              |
|                                         | Press: 99mTc                                  | and                          | DOSE                                | buttons                                  |                     |                                |
|                                         | Set: <u>Patient Dose</u><br>dial in the mCi   | of                           | <u>sample num</u><br>01, 02, 03     | ber                                      | samp<br>does        | <u>le volume</u><br>n't matter |
|                                         | 99mTc displayed o                             | n the                        | depending upon                      | the                                      |                     |                                |
|                                         | calibrator, which                             | is to                        | elution used                        |                                          |                     |                                |
|                                         | be subtracted from                            | elution                      |                                     |                                          | •                   |                                |
|                                         | vial $\#1, \#2, \text{ or } \#3$              | •                            |                                     | 10 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - |                     |                                |
|                                         |                                               |                              |                                     | •                                        |                     |                                |
|                                         | TURN THE KEY to su                            | btract this                  | volume displaye                     | l on the calibra                         | tor from            | the                            |
|                                         | approp                                        | riate elutio                 | n                                   |                                          |                     |                                |
|                                         | Make s                                        | ure that <u>E</u>            | <u>E E E's</u> flash on             | n the display to                         | indicat             | e entry                        |
|                                         | of data                                       | •                            | •                                   |                                          |                     |                                |
|                                         | Print this ticket w                           | ill be the s                 | ubtract stock t                     | icket. This goe                          | s with t            | he generator                   |
|                                         | ticket.                                       |                              |                                     |                                          |                     |                                |
|                                         |                                               |                              |                                     |                                          | •                   | . •                            |
| .)                                      | Place the completed p                         | et.<br>roduct vial           | in the well of                      | the calibrator i                         | n the pl            | astic dipper.                  |
|                                         | To Transfer Molly Ass                         | ay:                          |                                     |                                          | -                   | · ·                            |
|                                         | Press: Mo                                     | button                       | and ALL OTH                         | R BUTTONS OUT                            | . •                 |                                |
|                                         | ASSAY                                         | · ·                          | ·                                   | •                                        |                     |                                |
|                                         | Set: Patient Dose                             |                              | Sample Number                       |                                          | Sample              | Volume                         |
| de                                      | pending 00.01                                 |                              | 08                                  |                                          | dial in             | the total                      |
| or                                      | the 00.02                                     | • . · ·                      |                                     |                                          | volume o            | f final product                |
| elu                                     | tion # 00.03                                  |                              |                                     |                                          |                     |                                |
|                                         | From Elution # used                           | to Sample #                  | of product prep                     | ared with total                          | volume (            | m1) of product                 |
|                                         | <u>TURN THE KEY</u> to tra<br>displa          | nsfer the MO<br>y to indicat | LLY Assay. Make<br>e entry of data  | e sure the <u>E E E</u>                  | <u>E's</u> fla      | sh on the                      |
| • .                                     | Press: 99mTc                                  | and                          | ACT.                                | buttons                                  | :                   | ·                              |
|                                         | The calibrator                                | will flash                   | / mci,                              | -/ mCi,/ m                               | Ci to in            | dicate                         |
|                                         | TURN THE KEY to comp                          | lete the ent                 | ry. Make sure <u>E</u>              | EEE's flash c                            | on displa           | становальної здал.<br>У •      |
|                                         | Print on page 2 of                            | the ticket<br>rint the res   | (no carbons) The<br>ults of Quality | is is now your P<br>Control chromat      | RODUCT T<br>ography | ICKET<br>on the                |
|                                         | reverse of this                               | ticket.                      |                                     |                                          |                     |                                |
| ••••••••••••••••••••••••••••••••••••••• | reverse of this                               | ticket.                      |                                     | · ·                                      |                     |                                |

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### MUCLEAN PHARMACY CHROMATOGRAPHY PROCEDURE USING CRC-30

1. Spot a small drop of product on ITLC(Instant thin layer chromatography paper). Place in developing tank containing appropriate solvent. Let solvent migrate two-thirds the way up the strip. Using tongs remove strip from tank, mark solvent front, using scissors cut strip one half way between origin of spot and solvent front. Place in chromagraphy strip holder tube marked for top and bottom.



1 SEPT 84

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Service States

بدوا الهرق ومطلبة بتطعيب الجاشية الجاري الم

والمروقة فالهجج

THE A DEPART

Volume

2. Place product ticket in printer so that chromatography results will be printed on <u>back</u> of ticket.

19

Sample Number

- 3. Press: 99m rc & Q.C. buttons.
- 4. Dial setup:

80.00

Patient Dose

use last two digits to indicate product number ie: 00.03 for Tc MAA

Place Chromatography tube with bottom strip in the dose calibrator well, let the reading stabilize then <u>Turn Key</u> to enter. Note : Be sure you see <u>EEEE</u> displayed to indicate that the information was entered.

5. Remove the Bottom tube and replace with the Top tube, let the reading stabilize, change the sample number setting to 18, turn key to enter data.

-

indicates % tagged product

indicates % free TcO4

19

18

-

6. Print ticket.

7. Note: Display on ticket

#### PROCEDURE

#### NUCLEAR MEDICINE SERVICE DEPARTMENT OF RADIOLOGY WALTER REED ARMY MEDICAL CENTER

1. <u>PURPOSE</u>: The procedure describes the <u>MANDATORY</u> process by which a patient will be identified prior to injection of a radiopharmaceutical for diagnostic imaging purposes.

2. <u>METHOD OF IDENTIFICATION OF PATIENT</u>: All patients will be required to produce one of three forms of identification:

a. Inpatients - hospital identification bracelet.

b. Outpatients - blue clinic card or

toria in

- military/dependent identification card

The name and social security number on the identification must be matched against the name and social security number on the consult and printed dose ticket.

3. <u>METHOD OF RADIOPHARMACEUTICAL IDENTIFICATION</u>: Each and every radiopharmaceutical is assigned a unique radiopharmacy number. This number is stamped on the patient's consult, the pharmacy dose ticket, and the individual dose. Once a positive patient identification is made, the radiopharmacy number must be verified on both of the dosing documents and on the syringe. In addition, the color coded pharmaceutical sticker on the syringe should be matched against the radiopharmaceutical ordered on the consult and printed on the dose ticket.

4. Once steps 1-3 above have been completed, the radiopharmaceutical may be injected. The technologist injecting/dosing the patient must sign both the consult and dose ticket and indicate the time of dose administration.

5. <u>PROCEDURE FOR PATIENT IDENTIFICATION FOR ADMINISTRATION OF IN VITRO</u> <u>LABELLED HUMAN BLOOD PRODUCTS</u>: Steps 1-4 must be completed and verified by two people, the radiopharmacist who labelled the blood product and the technologist administering the dose. Both individuals will sign off on the documents listed in step 4.

6. Failure to follow the procedure rigorously could result in an adverse impact on patient care and as such any lapse in this procedure will result in administrative corrective measures.

#### NUCLEAR PHARMACY DAILY CHECKLIST JAN 87

- 1. Prepare elution & compounding vials & paperwork for the next day.
- 2. Integrate the 2nd copy of the dose tickets into the numerical prescription file.
- 3. Make up QC syringes for cameras.
- 4. Make up QC syringes for daily products
- 5. Close out products at the end of the day and do work count.
- 6. Check Radiopharmacy & RIA Log Book-make sure all entries have been completed.
- 7. Make up Chromotography Strips to have some on hand.
- 8. Survey work surfaces-record results in Survey Log Bk.
- 9. Restock needles, syringes, alcohol, pads, etc, in RP preparation area.
- 10. Empty rad waste-deliver to 2nd floor dock to Health
- Physics Wednesday afternoons 1330-1430 hours.
- 11. Daily calibrator check.
- 12. Order supplies.
- 13. Prepare 10 Saline and 10 Heparin Syringes
- 14. Inventory R.P. and Kits on Mondays of stock level and expiration dates.
- 15. Check and record temperature of refers. in Nuclear Pharmacy.

#### NUCLEAR MEDICINE SERVICE WALTER REED ARMY MEDICAL CENTER

#### PEDIATRIC DOSES

I. Radionuclide Studies

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**PEDIATRIC DOSE =** 

#### Surface Area of Child's Body X Adult Dose Surface Area of Adult's Body

0.7

The body surface area may be estimated from the body weight to within # 8% s.d.:

Body Surface area = (Body Weight (Kg))

Schedule for calculation of pediatric doses:

| 1 1    |        |             |        | I      |        |       |
|--------|--------|-------------|--------|--------|--------|-------|
| Weight | Weight | Fraction of | DOSE   | DOSE   | DOSE   | DOSE  |
| 15     | Kg     | Adult Dose  | 20 mCi | 15 mCi | 10 mCi | 5 mCi |
| 2.2    | 1 Kg   | 0.05        | 1.0    | 0.8    | 0.5    | 0.3   |
| 4.4    | 2 Kg   | 0.09        | 1.7    | 1.3    | 0.9    | 0.4   |
| 6.6    | 3 Kg   | 0.12        | 2.3    | 1.7    | 1.2    | 0.6   |
| 8.8    | 4 Kg   | 0.14        | 2.8    | 2.1    | 1.4    | 0.7   |
| 11     | 5 Kg   | 0.16        | 3.3    | 2.5    | 1.6    | 0.8   |
| 13.2   | 6 Kg   | 0.19        | 3.7    | 2.8    | 1.9    | 0.9   |
| 15.4   | 7 Kg   | 0.21        | 4.2    | 3.1    | 2.1    | 1.0   |
| 17.6   | 8 Kg   | 0.23        | 4.6    | 3.4    | 2.3    | 1.1   |
| 19.8   | 9 Kg   | 0.25        | 5.0    | 3.7    | 2.5    | 1.2   |
| 22     | 10 Kg  | 0.27        | 5.4    | 4.0    | 2.7    | 1.3   |
| 26     | 12 Kg  | 0.30        | 6.1    | 4.6    | 3.0    | -1.5  |
| 31     | 14 Kg  | 0.34        | 6.8    | 5.1    | 3.4    | 1.7   |
| 35     | 16 Kg  | 0.37        | 7.4    | 5.6    | 3.7    | 1.9   |
| 40     | 18 Kg  | 0.40        | 8.1    | 6.1    | 4.0    | 2.0   |
| 44     | 20 Kg_ | 0.44        | 8.7    | 6.5    | 4.4    | 2.2   |
| 48     | 22 Kg  | 0.47        | 9.3    | 7.0    | 4.7    | 2.3   |
| 53     | 24 Kg  | 0.49        | 9.9    | 7.4    | 4.9    | 2.5   |
| 57     | 26 Kg  | 0.52        | 10.5   | 7.8    | 5.2    | 2.6   |
| 62     | 28 Kg  | 0.55        | 11.0   | 8.3    | 5.5    | 2.8   |
| 66     | 30 Kg  | 0.58        | 11.6   | 8.7    | 5.8    | 2.9   |
| 70     | 32 Kg  | 0.61        | 12.1   | 9.1    | 6.1    | 3.0   |
| 75     | 34 Kg  | 0.63        | 12.6   | 9.5    | 6.3    | 3.2   |
| 79     | 36 Kg  | 0.66        | 13.1   | 9.9    | 6.6    | 3.3   |
| 84     | 38 Kg  | 0.68        | 13.6   | 10.2   | 6.8    | 3.4   |
| 88     | 40 Kg  | 0.71        | 14.1   | 10.6   | 7.1    | 3.5   |
| 92     | 42 Kg  | 0.73        | 14.6   | 11.0   | 7.3    | 3.7   |
| 97     | 44 Kg  | 0.76        | 15.1   | 11.3   | 7.6    | 3.8   |
| 101    | 46 Kg  | 0.78        | 15.6   | 11.7   | 7.8    | 3.9   |
| 106    | 48 Kg  | 0.80        | 16.1   | 12.1   | 8.0    | 4.0   |
| 110    | 50 Kg  | 0.83        | 16.5   | 12.4   | 8.3    | 4.1   |
| 114    | 52 Kg  | 0.85        | 17.0   | 12.7   | 8.5    | 4.2   |
| 119    | 54 Kg  | 0.87        | 17.5   | 13.1   | 8.7    | 4.4   |
| 123    | 56 Kg  | 0.90        | 17.9   | 13.4   | 9.0    | 4.5   |
| 128    | 58 Kg  | 0.92        | 18.3   | 13.8   | 9.2    | 4.6   |
| 132    | 60 Kg  | 0.94        | 18.8   | 14.0   | 9.4    | 4.7   |
| 136    | 62 Kg  | 0.96        | 19.2   | 14.4   | 9.6    | 4.8   |
| 141    | 64 Kg  | 0.98        | 19.6   | 14.7   | 9.8    | 4.9   |
| 143    | 65 Kg  | 1.00        | 20 .   | 15     | 10     | 5.0   |

Adapted from: A.E. JAMES, H.N. WAGNER, & R.E. COOKE, <u>Pediatric Nuclear Medicine</u>, Saunders Company, 1974. p.92.

II. Potassium Perchlorate and other Non-radioactive medications use: YOUNG'S RULE

PEDIATRIC DOSE =  $\frac{AGE}{AGE + 12}$  X ADULT DOSE

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| EXAM                     | ISOTOPE               | DOSE uCi/ka                     | MIN              | MAX                             |
|--------------------------|-----------------------|---------------------------------|------------------|---------------------------------|
| Brain                    | TCDTPA                | 250 uCi/ka                      | 2 mCi            | 20 mCi.                         |
| Cistemogram              | In-111 DTPA           | 15 uCi./ka                      | 100 uCi.s        | 500 uCi.                        |
| Ling                     | 133-Xe cas            | 100 uCi/ka                      | 3 mCi.           | 20 mCi.                         |
| Cardiovascular           | Muca TcO4             | 250 uCi/ka                      | 3 mCi.           | 20 mCi.                         |
| Thyroid Scan             | TcO4 5                | 150 uCi/ka                      | 2 mCi.           | 10 mCi.                         |
| Liver/Soleen             | Tc-sulfur col         | 50 uCi/ka                       | 500 uCi.         | 5 mCi.                          |
| Heaptobiliarv            | Tc-Choletec           | 50 uCi/ka                       | l mCi.           | 3 mCi.                          |
| Bone Scan                | TC MDP                | 250 uCi/ka                      | 2 mCi.           | 20 mCi.                         |
| Kidnev                   | Tc DIPA               | 150 uCi/ka                      | 2 mCi            | 15 mCi.                         |
|                          | TC DMSA               | 50 uCi/ka                       | 300 uCi.         | 4 mCi.                          |
| Gallium-67               | Ga Citr               | 50 uCi/ka                       | 500 uCi.         | 3 mCi.                          |
| GE Reflux/<br>Aspiration | Tc-sulfur Col         |                                 | -1000 uĆi        |                                 |
| GI Bleed                 | Tc-RBC<br>Tc-Sulf Col | 250 <u>uCi/kg</u><br>100 uCi/kg | 2 mCi.<br>1 mCi. | <u>20</u> <u>mCi.</u><br>5 mCi. |
| Cystogram                | tc-DTPA or<br>Tc-SC   |                                 | 1 mCi            |                                 |
| Meckles                  | TcO4                  | 150 uCi/kg                      | 2 mCi.           | 10 mCi.                         |
| Dacrocystogram           | TeDTPA                | •                               | 100 uCi          |                                 |
| Testicular               | TcO4                  | 250 uCi/kg                      | 2 mCi.           | 10 mCi.                         |

#### \*To age 18 or 120 lb.

Patients over 120 lb will receive an adult dose of technetium labeled radiopharmaceuticals. Radiopharmaceuticals labeled with other isotopes will be dosed BY WEIGHT.

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|      | NUCLEAR MEDICINE PROCEDURES   |                  |                    |       |         |        |         |
|------|-------------------------------|------------------|--------------------|-------|---------|--------|---------|
|      |                               |                  | <b>1</b> 1         |       |         |        |         |
|      |                               |                  |                    |       |         |        |         |
| CODE | STUDY NAME                    | AGENT 1          | DOSE 1             | ROUTE | AGENT 2 | DOSE 2 | ROUTE 2 |
|      | Endocrine System 001-099      | AGENT            | DOSE               | ROUTE | AGENT   | DOSE   | ROUTE   |
| 001  | THYROID SCAN PERTECHNATE      | TcO4             | 10 mCi             | IV    |         |        |         |
| 010  | THYROID SCAN 1123             | 1123             | 100 uCi            | PO    |         |        |         |
| 020  | THYROID SCAN 1131             | 1131             | 30 uCi             | PO    |         |        |         |
| 030  | THYROID NECK AND CHEST 1131   | Dosed under #031 |                    |       |         |        |         |
| 031  | THYROID NECK AND CHEST DOSING | 1131             | 10 mCi             |       |         |        |         |
| 032  | THYROID DOSIMETRY             | 1131             | <sup>·</sup> 5 mCi | PO    |         |        |         |
| 034  | THYROID NECK AND CHEST TI201  | TI201            | 2.2 mCi            | IV    |         |        |         |
| 039  | THYROID UPTAKE DOSING         | 1131             | 7uCl               | PO    |         |        |         |
| 040  | THYROID UPTAKE                | Dosed under #039 |                    |       |         |        |         |
| 041  | PERCHLORATE DISCHARGE         | 1131             | 10 uCi             | PO    | KCIO4   | 1 gm   | PO      |
| 043  | SUBSTERNAL GOITRE SCAN        | 1131             | 30 Ucl             | PO    |         |        |         |
| 070  | 131 Rx HYPERTHYRODISM         | 1131             | Varied             |       |         |        |         |
| 072  | 131 Rx METASTATIC THYROID CA  | 1131             | Varied             |       |         |        |         |
| 080  | ADRENAL SCAN NP-59            | Dosed under #08  | 31                 |       |         |        |         |
| 081  | NP-59 DOSING                  | NP59             | 1-2 mCi            |       |         |        |         |
| 085  | ADRENAL MEDULLARY SCAN MIBG   | Dosed under #08  | 36                 |       |         |        |         |
| 086  | MIBG DOSING                   | MIBG             | 500 uCi            | ;     |         |        |         |
| 990  | PARATHYROID SCAN              | TI201            | 2 mCi              | IV    | TcO4    | 2 MCi  | IV      |
|      |                               |                  |                    |       |         |        |         |
|      | Hematopoietic System 100-173  | AGENT            | DOSE               |       | AGENT   | DOSE   |         |
| 121  | LYMPHSCINTOGRAPHY             | TcSbSc           | 1.0 mCi x 2        |       |         |        |         |
| 160  | P32 INTRAVENOUS RX            |                  | Varied             |       |         |        |         |
| 161  | P32 INTRAPERITIONEAL RX       |                  | Varied             |       |         |        |         |
| 171  | BLOOD AND/OR PLASMA VOLUME    | Cr51             | 35 uCi             | ١V    | I125HSA | 10 uCl | IV      |
|      |                               |                  |                    |       | •       |        |         |

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|     |                                        |         |         |    |            |           | _  |
|-----|----------------------------------------|---------|---------|----|------------|-----------|----|
|     | Gastrointestinal System 200-299        | AGENT   | DOSE    |    | AGENT      | DOSE      |    |
| 200 | LIVER SPLEEN SCAN (PLANAR)             | TcSc    | .5 mCi  | IV |            |           |    |
| 203 | HEMANGIOMA LIVER (TOMO)                | SnPYP   | 15 mg   | ١V | TcO4       | 20 mCi    |    |
| 210 | HEPATOBILIARY STUDY                    | TcChole | 5 mCi   | iV |            |           |    |
| 211 | HEPATOBILIARY IMAGING (PEDS-ATRESIA)   | TcChole | 5 mCi   | IV |            |           |    |
| 213 | GALLBLADDER EJECTION FRACTION          | TcChole | 5 mCi   | IV | ССК        | 0.1 mg/kg | ١٧ |
| 220 | SALIVARY GLAND IMAGING (PAROTID)       | TcO4    | 5 mCi   | ١V |            |           |    |
| 230 | MECKEL'S SCAN                          | TcO4    | 10 mCi  | IV | Cimetadine |           |    |
| 240 | GI BLEEDING STUDY (RBC)                | SnPyp   | 15 mg   | IV | TcO4       | 20 mCi    | IV |
| 241 | GI BLEEDING STUDY (SULFUR COLLOID)     | TcSc    | 10 mCi  | IV |            |           |    |
| 250 | ESOPHAGEAL CLEARANCE (CORNFLAKES)      | TcDTPA  | 500 uCi | PO |            |           |    |
| 251 | ESOPHAGEAL REFLUX STUDY                | TcSc    | 1 mCi   | PO |            |           |    |
| 252 | MILK ASPIRATATION STUDY                | TcSc    | 1 mCi   | PO |            |           |    |
| 261 | GASTRIC EMPTYING STUDY (SCAMBLED EGGS) | TcSc    | 500 uCi | PO |            |           |    |
| 280 | SHILLING TEST                          | Co57B12 | 0.5 uCi | PO |            |           |    |
|     |                                        |         |         |    |            |           |    |



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|     | Musculo-skeletal System 300-399         | AGENT     | DOSE     |           | AGENT  | DOSE    |       |
|-----|-----------------------------------------|-----------|----------|-----------|--------|---------|-------|
| 300 | BONE SCAN (WHOLE BODY PLANAR)           | TcMDP     | , 20 mCi | . IV      |        |         | •     |
| 310 | BONE SCAN (PAIN PELVIS/LOWER EXTREMITY) | TcMDP     | 20 mCi   | IV.       |        |         |       |
| 395 | JOINT IMAGING                           | TcO4      | 10 mCi   | ١V        |        |         |       |
|     |                                         |           |          |           |        |         |       |
|     | Cardiovascular System 400-499           | AGENT     | DOSE     |           | AGENT  | DOSE    |       |
| 400 | REST MUGA                               | SnPyp     | 7.5 mg   | IV        | TcO4   | 25 mCi  | IV    |
| 405 | EXERCISE MUGA                           | SnPyp     | 7.5 mg   | IV        | TcO4   | 30 MCi  | ١V    |
| 410 | REST FIRST PASS STUDY (RV EF)           | SnPyp     | 7.5 mg   | IV        | TcO4   | 25 mCi  | IV IV |
| 415 | EXERCISE FIRST PASS STUDY               | SnPyp     | 7.5 mg   | ١V        | TcO4   | 30 MCi  | ١V    |
| 420 | REST THALLIUM (PLANAR)                  | TI201     | 2.2 mCi  | IV        |        |         |       |
| 425 | STRESS THALLIUM (PLANAR)                | TI201     | 3.0 mCi  | IV        | TI201  | 1.0 MCi | íV    |
| 426 | STRESS THALLIUM (TOMO)                  | TI201     | 3.0 mCi  | IV        | T1201  | 1.0 MCi | iv    |
| 430 | CARDIAC SHUNT EVALUATION                | TcO4      | 10 mCi   | Jugular   |        |         |       |
| 435 | INFARCT AVID SCAN (PLANAR)              | TcPYP     | 20 mCi   | IV        |        |         |       |
| 440 | VENOGRAPHY                              | TcSc      | 7.5 mCi  | IV        | TcDTPA | 7.5 MCi | ١٧    |
|     |                                         |           |          |           |        |         |       |
|     | Respiratory System 500-599              | AGENT     | DOSE     |           | AGENT  | DOSE    |       |
| 500 | V/Q SCAN                                | Xe133     | 15-25mCi | Inhale    | TcMAA  | 5 mCi   | IV    |
| 510 | PERFUSION SCAN ONLY                     | TcMAA     | 5 mCi    | IV        |        |         |       |
| 580 | PREOPERATIVE LUNG EVALUATION            | TcMAA     | 5 mCi    | IV        |        |         |       |
|     |                                         |           |          |           |        |         |       |
| -   | Central Nervous System 600-699          | AGENT     | DOSE     |           | AGENT  | DOSE    |       |
| 600 | BRAIN IMAGING (PLANAR)                  | TcDTPA    | 15 mCi   | ١٧        |        |         |       |
| 610 | CISTERNOGRAPHY                          | In111DPTA | 500 uCi  | IT        |        |         |       |
| 622 | VENTRICULO-PERITIONEAL SHUNT            | TcDTPA    | 10 uCi   | Reservoir | ×      |         |       |
| 630 | CSF LEAKAGE (PLEDGET STUDY)             | In111DPTA | 500 uCi  | IT        |        |         |       |
| 641 | 1123 IMP (TOMO)                         | 1123IMP   | 3-5 MCi  | IV        |        | -       |       |
| 644 | HMPAO (TOMO)                            | TcHMPAO   | ,20 mCi  | IV        | ·      |         |       |
|     |                                         |           |          |           | •      |         |       |

|     | Genitourinary System 700-799             | AGENT            | DOSE    |                 | AGENT    | DOSE    |    |
|-----|------------------------------------------|------------------|---------|-----------------|----------|---------|----|
| 700 | RENAL TX EVALUATION WITH HIPPURAN        | TcDTPA           | 15 mCi  | IV              | I131HIPP | 150 uCi | IV |
| 710 | RENAL IMAGING (DTPA)                     | TcDTPA           | 15 mCi  | IV              |          |         |    |
| 711 | POST CAPTROPRIL RENAL IMAGING (DTPA)     | TcDTPA           | 15 mCi  | iv              |          |         |    |
| 720 | RENAL IMAGING (DMSA)                     | TcDMSA           | 4 mCi   | ١V              |          |         |    |
| 721 | RENAL IMAGING (DMSA TOMO)                | TcDMSA           | 4 mCi   | ١V              | :        |         |    |
| 725 | RENAL IMAGING (HIPPURAN)                 | I131HIPP         | 300 uCi | · · · <b>IV</b> |          |         |    |
| 726 | POST CAPTROPRIL RENAL IMAGING (HIPPURAN) | I131HIPP         | 300 uCi | IV              |          |         |    |
| 730 | LASIX RENAL SCAN                         | TcDTPA           | 15 mCi  | IV              |          |         |    |
| 750 |                                          | TcDTPA           | 1 mCi   | Bladder         |          | ·       |    |
| 760 | TESTICULAR SCAN                          | TcO4             | 10 mCi  | IV              |          |         |    |
|     |                                          |                  |         |                 |          |         |    |
|     | Miscellaneous 900-999                    | AGENT            | DOSE    |                 | AGENT    | DOSE    |    |
| 900 | GALLIUM SCAN                             | Dosed under #901 |         |                 |          |         |    |
| 901 | GALLIUM DOSING                           | Ga67             | 10 mCi  | IV              |          |         |    |
| 910 | WEC SCAN                                 | In111WBC         | 500 uCi | IV              | ·        |         |    |

Page 4

#### RECEIPT OF RADIOPHARMACEUTICALS

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Applies to packages received from the Roche or Syncor radiopharmacies

### I. SURVEY OF PACKAGE:

1. Put on Latex Gloves

Mean Man And 2. Inspect the package for signs of damage. If damage is noted,

3. Measure the package at 1 meter and at the package surface. If it is greater than expected stop and notify the RPO.

| e<br>Maria de la composición de la composici<br>Composición de la composición de la comp | LABEL REQUIRED | <u>LIMITS OF</u><br>TI <sup>1</sup> | RADIATION EXPOSURE<br>AT PACKAGE SURFACE |                                              |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------------------------------------|------------------------------------------|----------------------------------------------|
|                                                                                                                                                                                                                                          | White-I        | NA                                  | <= 0.5 mR/hr                             | e sur en |
|                                                                                                                                                                                                                                          | Yellow-II      | < 1 mR/hr                           | >0.5 mR/hr but<br><= 50 mR/hr            |                                              |
|                                                                                                                                                                                                                                          | Yellow-III     | > 1 mR/hr                           | > 50 mR/hr                               |                                              |

No package shall exceed 200 mR/hr at the surface nor 10 mR/hr at 1 meter.

#### II. WIPE TEST THE PACKAGE:

1. Wipe the exterior of the package with an absorbant paper. A minimum of 4X4 inch area must be wiped.

2. Place the wipe in the Victoreen Wipe Test Counter (model 05-578). Press the "count" button. A green light indicates the wipe has less activity than the allowable threshold activity. If a red fail light is displayed proceed to section III, ANALYSIS OF WIPE TEST RESULTS

3. Wipe the surface of the radiopharmaceutical containers as in step 1 above. Count the wipe as in step 2 above<sup>2</sup>.

Remove the radiopharmaceuticals from the package and store them in their designated areas. Make sure the packing slip agrees with drugs received. Enter the survey and wipe test in the pharmacy computer system for each radiopharmaceutical received. When several radiopharmaceuticals are received in the same package the wipe test and survey results will be the same for each radiopharmaceutical.

1 Transportation Index (TI) is the radiation level in mR/hr at 1 meter from the package surface

2 NRC does not require wipe test of the interior of the package. However, it is good practice to determine if there is removable contamination on the products we receive.

(a) (11)
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#### III. ANALYSIS OF WIPE TEST RESULTS:

When a wipe test fails to pass as indicated by the wipe test counter use the following procedure to ascertain the isotope and activity.

1. When a wipe test has failed the red LED light will be glowing and a value in kilo-disintegrations per minute (KDPM) will be displayed.

2. Remove the wipe from the wipe test counter and place it in a glycine paper pouch. Place the pouch in the well counter attached to the thyroid probe in the thyroid room (7A08). Run the "calibration" procedure to identify the isotope by its emission peak(s).

3. The wipe test counter is set up to read out directly for Technetium-99m in KDPM. For other isotopes it is necessary to convert the displayed KDPM into actual KDPM by using a conversion factor for the isotope. Conversion factors (C.F.) for commonly used isotopes at WRAMC nuclear medicine are as follows:

| ISOTOPE | <b>C.F.</b> |
|---------|-------------|
| I-131   | 0.13        |
| T1-201  | 1.30        |
| Ga-67   | 1,50        |
| In-111  | 0.08        |

The threshold activity for all radiopharmaceuticals received at WRAMC is 2000 dpm/ 100 cm<sup>2</sup> removable contamination. The threshold activities for the above listed isotopes are:

| I-131  | 15.3         | KDPM |
|--------|--------------|------|
| Tl-201 | 1.5          |      |
| Ga-67  | <b>`1.</b> 3 |      |
| In-111 | 25.0         |      |
|        |              |      |

Press the "threshold" button and enter the isotope threshold value using the "change digit" keys. Press the "activity key" to put into memory. Count the wipe in the usual manner described in section II. A green PASS means the contamination is less than 2000 DPM for the isotope being counted. A FAIL displays a KDPM value which must be multiplied by the C.F. to get the actual KDPM value for the wipe. For wipes which result in a FAIL indication notify the RPO.

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FIRE PLAN FOR BUILDING #2 (NEW MEDICAL DREATMENT BACILITY)

FIRE ENERGENCY PROCEDURE:

Procedures must include the fellowing order of importance;

a. Rescue persons in immediate danger.

b: Report the fire immediately.

(1) Make the fire known to everyone in the immediate area,

(2) Call the Fire Department. Use the building fire alarm system. The Fire alarm system will call the Fire Department and also let everyone in the building know there is a fire. The Fire Department should also be called by telephone (dial 63317).

(3) To sound the fire alarm in the building, locate one of the RED, metal boxes mounted on the wall in the hallway and near each stairway door and pull down on the handle on the front of the box.

c. Confine the fire. Close the door to the room where the fire is located.

d. Secure the area.

(1) Close all the doors in the area.

(2) Turn OFF oxygen and gas valves.

(3) Do not allow anyone to go back into the area.

e. Fight the fire with the proper extinguisher. Use extinguishers if fire is small, for example: when the fire is just getting started, a mattress is shouldering and there is just a little smoke, or a fire in a trash can. If the room is full of smoke, GET OUT and CLOSE THE DOOR.

f. Control employees, visitors and patients. There will be visitors, patients and employees from other areas of the building who will not know what to do when a fire takes place. Keep them calm and tell them how to leave the area.

g. Meet the Fire Department and direct them to the fire.

h. Evacuation.

(1) Remove patients from toons to the hallway. From there go down the hallway until you go through the double doors dividing the hallway. Make sure these doors are closed and remain tlosed after everyone has been removed from area of the fire.

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11 APR 88

PERSONNEL POLICY NO: HSHL-XN-1 SUPERSEDES: ALL OTHERS

SUBJECT: INFECTION CONTROL POLICY

1. PURPOSE: To establish guidelines for the Nuclear Medicine Service employees to minimize the risk of infection due to exposure, and prevent the transmission of infective agents to patients, co-workers and the community.

2. GENERAL:

- a. A system of berrier profection (i.e rubber gloves, gown etc) must be used to prevent skin and mucus membrane exposure to biological fluids and/or wounds etc.
- b, All skin defects (cuts, abrasions etc) must be covered with propertive bandages:
- c. Meticulous handwashing, even when gloves are used. If hands or other body surfaces become containinated, they should be washed immediately with soap and water or Hibeclens (each room has been supplied with adequate smounts of Hibeclens).
- 3. Gloves must be worn for contact with any patients' blood or body fluids. This includes fouring phiebotomy, injecting radiopharmaceuticals, etc. Body fluids includes drainage of any type, saliva, sputum, wrine etc.
- e. Gloves must be removed prior to the use of telephone, CRT's or other clean surfaces. Clean, fresh gloves may be worn.
- f. Consuming beverages or food, smoking and applying cosmetics are not permitted in the <u>clinical work</u> areas of Nuclear Medicine.
- 8. All accidents should be reported impediately to your supervisor of Chief Technologist, Appropriate Forms will be filled out (see PPN HSHL-XN-2).
- h, bood and beverages will be stored in the setrigerator marked "Staff Only" in the conference room.

11 JAN 89

HSHL-NIC

MEMORANDUM FOR: All Generators of Infectious Waste at WRAMC

SUBJECT: Proper Packaging of Infectious Waste

1. All generators of infectious waste are reminded that proper packaging procedures must be followed if the waste is to be contained from the site of origin to final disposal.

2. The Infection Control Committee and the Preventive Medicine Service offer the following guidelines for packaging of infectious waste at WRAMC.

a. All infectious waste will either be in standard boxes or in plastic needle and syringe containers.

b. Boxes should be sealed with masking or strapping tape on both top and bottom middle seams and on all four open side seams.

c. The LARGE needle and syringe containers <u>must</u> have the lids taped securely with either masking or strapping tape, since these large lids have a tendency to come open when the containers are transported.

d. The small needle and syringe containers can simply be securely closed A "snap" is generally heard when they are closed correctly.

e. Each container or box must be labeled with WRAMC FORM 801, BURN TAG. The tag must contain the point of origin and a point of contact.

3. Housekeeping personnel are currently being trained not to pick up the boxes and containers if they are not properly sealed and labeled. Additionally, Infection Control personnel will be conducting unannounced environmental rounds with housekeeping supervisors to check on packaging procedures.

4. If there are any questions or comments, please call Infection Control at 64350/51.

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BRENDA J. ROUP LTC, AN Chief, Infection Control

Distribution "A"

#### APPENDIX D (Continued)

#### Section 2

#### **METHODS FOR CALIBRATION OF DOSE CALIBRATOR**\*

All radiopharmaceuticals must be assayed for activity to an accuracy of 10 percent. The most common instrument for accomplishing this is an ionization-type dose calibrator. The instrument must be checked for accurate operation at the time of installation and periodically thereafter.

- A. Test for the following:
  - 1. Instrument constancy (daily)
  - 2. Instrument accuracy (at installation and annually thereafter)
  - 3. Instrument linearity (at installation and quarterly thereafter)
  - 4. Geometrical variation (at installation)
- B. After repair or adjustment of the dose calibrator, repeat all the appropriate tests listed above (dependent upon the nature of the repairs).
- C. Test for Instrument Constancy

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Instrument constancy means that there is reproducibility, within a stated acceptable degree of precision, in measuring a constant activity over time. Assay at least one relatively long-lived reference source such as Cs-137, Co-57,\*\* or Ra-226\*\* using a reproducible geometry before each day's use of the instrument. Preferably, at least two reference sources (for example, 3-5 mCi of Co-57 and 100-200  $\mu$ Ci of Cs-137 or 1-2 mg Ra-226 (with appropriate decay corrections) will be alternated each day of use to test the instrument's performance over a range of photon energies and source activities.

- Assay each reference source using the appropriate instrument setting (i.e., Cs-137 setting for Cs-137).
- Measure background level at same instrument setting, or check that automatic background subtraction is operating properly when blanks are inserted in the calibrator.

- Calculate net activity of each source subtracting out background level.
- 4. For each source, plot net activity versus the day of the year on semilog graph paper.
- 5. Log the background levels.
- Indicate the predicted activity of each source based on decay calculations and the ±5 percent limits on the graph.
- 7. Repeat the procedure used for the Cs-137 source for all the commonly used radionuclide settings.
- Variations greater than ±5 percent from the predicted activity indicate the need for instrument repair or adjustment.
- 9. Investigate higher than normal background levels to determine their origin and to eliminate them if possible by decontamination, relocation, etc.
- D. Inspect the instrument on a quarterly basis to ascertain that the measurement chamber liner is in place and that instrument zero is properly set (see manufacturer's instructions).
- E. Test of Instrument Linearity

The linearity of a dose calibrator should be ascertained over the entire range of activities employed. This test will use a vial of Tc-99m whose activity is equivalent to the maximum anticipated activity to be assayed (e.g., the first elution from a new generator).

- 1. Assay the Tc-99m vial in the dose calibrator, and subtract background level to obtain net activity in millicuries.
- 2. Repeat step 1 at time intervals of 6, 24, 30, and 48 hours after the initial assay.
- Using the 30-hour activity measurement as a starting point, calculate the predicted activities at 0.
   6, 24, and 48 hours using the following table:

See ANSI N42.13-1978, "Calibration and Usage of Dose Calibrator Ionization Chambers for the Assay of Radionuclides" (American National Standards Institute, Inc., 1430 Broadway, New York, N.Y. 10018).

Cn-57 and Rs-226 are not subject to NRC licensing; the respective State agency should be consulted to determine its requirements for possessing this material.

#### DOSE CALIBRATOR CONSTANCY

1. A quality control test of the dose calibrator is required each day prior to its use to prepare radiopharmaceutical doses.

2. Use the computer generated "DOSE CALIBRATOR CONSTANCY" form to record the observations. Use the 137Cs and 57Co dose calibrator sources in the pharmacy and test each button normally used. For 137Cs, 111In, and 57Co use the following "calibration" dial settings and the "other" button:

| 137Cs | 220 |
|-------|-----|
| 111In | 303 |
| 57Co  | 112 |

For the "moly assay" button use the displayed reading times 3.5 for the observed activity.

3. In addition to the blanks provided on the form perform the following tests and adjust the dose calibrator as needed.

ZERO - With chamber empty, zero the chamber. (voltage offset control)

BACKGROUND - Acceptable range is +/- 0.1 uCi. Record this reading.

TEST - Checks the level of the high voltage battery (normal 151-152)

#### PART 35 • HUMAN USES OF BYPRODUCT MATERIAL

and safety surveys. A licensee is responsible for assuring that any change made is in compliance with the requirements of the regulations and the license.

(b) A licensee shall retain a record of each change until the license has been renewed or terminated. The record must include the effective date of the change, a copy of the old and new radiation safety procedures, the reason for the change, a summary of radiation safety matters that were considered before making the change, the signature of the Radiation Safety Officer, and the signatures of the affected authorized users and of management or, in a medical institution, the Radiation Safety Committee's chairman and the management representative.

## § 35.33 Records and reports of misadministrations.

(a) When a misadministration involves any therapy procedure, the licensee shall notify by telephone the appropriate NRC Regional Office listed in Appendix D of Part 20 of this chapter. The licensee shall also notify the referring physician of the affected patient and the patient or a responsible relative (or guardian), unless the referring physician agrees to inform the patient or believes, based on medical judgment, that telling the patient or the patient's responsible relative (or guardian) would be harmful to one or the other, respectively. These notifications must be made within 24 hours after the licensee discovers the misadministration. If the referring physician, patient, or the patient's responsible relative or guardian cannot be reached within 24 hours, the licensee shall notify them as soon as practicable. The licensee is not required to notify the patient or the patient's responsible relative or guardian without first consulting the referring physician; however, the licensee shall not delay medical care for the patient because of this.

(b) Within 15 days after an initial therapy misadministration report to NRC, the licensee shall report, in writing, to the NRC Regional Office initially telephoned and to the referring physician, and furnish a copy of the report to the patient or the patient's responsible relative (or guardian) if either was previously notified by the licensee under paragraph (a) of this section. The written report must include the licensee's name; the referring physician's name; a brief description of . the event; the effect on the patient; the action-taken to prevent-recurrence; whether the licensee informed the patient or the patient's responsible

relative (or guardian), and if not, why not. The report must not include the patient's name or other information that could lead to identification of the patient.

(c) When a misadministration involves a diagnostic procedure, the Radiation Safety Officer shall promptly investigate its cause, make a record for NRC review, and retain the record as directed in § 35.33(d). The licensee shall also notify the referring physician and the appropriate NRC Office specified in § 30.6 of this part in writing on Form NRC--1 within 15 days if the misadministration involved the use of byproduct material not intended for medical use, administration of a dosage five-fold different from the Intended dosage, or administration of byproduct material such that the patient is likely to receive an organ dose greater than 2 rem or a whole body dose greater than 500 millirem. Licensees may use dosimetry tables in package inserts, corrected only for amount of radioactivity administered, to determine whether a report is required.

(d) Each licensee shall retain a record of each misadministration for ten years. The record must contain the names of all individuals involved in the event (including the physician, allied health personnel, the patient, and the patient's referring physician), the patient's social security number or identification number if one has been assigned, a brief description of the event, the effect on the patient, and the action taken, if any, to prevent recurrence.

(e) Aside from the notification requirement, nothing in this section affects any rights or duties of licensees and physicians in relation to each other, patients, or responsible relatives (or guardians).

#### § 35.49 Suppliers.

A licensee may use for medical use only:

(a) Byproduct material manufactured, labeled, packaged, and distributed in accordance with a license issued pursuant to the regulations in Part 30 and §§ 32.72, 32.73, or 32.74 of this chapter or the equivalent regulations of an Agreement State;

(b) Reagent kits that have been manufactured, labeled, packaged, and distributed in accordance with an approval by the Commission pursuant to § 32.73 or an Agreement State under equivalent regulations for the

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preparation of radiopharmaceuticals for medical use; and

(c) Teletherapy sources manufactured and distributed in accordance with a license issued pursuant to Part 30 of this chapter or the equivalent regulations of an Agreement State.

#### Subpart C—General Technical Requirements

## § 35.50 Possession, use, calibration, and check of dose calibrators.

(a) A medical use licensee authorized to administer radiopharmaceuticals shall have in its possession a dose calibrator and use it to measure the amount of activity administered to each patient.

(b) A licensee shall:

(1) Check each dose calibrator for constancy with a dedicated check source at the beginning of each day of use. To satisfy the requirement of this paragraph, the check must be done on a frequently used setting with a sealed source of not less than 10 microcuries of radium-228 or 50 microcuries of any other photon-emitting radionuclide;

(2) Test each dose calibrator for accuracy upon installation and at least annually thereafter by assaying at least two sealed sources containing different radionuclides whose activity the manufacturer has determined within 5 percent of its stated activity, whose activity is at least 10 microcuries for radium-226 and 50 microcuries for any other photon-emitting radionuclide, and at least one of which has a principal photon energy between 100 keV and 500 keV;

(3) Test each dose calibrator for linearity upon installation and at least quarterly thereafter over the range of its use between the highest dosage that will be administered to a patient and 10 microcuries; and

(4) Test each dose calibrator for geometry dependence upon installation over the range of volumes and volume configurations for which it will be used. The licensee shall keep a record of this test for the duration of the use of the dose calibrator.

(c) A licensee shall also perform appropriate checks and tests required by this section following adjustment or repair of the dose calibrator.

(d) A licensee shall mathematically correct dosage readings for any geometry or linearity error that exceeds 10 percent if the dosage is greater than 10 microcuries and shall repair or replace the dose calibrator if the accuracy or constancy error exceeds 10 percent.

(e) A licensee shall retain a record of each check and test required by this

The staff is developing this form and will make it available before the effective date of this regulation A notice of its availability will be published in the Federal Register.

authorize departures from the manufacturer's instructions for eluting the generator or preparing the therapy kit.

#### Section 30.34 Terms and Conditions of Licenses

Commercial nuclear pharmacies are licensed pursuant to 10 CFR part 30, "Rules of General Applicability to **Domestic Licensing of Byproduct** Material." These licensees are required by a license condition similar to § 35.200(b) to elute generators and prepare reagent kits in accordance with the manufacturer's instructions. The NRC believes that authorized users obtaining radiopharmaceuticals from commercial nuclear pharmacy licensees should not be bound by this restriction in the commercial nuclear pharmacy license. Therefore, the NRC is amending 10 CFR 30.34, "Terms and Conditions of Licenses," to permit actions within the scope of those permitted by the new § 35.200(c). For situations not within the scope of the amended § 30.34, a commercial nuclear pharmacy licensee may file an application to have its license amended to permit specific departures from the manufacturer's instructions for identified products.

Under the interim rule, commercial nuclear pharmacy licensees would no longer be bound by the requirement in their licenses to follow the manufacturer's instructions for a radiopharmaceutical for which the FDA has approved an NDA if they have a written directive made by an authorized user physician directing a specific departure for a particular patient, or patients, or for a radiopharmaceutical, and which includes the specific nature of the departure, a precise description of the departure, and why the departure from the manufacturer's instructions would obtain medical results not otherwise attainable or would reduce medical risks to particular patients because of their medical condition. As in § 35.200(c), there is an exception to the requirement for a written directive before preparing the

radiopharmaceutical in an emergency situation if an authorized user physician determines that a delay in obtaining the written directive would jeopardize the patient's health. In this case, the commercial nuclear pharmacy licensee shall obtain the written directive from the authorized user physician within 3 working days of the prescribed departure. The directive must contain information regarding the emergency and all other required information. Licensees shall keep those records in an auditable form and available for inspection for 5 years. These amendments to § 30.34 take precedence over the restrictive conditions [*i.e.*, on eluting generators and preparing reagent kits for NDA radiopharmaceuticals) in the licenses of commercial nuclear pharmacies. Therefore, those parts of the license conditions no longer apply during the 3year period when the interim rule is in effect. This interim rule does not address departures from IND generator elution instructions or IND protocol directions for reagent kit preparation, thus licensees shall continue to follow the IND instructions.

#### Continuing Applicability of Regulatory Requirements

The NRC notes that this interim rule does not relieve licensees from the requirements to comply with other applicable NRC, FDA; and other Federal or State regulations or NRC orders or license conditions concerning possession or use of byproduct material for medical use or other purposes as specified in 10 CFR parts 30, 32, 33, and 35. Moreover, if a radioactive biologic receives a product license approval (PLA), this interim rule does not authorize departures from the manufacturer's instructions for preparing the biologic. In addition, if a kit or generator for a radiopharmaceutical for therapy receives an approved NDA, this interim rule does not authorize departures from the manufacturer's instructions for eluting the generator or preparing the therapy kit. Neither of these approvals exists at this time and neither is authorized by current regulations.

#### Radiation Safety Responsibilities of Medical Use Licensees

NRC medical use licensees are required by § 35.21 to appoint a Radiation Safety Officer (RSO) responsible for implementing the licensee's radiation safety program. The licensee is required, through the RSO, to ensure that radiation safety activities are being performed in accordance with approved procedures and regulatory, requirements in the daily operation of the licensee's byproduct material program. Nothing in this rulemaking relieves the licensee from complying with the requirements of § 35.21.

In accordance with 10 CFR 35.22, NRC medical institution licensees are required to establish a Radiation Safety Committee (RSC) to oversee the use of byproduct material. The duties of the RSC are specified in § 35.22(b) and include reviews, on the basis of safety, of numerous aspects of a licensee's use of byproduct material. Nothing in this Fulemaking relieves the licensee from complying with the requirements of \$ 35.22.

#### VI. Administrative Statements

#### Finding of No Significant Environmental Impact: Availability

The Commission has determined under the National Environmental Policy Act of 1969, as amended, and the Commission's regulations in subpart A of 10 CFR part 51 that these amendments are not a major Federal action significantly affecting the quality of the human environment and therefore an environmental impact statement is not required. This interim rule amends NRC regulations to permit licensees who elute generators and prepare reagent kits to depart from the manufacturer's instructions if those persons have a written directive made by an authorized user physician that requests a specific departure for a particular patient, or patients, or for a radiopharmaceutical. This directive must provide the specific nature of the departure, a precise description of the departure, and the reasons why the departure from the manufacturer's instructions would obtain medical results, diagnostic or therapeutic, not otherwise attainable or would reduce medical risks to particular patients because of their medical condition. The amendment does not address departures from IND generator elution instructions or IND protocol directions for reagent kit preparation. The NRC is also modifying its regulations to permit, if certain requirements are met, the therapeutic use of radiopharmaceuticals without following the package instructions regarding indications and method of administration. The interim rule does not affect the exemption in 10 CFR part 20 for the intentional exposure of patients to radiation for the purpose of medical diagnosis and therapy.

Although the rule may cause some patients to be exposed to higher or lower levels of radiation than otherwise expected, those exposures would be given to obtain medical results not otherwise attainable or to reduce other risks to the patient. It should be noted that current requirements do not limit the radiation dose prescribed by the authorized user physician for either diagnosis or therapy. The amendments would not relieve licensees from meeting the requirements in 10 CFR parts 20 and 35 that restrict radiation exposure to medical care personnel in the restricted area or to the general public in the unrestricted area, or radioactive effluent releases. It is expected that there would be no

#### MEMORANDUM FOR: Nuclear Medicine Service

5 Feb 91

Subject: Departure from FDA radiopharmaceutical kit preparation and use guidelines to satisfy NRC interim 10 CFR 35.200 requirements.

1. Radiopharmaceuticals will be used in pediatric patients if, in the opinion of the prescribing physician, the benefit of the procedure outweighs the risks from exposure to ionizing radiation. The radiopharmaceutical dose will be determined by the current clinic guideline for pediatric doses.

2. Technetium radiopharmaceutical kits (DTPA, MDP, Sulfur Colloid) prepared in the nuclear pharmacy may be used for an eight hour period from preparation time provided they meet USP radiochemical standards. Tc-DMSA may be used for two hours after preparation provided radiochemical QC is determined to meet USP standards for each dose prepared. The nuclear pharmacist will be responsible for periodically monitoring the radiochemical stability of radiopharmaceutical kits after normal expiration. Preparation of additional kits when the current drug remains useful is an unnecessary expense and exposes personnel to additional radiation.

JAY H. ANDERSON

COL, MC Chief, Nuclear Medicine Svc
#### APPENDIX N

#### Model Procedure for Area Surveys (See § 35.70.)

You may use the following model procedure to perform area surveys. If you willow the model procedure, you may say on your application, "We will establish and implement the model procedure for area surveys that was published in to Regulatory Guide 10.8, Revision 2."

You may develop your own procedure for review. If you do so, you should identified for inclusion all the features in the model procedure and carefully review the requirements of § 35.70. Say on your application, "We have developed mervey procedures for your review that are appended as ATT 10.12," and append mer survey procedures.

#### **COEL** PROCEDURE

#### moient Dose Rate Surveys

- **Survey Areas** 
  - a. In radiopharmaceutical elution, preparation, and administration areas, survey at the end of each day of use with a radiation detection survey meter. If diagnostic administrations are occasionally made in patients' rooms and special care is taken to remove all paraphernalia, those rooms need not be surveyed.
  - b. In laboratory areas where only small quantities of gamma-emitting radioactive material are processed (less than 200 microcuries at a time), survey monthly with a radiation detection survey meter.
  - c. In radiopharmaceutical storage and radiopharmaceutical waste storage areas, survey weekly with a radiation detection survey meter.
  - d. In sealed source and brachytherapy storage areas, survey quarterly with a radiation measurement survey meter.
- Immediately notify the RSO if you find unexpectedly high or low levels.

#### **Len**ovable Contamination Surveys

- 1. Survey Areas
  - a. In radiopharmaceutical elution, preparation, and administration areas, survey weekly for removable contamination. If diagnostic administrations are occasionally made in patients' rooms and special care is taken to remove all paraphernalia, those rooms need not be surveyed.
  - b. In laboratory areas where only small quantities of photon-emitting radioactive material are processed (less than 200 microcuries at a time), survey monthly for removable contamination.

|                                   |                                    | UTHORIZAT               | ION TO USE RAI                                                                | DIOACTIVE                                                                                                       | MATERIAL                         | - HUMAN US                           | SE .                                                       |
|-----------------------------------|------------------------------------|-------------------------|-------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|----------------------------------|--------------------------------------|------------------------------------------------------------|
| APPLICATION<br>(Check and/or c    | FOR:<br>omplete as appropriate)    | NEW AUTH                | ORIZATION: T                                                                  | ENEWAL OF                                                                                                       | IN NUMBER                        | AMENDME                              | NT TO<br>ZATION NUMBE                                      |
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| APPLICANTIS                       | NAME(Prinicipal User):             | ·····                   | APPI                                                                          | H 274                                                                                                           |                                  | Include Omani                        | Tation I.                                                  |
| NEUTZE, JA                        | NIT A. M.D.                        | HAJ, MC                 | Asst                                                                          | Chief                                                                                                           | Nuclear Me                       | dicine Su                            |                                                            |
| ELEPHONE NUM                      | IBER                               |                         | HSHL                                                                          | XN, WRAM                                                                                                        | 7                                | archie Di                            |                                                            |
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| Attach comp WR<br>on file with WR | AMC Form 1643 if not<br>AMC HPO.   |                         | CANTES #/ groue a                                                             |                                                                                                                 | RAD MAT                          | CHNICIANS wh<br>inder this Authority | o will work with<br>prization.                             |
| Abreu, Sue,                       | CPT, MC                            | Ghaed,                  | Victor, COL.                                                                  | MC                                                                                                              |                                  |                                      |                                                            |
| Nordy, Eric                       | , MAJ, MO                          | Radiolo                 | onn A. CUL, M<br>ay Residents                                                 |                                                                                                                 | See a                            | ttached                              | sheet                                                      |
| Neutze .7                         | TANET A. MAJ                       | Student                 | Technicians                                                                   |                                                                                                                 |                                  | •                                    |                                                            |
| Hz, Joseph                        | LTC MG                             | Hagorsk                 | i, Leonard, M                                                                 | AJ, MC                                                                                                          |                                  | , ·                                  |                                                            |
| •                                 |                                    | Oswald,                 | Stephen, MAJ                                                                  | , MC                                                                                                            |                                  |                                      |                                                            |
|                                   |                                    | Fortenb                 | ery, Edwin, C                                                                 | PT, MC                                                                                                          |                                  |                                      |                                                            |
| 1                                 | •<br>•                             | Jerner                  | , James, Cri,                                                                 | TTC                                                                                                             |                                  |                                      |                                                            |
|                                   |                                    |                         |                                                                               |                                                                                                                 |                                  |                                      |                                                            |
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| Rediciso tope                     | 11. Chemical an<br>Physical For    | d/ar                    | l                                                                             |                                                                                                                 |                                  |                                      |                                                            |
|                                   |                                    | m                       | 12. Possession<br>Limit                                                       |                                                                                                                 | U                                | DA                                   | ealed Source                                               |
| See attache<br>Form posses        | d listing of by<br>sion limit date | product ma<br>26 Nov 84 | 12 Possession<br>Limit                                                        | ical and/                                                                                                       | 2 1 JAN                          | 1988<br>ion is given                 | ealed Source                                               |
| ee attache<br>orm posses          | d listing of by<br>sion limit date | product ma<br>26 Nov 84 | 12 Possession<br>Limit<br>terial, chem:<br>MAN<br>DU<br>DU<br>15. CERTIFICATE | ical and/                                                                                                       | 2 1 JAN                          | 1988<br>ion is given<br>of the CO    | ealed Source                                               |

#### HSHL-XN (340a)

19 FEB 91

MEMORANDUM FOR: WRAMC Nuclear Medicine Professional and Technical Staff

SUBJECT: Time Period for cessation of Breast-Feeding after a Nuclear Medicine Procedure

International Council on Radiation Protection (ICRP) publication 52,  $\underline{P_{1}}_{2}$ tection of the Patient in Nuclear Medicine, makes specific suggestions on the time period a nursing mother should cease breast-feeding after a nuclear medicine procedure. Three groups of radiopharmaceuticals used at WRAMC have been identified with different "stop nursing" times:

GROUP I - <u>Stop nursing for at least 3</u> weeks<sup>1</sup>

All 131I - and 125I radiopharmaceuticals except hippuran.

67Ga, 201Tl

GROUP II - <u>Stop nursing for at least 12</u> hours  $^{131I}$ ,  $^{125I}$ , and  $^{123}I$  hippuran

All <sup>99m</sup>Tc-compounds except labelled -RBCs, -phosphonates, and -DTPA

GROUP III - <u>Stop nursing for at least 4</u> hours

All <sup>99m</sup>Tc-RBCs, -phosphonates, and -DTPA

A. ANDERSON

COL, MC Chief, Nuclear Medicine Service

1 This implies normally that nursing will have to be discontinued.

#### WALTER REED ARMY MEDICAL CENTER NUCLEAR MEDICINE SERVICE

#### TO ALL FEMALE PATIENTS BETWEEN 12 AND 55 YEARS OF AGE:

#### Patient's Name (Please print)

Sponsor's Social Security #

#### Study Date:

Like many other x-ray procedures, Nuclear Medicine scans are not usually performed if you have a reasonable chance of being pregnant. To determine this, please answer the following questions.

YES ŃO

 \_\_\_\_\_\_Are you breast feeding?

 \_\_\_\_\_\_Are you post-menopausal (mensutral cycle)?

 \_\_\_\_\_\_Was your last menses (period) within the last 10 days?

 \_\_\_\_\_\_Was your last menses (period) within the last 10 days?

 \_\_\_\_\_\_Was your had a tubal ligation (tubes tied)?

 \_\_\_\_\_\_Wave you had a hysterectomy (uterus removed)?

 \_\_\_\_\_\_Are you on birth control pills (BCP)?

 \_\_\_\_\_\_Do you used an IUD (intra-urine device)?

 \_\_\_\_\_\_Are you pregnant?

or .

# Physician Signature

After consultation with this patient, it is my impression that the likelihood of her being pregnant is small (less than or equal to the likelihood with BCPs/IUD) and does not warrant cancelling or rescheduling the study.

#### Physician's signature

Patient's Signature

#### I-131 CHEST SURVEY PATIENT INFORMATION SHEET

Your Endocrinology or Nuclear Medicine physician has requested an I-131 chest survey which is to localize any remaining thyroid tissue in your neck or chest. This study requires significant preparation and time on your part which should be carefully adhered to for maximum results. This is described below and the total preparation time, scanning time, and if necessary, I-131 treatment time is two months.

Your I-131 chest survey is scheduled for \_\_\_\_\_\_ and if necessary, an
 I-131 treatment will be performed on the subsequent Monday of \_\_\_\_\_\_.

2. Your thyroid hormone (for example Synthroid or desicated thyroid USP) should be discontinued 5 weeks prior to the above date for your I-131 chest survey.

3. Upon discontinuation of the above medication, you should begin Cytomel 25 mcg orally twice daily. Your physician should give you a prescription for such and this should be discontinued 2 weeks prior to the above date for your I-131 chest survey. You will be on no thyroid medication for the last 2 weeks.

4. You should not have any x-ray contrast study (if in doubt ask physician), seafood, iodine containing drugs (SSKI, Lugol's Betadine) for two months prior to study. Your physician may want you to adhere to a low iodine diet during this time and this should be discussed with him.

5. Report to the Nuclear Medicine Clinic at the above appointed time which is usually Monday to have thyroid blood tests drawn and for the oral administration of radioactive iodine. This will take approximately 30 minutes to 1 hour.

7. On the 6th day after you have received the radioactive iodine, report between 0900 and 1400 to the nursing station of the Kyle Metabolic Unit (Ward 47, 4th floor) for final thyroid blood tests.

8. A decision regarding radioactive iodine treatment will be made usually by the following Monday after the images and blood tests are obtained.

a. If treatment is <u>not elected</u>, you will have completed your evaluation. Follow-up I-131 chest survey in 6 months to 1 year should be scheduled before you go home. You should not wait to schedule this! You may begin your thyroid hormone according to the schedule recommended by your primary physician.

b. If low dose treatment is recommended, and if you elect such, then you will be treated at a time convenient to you, the Endocrinology staff and the Nuclear Medicine radiopharmacist. You may begin thyroid medication after the treatment according to the schedule recommended by your primary physician. Usually this is 2-3 days after treatment and may include a brief initial interval on Cytomel as well as thyroxine. In addition, you will be scheduled for a scan 7-10 days after the treatment dose.

Updated September 1985

#### I-131 DOSIMETRY/CHEST SURVEY/TREATMENT PROCEDURE

Your Endocrinologist and Nuclear Medicine physicians have requested a procedure to determine the "treatment dose" of radioactive iodine you should take to treat your thyroid cancer. The procedure estimates the largest dose we can give to destroy thyroid cancer without significantly increasing the risk of radioactive iodine to you. Because the procedure is very important for you and because it is time consuming and complex, it is very important that the procedure be performed as ideally as possible. This requires significant work on your part to assure the best results possible.

A schedule of events is listed on the attached sheet. The column on the left is what you need to do and the column on the right is what the technicians will do. Dates are all determined based on the day you receive your "small tracer dose" of radioactive iodine which is \_\_\_\_\_. Updated September 1985

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| DATE                | DAY    | PATIENT                                                                                                                            | TECHNICIAN                                                                                               |
|---------------------|--------|------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|
|                     | 1+     | Return to Nuclear Medicine<br>Clinic at approximately 1000.<br>Give technician urine bottle                                        | 1. Collect urine bottle #0, label as #0,<br>and store in pharmacy.                                       |
|                     |        | and pick up new urine bottle.                                                                                                      | 2. Give new urine bottle #1.                                                                             |
|                     |        | neasurements of radioactivity<br>in your body taken. Total time<br>in the Nuclear Medicine Clinic<br>should be less than one hour. | 3. Draw 4 cc of heparinized blood. Label<br>tube with patient's name, date, and<br>time and give to lab. |
|                     | 2+     | Same as day 1+.                                                                                                                    | Same as day 1+.                                                                                          |
| ••• •• •• •         |        |                                                                                                                                    |                                                                                                          |
|                     | 3+     | Same as day 1+, however,<br>images of lung and body will<br>be obtained. Anticipate<br>approximately 3 hours.                      | Same as day 1+, however, perform<br>I-131 chest survey as in routine<br>procedure book.                  |
|                     |        |                                                                                                                                    |                                                                                                          |
|                     | 4+     | Same as day 1+.                                                                                                                    | Same as day 1+.                                                                                          |
|                     | 5+     | Same as day 1+.                                                                                                                    | Same as day 1+.                                                                                          |
|                     | 6+     | Same as day 1+.                                                                                                                    | Same as day 1+.                                                                                          |
| 600 - 440 - 440 - 4 | <br>7+ | Same as day 1+.                                                                                                                    | l. Same as day 1+.                                                                                       |
|                     |        |                                                                                                                                    | <ol> <li>Draw PBI-131. Label patient's name,<br/>date, and give to lab.</li> </ol>                       |
|                     |        | · <b></b>                                                                                                                          |                                                                                                          |
|                     |        |                                                                                                                                    |                                                                                                          |
| •                   |        | 4                                                                                                                                  |                                                                                                          |
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|                     |        |                                                                                                                                    |                                                                                                          |
|                     |        |                                                                                                                                    |                                                                                                          |

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DATE DAY

PATIENT

TECHNICIAN

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10+ to 13+

17 +

to

23 +

After computer calculations of data, a dose will be determined and ordered. This time delay is necessary to count blood and urine specimens, calculate data, make decisions, and order the radioactive iodine. You will then be admitted to the hospital. Please read the attached booklet "The Patient's Guide to Iodine I-131 Therapy" explaining treatment in the hospital. Arrive in the AM of the day of admission and plan on staying 5 days. On the day of discharge from the hospital. begin regular diet and thyroid hormone unless notified otherwise. Thyroid hormone should be started according to one of the following schedules (circled), unless notified otherwise:

REGULAR REPLACEMENT: Begin taking the same dose each day that you were on prior to this study.

SLOW REPLACEMENT: Begin taking .05 mg/day for 7 days. Then increase dose to .10 mg/day for 7 more days. Continue to increase dose each week by .05 mg/day until you are taking the same dose you were on prior to this study.

The technician/physician will notify you of a time to return to the Nuclear Medicine Clinic for further lung and body images between the above days. Anticipate 2-3 hours. No injection or blood drawing will be done. Schedule patient at reception desk for a post-treatment I-131 chest survey 7-10 days after treatment. Notify patient of time and day.

Updated September 1985

| DATE | DAY         | PATIENT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | TECHNICIAN                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|------|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|      | -35         | Stop thyroid medication you<br>are on and begin Cytomel one<br>tablet 2 times each day. The<br>prescription is attached. For<br>any other medication, check<br>with your physician. Begin low<br>iodine diet. See booklet of<br>low iodine diet.                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|      | -14         | Stop Cytomel.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|      | -6 or<br>-7 | Come to Nuclear Medicine<br>Clinic between 0800-1500<br>and have blood drawn.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Draw T3RU, T4, TSH and T3RIA<br>(Lab slip attached)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|      |             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|      | Dose        | Come to Nuclear Medicine<br>Clinic by 1000 to receive<br>tracer dose of radioactive<br>iodine. Plan to spend from<br>1000-1200 and from 1400 to<br>1600 in the Nuclear Medicine<br>Clinic. You may eat a light<br>breakfast.<br>After you receive your dose,<br>you must save <u>ALL</u> your urine.<br>You will be given urine<br>bottles to collect urine in,<br>and you should collect all<br>urine for each 24 hour period<br>from noon until noon of the<br>next day in one bottle. At<br>noon the next day, you will<br>turn in the urine bottle.<br>Then begin collecting urine<br>in the new bottle. | <ol> <li>Prepare I-131 radiopharmaceutical<br/>standard. See full procedure.</li> <li>Determine and record exact dose.</li> <li>Dose patient with 5 mCi noting exact<br/>time of administration. Give patient<br/>urine bottle labeled with name, #,<br/>date, and time.</li> <li>Perform uptake probe counts of whole<br/>body at time 0. See full procedure.</li> <li>Give 2 packages of lemon drops or<br/>equivalent to patient.</li> <li>4 hours after dose, draw 5 ml of<br/>heparinized blood. Label tube with<br/>patient name, number, date, time and give<br/>to lab.</li> <li>Perform uptake probe counts at 4 hrs.</li> </ol> |
|      |             | In addition, you will be<br>scheduled for a "post I-131<br>treatment" scan 7-10 days after<br>treatment dose. This is highly<br>recommended as it allows a chest<br>survey to be performed after a<br>large dose of radioactive iodine.<br>One may be able to detect other<br>remaining thyroid tissue which<br>had not previously been noted.                                                                                                                                                                                                                                                               | ۰. ۰. ۰.<br>۱. ۰.<br>(                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

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#### NECK AND CHEST SURVEY CHECKLIST

PRIOR TO DOSING THE PATIENT WITH 1-131, THE FOLLOWING CHECKLIST MUST BE COMPLETED.

\_\_\_1. Lab slip(s) prepared for the following studies. •

TSH THYROGLOBULIN BHCG CBC

2. Patient to lab for blood drawing

3. Pathologist's report in patient's film jacket verifying patient's malignancy and/or extent of previous thyroid surgery. If uncertain, check with O.D. physician.

Technician initials completing checklist

U.D. physician initials

#### IMPORTANT INFORMATION

# DO NOT REFRIGERATE MPI KIDNEY REAGENT

#### (Stannous Dimercaptosuccinic acid)

Ampuls should be checked for discoloration and presence of particulate matter prior to labeling with sodium pertechnetate Tc 99m. Do not use if the solution is discolored or contains particulates.

Small quantities of hydrogen sulfide may be produced from the aqueous dimercaptosuccinic acid (DMSA), resulting in an upleasant odor when the ampul is opened. These small quantities of hydrogen sulfide have not been associated with adverse reactions or alterations in the in vivo distribution of the labeled reagent.

For further information, or to notify Medi-Physics, Inc. of a discolored ampul or one containing particulates, use our toll-free numbers:

OUTSIDE CALIFORNIA: (800) 227-0483 IN CALIFORNIA: (800) 772-2446

#### HSHL-XN (340a)

#### 2 October 1990

SUBJECT: Procedure Manual

The procedures and related information contained in this manual have been reviewed and are found to be accurate and current as of 1 October 1990.

ANDERSON, M.D. COL', MC

C, NUCLEAR MEDICINE SERVICE

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HSHL-XN (340a)

4 APR 91

SUBJECT: Injection of Radiopharmaceuticals

1. The following technologists are authorized to inject patients with radiopharmaceutical materials.

Alugbuo, Charles Bautista, Simon Cranston, Toni Cain, Cheryl Cross, Alberto Cuevas, Angel Dixon, Claudette Dunkle, Wayne Ferguson, Patricia Goldsmith, Donald Greenwood, Valerie Hall, Sharon Kennedy, Kevin Lima-Brunn, Edith Medina, Angel Mullaney, John Roberts, Harriet Rumingan, Wilfredo Warren, Robert Peyton, Elaine Turner, Lynette Sandfer, David Kyle, Ralph Joglekar, Suresh

JAY H. ANDERSON, M.D. COL. MC

C, NUCLEAR MEDICINE SVC

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# **Nuclear Medicine Service**



|                                                                | · · · · · · · · · · · · · · · · · · · |                                                                     |                                                                                                                 |          |
|----------------------------------------------------------------|---------------------------------------|---------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|----------|
| DISPOSITION<br>For use of this form, see AR 340-15; the propon | N FORM                                | n yang berta kasa mengenangkan kasa kasa kasa kasa kasa kasa kasa k | unana a _angangan panamangan nangangan nangangan nangangan nangangan nangangan nangangan nangan nangan nangan n |          |
| REFERENCE OR OFFICE SYMBOL                                     | SUBJECT                               |                                                                     |                                                                                                                 |          |
|                                                                |                                       |                                                                     |                                                                                                                 |          |
| HSHL-XN (340a)                                                 | Authorized                            | Areas for Eatin                                                     | g/Smoking                                                                                                       | ·        |
| TernRU: C, Nuclear Med Svc                                     | FROMchnical D                         | irector DATE                                                        | E 22 JUL 85                                                                                                     | CMT 1    |
|                                                                |                                       |                                                                     | Mr. Kyle/af/6-0168                                                                                              |          |
| TO: All Nuclear Medicine                                       | Personnel                             |                                                                     |                                                                                                                 | ан.<br>Х |
| · · ·                                                          |                                       |                                                                     |                                                                                                                 | •        |
|                                                                | income and an alastance of            | - 1/                                                                | · · · · · · · · · · · · · · · · · · ·                                                                           |          |
| The following areas are des                                    | ignated smoking a                     | nd/or eating ar                                                     | eas as indicated:                                                                                               |          |
| ROOM # AND AREA                                                | Smoki                                 | no Estino                                                           |                                                                                                                 |          |
| KOOH # AND AKHA                                                |                                       | ing Dating                                                          |                                                                                                                 |          |
| #   File room (secretarial                                     | area only) No                         | Yes                                                                 |                                                                                                                 |          |
| # 2 Dose room                                                  | No                                    | No                                                                  |                                                                                                                 |          |
|                                                                | No                                    | No                                                                  |                                                                                                                 |          |
|                                                                | No                                    | Yes                                                                 |                                                                                                                 | 1        |
| # 5 Physics Lab                                                | No                                    | Yes                                                                 |                                                                                                                 |          |
| # 6 Fellows' Office                                            | No                                    | Yes                                                                 |                                                                                                                 | •        |
| # 7 Staff Office                                               | No                                    | Yes                                                                 |                                                                                                                 |          |
| # 8 Staff Office                                               | No                                    | Yes                                                                 |                                                                                                                 | <b>`</b> |
| # 9 Camera Room                                                | No                                    | No                                                                  |                                                                                                                 |          |
| #10 Fellows' Office                                            | No                                    | Yes                                                                 | <del>x</del> .                                                                                                  | 1        |
| <pre>#11 Fellows' Office</pre>                                 | No                                    | No                                                                  |                                                                                                                 |          |
| #12 Fluoro Room                                                | No                                    | Yes                                                                 |                                                                                                                 |          |
| #13 Camera Room                                                | No                                    | No                                                                  |                                                                                                                 |          |
| #14 Camera Room                                                | No                                    | No                                                                  |                                                                                                                 |          |
| #15 Computer Room                                              | No                                    | No                                                                  | ·                                                                                                               |          |
| #16 Short Desk Room                                            | No                                    | Yes                                                                 |                                                                                                                 |          |
| #1/ Camera Room                                                | NO                                    | No                                                                  |                                                                                                                 |          |
| #18 Camera Room                                                | NO                                    | NO                                                                  |                                                                                                                 |          |
| #19 Camera Room                                                | NO                                    | NO                                                                  |                                                                                                                 |          |
| #20 Chief lech s Uffice                                        |                                       | Yes                                                                 |                                                                                                                 |          |
| #21 Technical Director s of $\frac{422}{2}$ Conforman Recm     | NO NO                                 | Ies                                                                 |                                                                                                                 |          |
| 122 Conterence Room                                            | NO<br>No 1                            | ies                                                                 |                                                                                                                 |          |
| T24 Secretary's Office                                         | NO                                    | NO                                                                  |                                                                                                                 |          |
| #25 Long Desk Room                                             | No                                    | Yee                                                                 | •                                                                                                               | ·        |
| Court vard (weather permitt)                                   | ing) Yes                              | Yes                                                                 |                                                                                                                 |          |
| yere (noother permitte                                         |                                       | 200                                                                 | ·                                                                                                               |          |
|                                                                |                                       |                                                                     |                                                                                                                 |          |
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|                                                                | $\Lambda$                             | $\mathbf{b}$                                                        |                                                                                                                 |          |
|                                                                | Cal                                   | M                                                                   |                                                                                                                 |          |

RALPH W. KALE Technical Director Nuclear Medicine Service

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|                                                                                                                                                                                                                                                                                                                                                                              | U.S. NUCLEAR REGUL                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                                                                                                                                                                                                                              | MATERIAL                                                                                                                                                                                   | LS LICENSE Amendment No. 67                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Pursuant to the Atomic Energy Act of 1954, as a<br>Federal Regulations, Chapter I, Parts 30, 31, 32, 3<br>by the licensee, a license is hereby issued authoriz<br>material designated below; to use such material<br>persons authorized to receive it in accordance with<br>specified in Section 183 of the Atomic Energy A<br>Nuclear Regulatory Commission now or hereafte | mended, the Energy R<br>3, 34, 35, 36, 39, 40, as<br>ing the licensee to rece<br>for the purpose(s) and<br>h the regulations of the<br>Act of 1954, as amender<br>r in effect and to any c | Reorganization Act of 1974 (Public Law 93-438), and Title 10, Code of<br>and 70, and in reliance on statements and representations heretofore made<br>eive, acquire, possess, and transfer byproduct, source, and special nuclear<br>at the place(s) designated below; to deliver or transfer such material to<br>eapplicable Part(s). This license shall be deemed to contain the conditions<br>led, and is subject to all applicable rules, regulations, and orders of the<br>conditions specified below. |
| Licensee                                                                                                                                                                                                                                                                                                                                                                     | · · · · · · · · · · · · · · · · · · ·                                                                                                                                                      | In accordance with the application dated                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 1. Department of the Army<br>Walter Reed Army Medical Cent                                                                                                                                                                                                                                                                                                                   | cer (WRAMC)                                                                                                                                                                                | February 28, 1995,<br>3. License Number 08-01738-02 is amended in<br>its entirety to read as follows:                                                                                                                                                                                                                                                                                                                                                                                                       |
| <sup>2.</sup> Washington, D.C. 20307-5001                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                            | 4. Expiration Date June 30, 1999                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                            | 5. Docket or<br>Reference No. 030-01317                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 6. Byproduct, Source, and/or<br>Special Nuclear Material                                                                                                                                                                                                                                                                                                                     | 7. Chemical and<br>Form                                                                                                                                                                    | Vor Physical<br>8. Maximum Amount that Licensee<br>May Possess at Any One Time<br>Under This License                                                                                                                                                                                                                                                                                                                                                                                                        |
| A. Any byproduct material with<br>atomic numbers 1-83                                                                                                                                                                                                                                                                                                                        | A. Any                                                                                                                                                                                     | A. 400 millicuries of each<br>radionuclide with a total<br>possession limit of 26                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <ul> <li>B. Iodine 131</li> <li>C. Xenon 133</li> <li>D. Krypton 85</li> <li>E. Phosphorus 32</li> <li>F. Carbon 14</li> <li>G. Iodine 125</li> <li>H. Iridium 192</li> <li>J. Chromium 51</li> </ul>                                                                                                                                                                        | B. Any<br>C. Any<br>D. Any<br>E. Any<br>F. Any<br>G. Any<br>H. Any<br>I Any                                                                                                                | B. 2 curies<br>B. 2 curies<br>C. 2 curies<br>D. 1 curie<br>E. 2 curies<br>F. 2 curies<br>G. 1 curie<br>H.<br>T50 millicunies                                                                                                                                                                                                                                                                                                                                                                                |
| J. Sulfur 35<br>K. Hydrogen 3<br>L. Molybdenum 99<br>M. Technetium 99m                                                                                                                                                                                                                                                                                                       | J. Any<br>K. Any<br>L. Molybdenu<br>Technetiu<br>Generator<br>M. Any                                                                                                                       | J. 1 curie<br>K. 5 curies<br>L. 23 curies<br>um 99m<br>rs<br>M. 23 curies                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| O. Cesium 137                                                                                                                                                                                                                                                                                                                                                                | N. Sealed so                                                                                                                                                                               | Durces N.<br>Durces O.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Q. Iodine 125                                                                                                                                                                                                                                                                                                                                                                | Q. Sealed so<br>(3M Compa                                                                                                                                                                  | ources Q. 500 millicuries<br>any seeds)                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| R. lodine 125                                                                                                                                                                                                                                                                                                                                                                | R. Sealed so<br>((Norland<br>Model 178<br>Models C2<br>Amersham                                                                                                                            | Durces R. 4 sources, not to exceed<br>d Inst. Co., 300 millicuries each<br>8A591A or AECL<br>235 or C324, or<br>Corp. Medal                                                                                                                                                                                                                                                                                                                                                                                 |
| Information in this record was deleted                                                                                                                                                                                                                                                                                                                                       | IMC.P2)                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Act. exemptions _ Z + C                                                                                                                                                                                                                                                                                                                                                      | - £.                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 2006-0238                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                                                                                                                                                                                                                                                                                                                                                                              | OFFICIAL REC                                                                                                                                                                               | CORD COPY ML 10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| [1_4] 28( 28( 28( 28( 28( 28( 28( 28( 28( 28(                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                            | 24 24 24 24 24 24 24 24 24 24 24 24 24 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

| al (5-8/4)                                                         | U.SEAR REGUL                                                                                                                                                                                                 | ATORY COMMISSION                                                                                                                  |                                                                                                                        | PAGE 2 OF 5                                                                                                                 |
|--------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
|                                                                    | MATEDIALS LICENSE                                                                                                                                                                                            |                                                                                                                                   | License number                                                                                                         | 08-01738-02                                                                                                                 |
|                                                                    | SUPPLEMENTARY SHEET                                                                                                                                                                                          |                                                                                                                                   | Docket or Reference r                                                                                                  | oumber<br>030-01317                                                                                                         |
|                                                                    | · · · · · · · · · · · · · · · · · · ·                                                                                                                                                                        |                                                                                                                                   |                                                                                                                        | Amendment No. 67                                                                                                            |
| (Items 6                                                           | 7. & 8. continued)                                                                                                                                                                                           |                                                                                                                                   |                                                                                                                        |                                                                                                                             |
| 6. Byproduc<br>special                                             | t, source, and/or 7. C<br>nuclear material f                                                                                                                                                                 | hemical and/or<br>orm                                                                                                             | physical 8.                                                                                                            | Maximum amount that<br>licensee may posses<br>any one time under<br>license                                                 |
| S. Cesium<br>T. Cobalt<br>U. Americin<br>V. Americin               | 37       S. S         50       T. S         Im 241       U. A         Im 241       V. S                                                                                                                      | Sealed sources<br>Sealed sources<br>Any<br>Sealed sources                                                                         | S<br>T<br>U<br>V                                                                                                       | 100 microcuries                                                                                                             |
| W. Nickel<br>X. Iodine<br>Y. Thorium<br>Z. Uranium<br>AA. Cesium   | 53<br>29<br>X. S<br>Y. A<br>Z. A<br>137<br>AA.                                                                                                                                                               | Sealed sources<br>Sealed sources<br>Any<br>Any<br>Sealed sour <u>ces</u>                                                          | and foils W<br>X<br>Y<br>Z<br>A                                                                                        | . l curie<br>. l curie<br>. 5 kilograms<br>. 50 kilograms<br>A.                                                             |
| BB. Americ<br>CC. Cesium                                           | ium 241 BB.<br>137 CC.                                                                                                                                                                                       | Sealed sources                                                                                                                    | BI<br>C                                                                                                                | B.<br>C.                                                                                                                    |
| DD. Uraniun<br>Uraniun                                             | n depleted in DD.<br>n 235                                                                                                                                                                                   | Plated Metal                                                                                                                      | D                                                                                                                      | D. 400 Kilograms                                                                                                            |
| 9. Author                                                          | ized use                                                                                                                                                                                                     |                                                                                                                                   |                                                                                                                        |                                                                                                                             |
| A. through<br>DD. Shield                                           | CC. Medical diagnosis, the<br>applicable Food and Di<br>development as defined<br>calibration; student<br>ling in linear accelerators                                                                        | erapy and resea<br>rug Administrat<br>d in 10 CFR 30.<br>instruction.<br>s.                                                       | rch in humans<br>ion (FDA) req<br>4, including                                                                         | in accordance with an<br>uirements. Research a<br>animal studies; instru                                                    |
|                                                                    |                                                                                                                                                                                                              | CONDITIONS                                                                                                                        |                                                                                                                        |                                                                                                                             |
| 10. Locat<br>WRAMC<br>Insti<br>Medica<br>and U<br>Rickma<br>Reseat | ion of use: Walter Reed A<br>Forest Glen Section and A<br>tute of Research Animal Ho<br>al Laboratory, WRAMC Depar<br>S. Army Institute of Dent<br>an Building, 13 Taft Court<br>rch Center, 1413 Research H | rmy Medical Cer<br>nnex, Silver Sp<br>lding Facility,<br>tment of Pathol<br>al Research Fac<br>, Rockville, Ma<br>Boulevard, Rock | iter, Washingt<br>pring, Marylan<br>Fort Meade,<br>ogy, Fort Mea<br>cility, Fort M<br>aryland and Gi<br>(ville, Maryla | on, D. C.;<br>d; Walter Reed Army<br>Maryland; U.S. Army<br>de, Maryland;<br>eade, Maryland;<br>llette Building, 270<br>nd. |
| 11. A.                                                             | icensed material shall be<br>designated in writing by t<br>Chairperson.                                                                                                                                      | used by, or un<br>he Radiation Sa                                                                                                 | nder the super<br>afety Committe                                                                                       | vision of, individuals<br>e, Col. George J. Brow                                                                            |
| В.                                                                 | The use of licensed materi<br>or podiatrist as defined i                                                                                                                                                     | al in or on hun $10 \ \text{CFR} \ 35.2.$                                                                                         | nans shall be                                                                                                          | by a physicían, dentis                                                                                                      |
|                                                                    | C                                                                                                                                                                                                            | $-\chi \propto$                                                                                                                   |                                                                                                                        |                                                                                                                             |

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|        |                                              |                                                                                                                                                                                                                                                                                  |                                                                                       |                                                                    |                                                                      |                                                      | -                                        |                                   |
|--------|----------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|--------------------------------------------------------------------|----------------------------------------------------------------------|------------------------------------------------------|------------------------------------------|-----------------------------------|
| (5-84) | or,m 374A                                    | U.S. EAR REGULATORY COMMISSION                                                                                                                                                                                                                                                   | License number                                                                        | PAGE                                                               | 3                                                                    | OF                                                   | 5                                        | PAGES                             |
| · •    |                                              | MATERIAL CLICENCE                                                                                                                                                                                                                                                                | License number                                                                        | 08-0                                                               | 01738-0                                                              | 02                                                   |                                          |                                   |
|        |                                              | MATERIALS LICENSE<br>SUPPLEMENTARY SHEET                                                                                                                                                                                                                                         | Docket or Referen                                                                     | nce number                                                         |                                                                      |                                                      |                                          |                                   |
|        |                                              | SUIT LEMENTART SHEET                                                                                                                                                                                                                                                             |                                                                                       | 030-                                                               | -01317                                                               |                                                      | •                                        |                                   |
|        |                                              |                                                                                                                                                                                                                                                                                  |                                                                                       | Amer                                                               | ndment                                                               | No.                                                  | 57                                       |                                   |
|        | C.                                           | Physicians, dentists, or podiatrists design<br>on humans shall meet the training criteria<br>and shall be designated in writing by the                                                                                                                                           | gnated to u<br>a establish<br>licensee's                                              | se licen<br>ed in 10<br>Radiat                                     | nsed m<br>) CFR :<br>ion Sa                                          | ateria<br>35, Su<br>fety (                           | al in<br>ubpar<br>Commi                  | or<br>t J<br>ttee                 |
|        | D.                                           | The Radiation Safety Officer for this lice                                                                                                                                                                                                                                       | ense is Col                                                                           | . Willia                                                           | am B                                                                 | Johnso                                               | on.                                      |                                   |
| 12.    | In a<br>the<br>limi<br>emerg                 | ddition to the possession limits in Item 8<br>possession of licensed material at a single<br>ts specified in 10 CFR 30.72 which require<br>gency plan for responding to a release of                                                                                             | , the licen<br>e location<br>considerat<br>licensed ma                                | see sha<br>to quant<br>ion of t<br>terial.                         | ll furi<br>tities<br>the neo                                         | ther<br>below<br>ed fon                              | restr<br>v the<br>r an                   | ict                               |
| 13.    | Notw<br>35.4<br>reag<br>in a<br>10 C<br>Food | ithstanding the requirements of 10 CFR 35.4<br>DO and 35.500 the licensee may use for any<br>ent kit. The licensee shall possess and us<br>coordance with the prescriptive and perfor<br>FR 35. This does not relieve the licensee<br>and Drug Administration (FDA) and other Fo | 19(a) and (1<br>medica] us<br>se byproduc<br>nance crite<br>from comply<br>ederal and | b), 35.<br>e any by<br>t mater<br>ria in t<br>ying wit<br>State re | 100, 3<br>/produc<br>ial for<br>the ot<br>the ot<br>th app<br>equire | 5.200<br>ct mai<br>r med<br>her so<br>licab<br>ments | , 35.<br>teria<br>ical<br>ectio<br>le U. | 300,<br>1 or<br>use<br>ns o<br>S. |
| 14.    | Α.                                           | Detector cells containing a titanium trit<br>shall only be used in conjunction with a<br>mechanism which prevents the foil tempera<br>the certificate of registration referred                                                                                                   | ide foil or<br>properly op<br>tures from<br>to in 10 CF                               | a scand<br>erating<br>exceedin<br>R 32.210                         | dium tr<br>temper<br>ng tha<br>).                                    | ritide<br>rature<br>t spee                           | e foi<br>e con<br>cifie                  | l<br>trol<br>d in                 |
|        | Β.                                           | When in use, detector cells containing a tritide foil shall be vented to the outsid                                                                                                                                                                                              | titanium tr<br>le.                                                                    | itide fo                                                           | oil or                                                               | a sca                                                | andiu                                    | M                                 |
| 15.    | The<br>seal<br>pursi<br>sour                 | licensee shall conduct a physical inventor<br>ed sources and devices containing licensed<br>lant to 10 CFR 35.59, 35.400 and 35.500 and<br>ces and devices.                                                                                                                      | y every thre<br>material re<br>d every six                                            | ee montl<br>eceived<br>months                                      | ns to<br>and po<br>for a                                             | accour<br>ossess<br>11 otl                           | nt fo<br>sed<br>ner s                    | r al<br>eale                      |
| 16.    | Α.                                           | Sealed sources and detector cells contain<br>for leakage and/or contamination at inter-<br>such other intervals as are specified by<br>referred to in 10 CFR 32.210, not to excer                                                                                                | ing license<br>vals not to<br>the certific<br>ed three ye                             | d mater<br>exceed<br>cate of<br>ars.                               | ial sh<br>six m<br>regis                                             | all be<br>onths<br>tratic                            | e tes<br>or a<br>on                      | ted<br>t                          |
|        | Β.                                           | Notwithstanding Paragraph A of this Condi-<br>alpha particles shall be tested for leaka<br>not to exceed three months.                                                                                                                                                           | tion, seale<br>ge and/or c                                                            | d source<br>ontamina                                               | es des<br>ation                                                      | igned<br>at in                                       | to e<br>terva                            | mit<br>ls                         |
|        | C.                                           | In the absence of a certificate from a tra<br>has been made within six months prior to<br>detector cell received from another person<br>tested.                                                                                                                                  | ansferor in<br>the transfe<br>n shall not                                             | dicating<br>r, a sea<br>be put                                     | g that<br>aled so<br>into                                            | a lea<br>ource<br>use un                             | ak te<br>or<br>ntil                      | st                                |
|        | D.                                           | Each sealed source fabricated by the lice<br>construction defects, leakage, and contam<br>a sealed source.                                                                                                                                                                       | nsee shall<br>ination pri                                                             | be insp<br>or to a                                                 | ected<br>ny use                                                      | and to<br>or to                                      | ested<br>ransf                           | for<br>er a                       |
|        | E.                                           | Sealed sources and detector cells need no                                                                                                                                                                                                                                        | t be leak t                                                                           | ested i                                                            | f:                                                                   |                                                      |                                          |                                   |
| •      |                                              | (i) they contain only hydrogen-3; or                                                                                                                                                                                                                                             |                                                                                       |                                                                    |                                                                      | •                                                    |                                          |                                   |

| NRC Fo  |                      |                                                                                                                                                                                                                                   | LEAR REGULATORY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | COMMISSION                                                                                                                                    |                                                                                                                                    |                                                                                                                 | A                                                                                                                            | E.                                                                                           |                            |
|---------|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|----------------------------|
| (5-84), | AP 10 174A           | 0.3.                                                                                                                                                                                                                              | LAN REGULATOR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | COMMISSION                                                                                                                                    | 1 :                                                                                                                                | PAGE                                                                                                            | 4_0F                                                                                                                         | <u>,5</u> P                                                                                  | AGE                        |
|         |                      |                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                               | License number                                                                                                                     | 00 0                                                                                                            | 1720 00                                                                                                                      |                                                                                              |                            |
| · .     |                      | MATERIALS I                                                                                                                                                                                                                       | LICENSE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | -                                                                                                                                             | Dealers D.C.                                                                                                                       | 08-0                                                                                                            | 1/38-02                                                                                                                      |                                                                                              |                            |
|         |                      | SUPPLEMENTAP                                                                                                                                                                                                                      | RY SHEET                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                               | Docket of Referen                                                                                                                  |                                                                                                                 | 01017                                                                                                                        |                                                                                              |                            |
|         |                      |                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | -                                                                                                                                             |                                                                                                                                    | . 030-                                                                                                          | 01317                                                                                                                        |                                                                                              |                            |
|         | ·                    | ·                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                               | 168                                                                                                                                | Amen                                                                                                            | dment No.                                                                                                                    | 67                                                                                           |                            |
|         | (                    | (ii) they contain                                                                                                                                                                                                                 | only a radioad                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | ctive gas;                                                                                                                                    | or                                                                                                                                 |                                                                                                                 |                                                                                                                              | ·                                                                                            |                            |
|         | (`                   | iii) the half-lif                                                                                                                                                                                                                 | e of the isoto                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | pe is 30 da                                                                                                                                   | ys or less                                                                                                                         | ; or                                                                                                            |                                                                                                                              |                                                                                              |                            |
|         | (                    | (iv) they contain<br>material or                                                                                                                                                                                                  | not more than<br>not more than                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 100 microc<br>10 microcur                                                                                                                     | uries of b<br>ies of alp                                                                                                           | eta and/<br>ha emitt                                                                                            | or gamma<br>ing mater                                                                                                        | emittir<br>ial; or                                                                           | ng                         |
|         |                      | (v) they are not<br>being used.<br>transfer to<br>leak test in<br>source or de<br>without bein                                                                                                                                    | designed to en<br>However, when<br>another person<br>terval, they sl<br>tector cell sha<br>og tested for lo                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | mit alpha p<br>they are r<br>, and have<br>hall be tes<br>all be stor<br>eakage and/                                                          | articles,<br>emoved from<br>not been to<br>ted before<br>ed for a po<br>or contami                                                 | are in s<br>n storag<br>ested wi<br>use or<br>eriod of<br>nation.                                               | torage, a<br>e for use<br>thin the<br>transfer.<br>more tha                                                                  | ind are<br>or<br>require<br><b>No se</b><br>in 10 ye                                         | no<br>ed<br>eal<br>ear:    |
|         | F.                   | The test shall be<br>radioactive mater<br>0.005 microcurie<br>with the U.S. Nuc<br>shall be removed<br>disposed of in ac<br>filed within five<br>U.S. Nuclear Regu<br>Safety Branch, 47<br>report shall spec<br>corrective action | capable of devial on the test<br>or more of removed<br>lear Regulatory<br>immediately from<br>cordance with deviate of the<br>days of the deviatory Commiss<br>5 Allendale Ro<br>ify the source<br>of taken.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | tecting the<br>t sample.<br>ovable cont<br>y Commissio<br>om service<br>Commission<br>ate the lea<br>ion, Region<br>ad, King of<br>or detecto | presence<br>If the tes<br>amination,<br>n and the<br>and decont<br>regulation<br>k test res<br>I, ATTN:<br>Prussia,<br>r cell inve | of 0.005<br>t reveal<br>a repor<br>source o<br>aminated<br>s. The<br>ult is k<br>Chief,<br>Pennsylv<br>olved, t | microcur<br>s the pre<br>t shall b<br>r detecto<br>, repaire<br>report sh<br>nown with<br>Nuclear M<br>ania 194<br>he test r | rie of<br>esence of<br>or cell<br>ed, or<br>hall be<br>the<br>laterial<br>06. Th<br>results, | of<br>i<br>ls<br>ne<br>, a |
|         | G.                   | The licensee is a<br>licensee. Altern<br>performed by pers<br>State to perform                                                                                                                                                    | authorized to control | ollect leak<br>for leakag<br>ly licensed                                                                                                      | test samp<br>e and/or c<br>by the Co                                                                                               | les for<br>ontamina<br>mmission                                                                                 | analysis<br>tion may<br>or an Ag                                                                                             | by the<br>be<br>reement                                                                      | t                          |
| 17.     | Seale<br>sourc       | ed sources or dete<br>ces removed from s                                                                                                                                                                                          | ctor cells con<br>ource holders                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | taining lic<br>by the lice                                                                                                                    | ensed mate<br>nsee.                                                                                                                | rial sha                                                                                                        | 11 not be                                                                                                                    | e openeo                                                                                     | i o                        |
| 18.     | The<br>less<br>stora | licensee is author<br>than 65 days and<br>age before disposa                                                                                                                                                                      | rized to hold r<br>Sulfur 35, Cob<br>11 in ordinary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | adioactive<br>alt 58, Iri<br>trash, prov                                                                                                      | material w<br>dium 192,<br>ided:                                                                                                   | ith a ph<br>Scandium                                                                                            | ysical ha<br>46, for                                                                                                         | lf-life<br>decay-i                                                                           | eo<br>in-                  |
|         | Α.                   | Waste to be dispo<br>half-lives.                                                                                                                                                                                                  | osed of in this                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | manner sha                                                                                                                                    | ll be held                                                                                                                         | for dec                                                                                                         | ay a mini                                                                                                                    | mum of                                                                                       | te                         |
|         | Β.                   | Before disposal a<br>surface with the<br>and with no inter<br>distinguished fro<br>obliterated.                                                                                                                                   | as ordinary tra<br>appropriate su<br>posed shieldin<br>om background.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | sh, the was<br>rvey instru<br>g to detern<br>All radiat                                                                                       | te shall b<br>ment set o<br>nine that i<br>tion labels                                                                             | e survey<br>n its mo<br>ts radio<br>shall b                                                                     | ed at the<br>st sensit<br>activity<br>e removed                                                                              | e contat<br>ive sca<br>cannot<br>I or                                                        | ine<br>ale<br>be           |
|         | С.                   | A record of each<br>retained for thre<br>date on which the<br>disposed, the sur                                                                                                                                                   | such disposal<br>ee years. The<br>e byproduct mat<br>rvev instrument                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | permitted u<br>record musi<br>erial was p<br>used the                                                                                         | inder this<br>include t<br>laced in s                                                                                              | License<br>he date<br>torage,<br>dose ra                                                                        | Conditior<br>of dispos<br>the radic<br>te the c                                                                              | n shall<br>sal, the<br>onuclide                                                              | be<br>e<br>es<br>te        |

| NRC For | m 374A                                                                                 | U.S.                                                                                                               |                                                                                                                                  |                                                                                                         |                                                                                                  |                                                                              | <u>Cececece</u>                                                    | S C C C                                        |                         |
|---------|----------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|--------------------------------------------------------------------|------------------------------------------------|-------------------------|
| .(5.84) |                                                                                        |                                                                                                                    |                                                                                                                                  |                                                                                                         | License number                                                                                   | PAGE                                                                         | J OF                                                               | 5                                              | PAGES                   |
|         |                                                                                        | MATERIALS                                                                                                          | LICENSE                                                                                                                          |                                                                                                         | Docket or Refer                                                                                  | 08-01                                                                        | 738-02                                                             |                                                | · · · · ·               |
|         |                                                                                        | SUPPLEMENTA                                                                                                        | RY SHEET                                                                                                                         |                                                                                                         | Docket of Refere                                                                                 | 030-0                                                                        | 1317                                                               |                                                |                         |
|         |                                                                                        |                                                                                                                    |                                                                                                                                  |                                                                                                         |                                                                                                  | Amend                                                                        | ment No.                                                           | 67                                             |                         |
| 19.     | Experimen<br>administe                                                                 | tal animals,<br>red licensed                                                                                       | or the product<br>materials shal                                                                                                 | s from expe<br>l not be us                                                                              | erimental a<br>sed for hum                                                                       | nimals, ti<br>Ian consum                                                     | hat have<br>ption.                                                 | e been                                         |                         |
| 20.     | The licen<br>accordanc<br>10 CFR Pa                                                    | see shall po<br>e with the p<br>rt 35 except                                                                       | ssess and use b<br>rescriptive and<br>sections 35.49                                                                             | oyproduct ma<br>  performanc<br>)(a) and (b)                                                            | terial for<br>ce criteria<br>, 35.100,                                                           | human re<br>in all s<br>35.200, a                                            | search i<br>ections<br>nd 35.30                                    | in<br>of<br>)0.                                |                         |
| 21.     | The licen<br>provision                                                                 | see is autho<br>s of 10 CFR                                                                                        | rized to transp<br>Part 71, "Packa                                                                                               | oort license<br>Iging and Tr                                                                            | ed material<br>ransportati                                                                       | in accord<br>on of Rad                                                       | dance wi<br>ioactive                                               | ith the<br>Mater                               | e<br>rial.'             |
| 22.     | The licen<br>the sourc<br>pursuant                                                     | see shall no<br>e or device<br>to 10 CFR 32                                                                        | t acquire licer<br>has been regist<br>.210 or equival                                                                            | nsed materia<br>cered with t<br>ent regulat                                                             | al in a sea<br>the U.S. Nu<br>tions of an                                                        | led source<br>clear Reg<br>Agreement                                         | e or dev<br>ulatory<br>t State.                                    | vice un<br>Commis                              | nless<br>ssion          |
| 23.     | Radioacti<br>represent<br>licensee'                                                    | ve waste gen<br>ations, and<br>s letter/app                                                                        | erated shall be<br>procedures incl<br>lication dated                                                                             | e stored in<br>uded with f<br>September S                                                               | accordance<br>the waste s<br>), 1993 and                                                         | with the<br>torage pla<br>October a                                          | stateme<br>an descr<br>29, 1993                                    | ents,<br>ibed<br>8.                            | in the                  |
| 24.     | Notwithst<br>contamina<br>accordanc<br>April 8,                                        | anding the r<br>tion in room<br>e with the c<br>1992 and Nov                                                       | equirem <mark>ents of</mark><br>s used to house<br>ommitments and<br>ember 2 <b>4, 1992</b> .                                    | 10 CFR 35.3<br>radiopharn<br>procedures                                                                 | 815(a)(7),<br>maceutical<br>contained                                                            | the licen<br>therapy pa<br>in the le                                         | see may<br>atients<br>tters da                                     | contro<br>in<br>ated                           | 0]                      |
| 25.     | Except as<br>its progr<br>contained<br>changes i<br>The U.S.<br>statement<br>correspon | s specificall<br>ram in accord<br>I in the docu<br>In the medica<br>Nuclear Regu<br>S, represent<br>Indence are mo | y provided othe<br>ance with the s<br>ments, includir<br>l use radiation<br>latory Commissi<br>ations, and pro<br>re restrictive | erwise in the<br>statements,<br>ng any enclo<br>safety pro<br>on's regula<br>ocedures in<br>than the re | nis license<br>representa<br>sures, lis<br>cedures as<br>tions shal<br>the licens<br>egulations. | , the lice<br>tions, and<br>ted below<br>provided<br>l govern d<br>ee's appl | ensee sh<br>d proced<br>, except<br>in 10 C<br>unless t<br>ication | all co<br>lures<br>for r<br>FR 35<br>he<br>and | onduci<br>minor<br>.31. |
| •       | A. Appl<br>B. Lett<br>C. Lett<br>D. Lett<br>E. Lett                                    | lication date<br>ter dated Sep<br>ter dated Oct<br>ter dated Dec<br>ter dated Feb                                  | d January 21, 1<br>tember 9, 1993<br>ober 29, 1993<br>ember 9, 1993<br>ruary 15, 1994                                            | 1993                                                                                                    |                                                                                                  |                                                                              |                                                                    |                                                |                         |
| •<br>•  | r. Lett                                                                                | ler ualed Jun                                                                                                      | e 2, 1994                                                                                                                        |                                                                                                         |                                                                                                  |                                                                              |                                                                    |                                                |                         |
| Date    | JUN -                                                                                  | - 8 1995                                                                                                           |                                                                                                                                  | For the                                                                                                 | e U.S. Nucl<br>Original S<br>Francis N                                                           | ear Regula<br>Signed By:<br>A. Costello                                      | atory Co                                                           | ommiss                                         | ion                     |
|         |                                                                                        |                                                                                                                    |                                                                                                                                  | Nuc<br>Reg<br>Kin                                                                                       | lear Materi<br>ion I<br>g of Prussi                                                              | als Safet<br>a, Pennsy                                                       | y Branch<br>Ivania                                                 | 19406                                          |                         |

# JUN - 8 1995

License No. 08- ©1738-02 Docket No. 030-01317 Control No. 121438

Colonel Peter H. Myers Department of the Army Headquarters, U.S. Army Medical Command 2050 Worth Road/MCHO-CL-W Fort Sam Houston, Texas 78234-6000

Dear Colonel Myers:

This refers to your amendment request dated February 28, 1995 for the abovereferenced license. Enclosed with this letter is the amended license.

Please review the enclosed document carefully and be sure that you understand and fully implement all the conditions incorporated into the amended license. If there are any errors or questions, please notify the U.S. Nuclear Regulatory Commission, Region I office, the Licensing Assistance Section, (610) 337-5093 or 5239, so that we can provide appropriate corrections and answers.

Thank you for your cooperation.

Sincerely,

# **ORIGINAL SIGNED BY:**

Francis M. Costello, Chief Medical Licensing Section Nuclear Materials Safety Branch Division of Radiation Safety and Safeguards

**1**10

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Colonel P.H. Myers Department of the Army

License No. 08- 01738-02 Docket No. 030-01317 Control No. 121438

Enclosures: 1. Amendment No. 67 2. 10 CFR Parts 2, 19, 20, 21, 30, 35, and 71and 170 3. NRC Form 3 and 313

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| DATE   | 05/23/95      |    | 05///95   | 05/ /95 | <br>05/ /95 |

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DEPARTMENT OF THE ARMY HEADQUARTERS, U.S. ARMY MEDICAL COMMAND 2050 WORTH ROAD

FORT SAM HOUSTON, TEXAS 78234-6000



REPLY TO ATTENTION OF February 28, 1995

030-01317

Preventive Medicine and Wellness Division

US Nuclear Regulatory Commission Region I 475 Allendale King of Prussia, Pennsylvania 19406

Dear Sir:

Enclosed are two copies of a request to amend Byproduct Material License Number 08-01738-02, Walter Reed Army Medical Center, Washington, DC. The request for amendment is being submitted to redesignate the Chariman of WRAMC's Radiation Control Committee.

Recommend approval.

Sincerely,

Peter H. Ayers Colonel, U.S. Army Radiological Hygiene Consultant to The Surgeon General

Enclosure

CF: HQ, USAEHA, ATTN: HSHB-MR-H, APG, MD 21010-5422 HQ, USWRAMC, ATTN: HSHL-HP, Wash, DC 20307-5001 (wo/encls)

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121438

MAR - 7 1995



#### DEPARTMENT OF THE ARMY WALTER REED ARMY MEDICAL CENTER WASHINGTON, DC 20307-5001



REPLY TO ATTENTION OF:

#### HSHL-H-HP (385-11m)

22 February 1995

## MEMORANDUM FOR Commander, US Army Medical Command, ATTN: MCHO-CL-W/COL Myers, 2050 Worth Road, Fort Sam Houston, Texas 78234-6000

SUBJECT: Request for Amendment of NRC Commission License Number 08-01738-02

1. Request that Nuclear Regulatory Commission License Number 08-01738-02 issued to Walter Reed Army Medical Center, Washington, D.C., be amended to appoint COL George J. Brown as the new Chairman of the Radiation Control Committee. COL Joan T. Zajtchuk, the previous Chairman named on our License, has departed. COL George J. Brown has replaced COL Zajtchuk. COL Brown is the Deputy Commander for Clinical Services (DCCS). The DCCS position is a senior level executive managements position, one level below the Commander, Walter Reed Army Medical Center (WRAMC). The members of the WRAMC Radiation Control Committee have reviewed COL Brown's curriculum vitae, and have recommended his approval as Chairman. COL Brown's curriculum vitae are enclosed.

2. Any questions or comments pertaining to this request should be directed to COL William B. Johnson, Chief, Health Physics Office, Walter Reed Army Medical Center, Washington DC 20307-5001, at Commercial Phone (301) 427-5161 or DSN 291-5151.

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FOR THE COMMANDER:

MICHAEL P. KOCHEL

LTC, MS Executive Officer

Encl as

121438

MAR - 7 1995

# CURRICULUM VITAE

NAME

PRESENT POSITION

#### **OFFICE ADDRESS**

HOME ADDRESS

DATE and PLACE OF BIRTH

CITIZENSHIP

MARITAL STATUS

LICENSURE

COLLEGE

George Joseph Brown, M.D. Colonel, Medical Corps United States Army

Deputy Commander for Clinical Services Walter Reed Army Medical Center Washington, D.C. 20307-5001

Colonel George J. Brown Deputy Commander for Clinical Services Walter Reed Army Medical Center Washington, D.C. 20307-5001 Phone (202) 782-6394

Hampton Institute Hampton, Virginia

B.A. Degree (Biology)

Curriculum Vites George J. Brown, M.D. July 1, 1994

# MEDICAL SCHOOL

INTERNSHIP

RESIDENCY

FELLOWSHIP

#### CERTIFICATION

MILITARY EDUCATION

Boston University School of Medicine Boston, Massachusetts 7 Ex (e

Fitzsimons Army Medical Center Denver, Colorado Internal Medicine 1 July 1973 - 30 June 1974

Fitzsimons Army Medical Center Denver, Colorado Internal Medicine 1 July 1974 - 30 June 1976

Walter Reed Army Medical Center Washington, D.C. Gastroenterology 1 July 1978 - 30 June 1980

National Board of Medical Examiners - 1974

Certifying Examination - American Board of Internal Medicine - 1976

Certifying Examination - American Board of Internal Medicine (Gastroenterology) - 1981

Graduate

U.S. Army War College Carlisle Barracks Carlisle, PA 17013 June 1991

2

# MEMBERSHIP IN

MILITARY SERVICE

PROFESSIONAL SOCIETIES Member, American College of Physician Executives

Member, American College of Physicians

ROTC Commission, Second Lieutenant United States Army, 1969

Senior Medical Student Program United States Army, 1972-73

Active Duty United States Army, 1972 - Present

#### POSITIONS HELD

September 1972 -May 1973

September 1972 -May 1973

January - June 1976

January - June 1976

1 July 1976 -30 June 1978

1 July 1977 -30 June 1978 President, Boston University Chapter Student National Medical Association

Member, Admissions Committee Boston University School of Medicine

Chief Medical Resident Fitzsimons Army Medical Center Denver, Colorado

Editor, MEDICAL BULLETIN Fitzsimons Army Medical Center Denver, Colorado

Chief, Gastroenterology Section Department of Medicine U.S. Army Medical Department Activity Fort Carson, Colorado

Hospital Epidemiologist U.S. Army Medical Department Activity Fort Carson, Colorado

Curriculum Vitee George J. Brown, M.D. July 1, 1994

June 1979 -June 1980

June 1979 -June 1980

September 1980 -June 1986

June 1981 -May 1986

June 1980 -June 1984

July 1984 -May 1986

1980 - 1984

1984 - 1986

March 1985 -May 1986 Member, Medical Education Committee Walter Reed Army Medical Center Washington, D.C.

Instructor in Medicine Uniformed Services University of the Health Sciences Bethesda, Maryland

Assistant Clinical Professor of Medicine Uniformed Services University of the Health Sciences Bethesda Maryland

Assistant Clinical Professor of Medicine Texas Tech University Health Sciences Center El Paso, Texas

Assistant Chief, Gastroenterology Service William Beaumont Army Medical Center El Paso, Texas

Chief, Gastroenterology Service William Beaumont Army Medical Center El Paso, Texas

Assistant Director Annual William Beaumont Gastrointestinal Symposium William Beaumont Army Medical Center

Director Annual William Beaumont Gastrointestinal Symposium William Beaumont Army Medical Center

Chief, Department of Medicine William Beaumont Army Medical Center El Paso, Texas 79920

Curriculum Vitae George J. Brown, M.D. Revised February 22, 1995

June 1986 -July 1988

1986 - 1988

July 1988 -July 1990

July 1988 -July 1990

June 1989 -July 1990

August 1990 -June 1991

July 1991 -January 1993

February 1993 -January 1995

- February 1995 Present

AWARDS

Internal Medicine Consultant Headquarters, 7th Medical Command Heidelberg, West Germany

Senior Editorial Advisor Medical Bulletin of the US Army Medical Department

Command Surgeon US Command, Berlin West Berlin, Germany

Commanding Officer U.S. Army Hospital West Berlin, Germany

President Berlin International Medical Society West Berlin, Germany

Current Affairs Panel U.S. Army War College Carlisle Barracks, PA

Commanding Officer Letterman Army Institute of Research Presidio of San Francisco, CA 94129

Commanding Officer Blanchfield Army Community Hospital Fort Campbell, KY 42223

Deputy Commander for Clinical Services Walter Reed Army Medical Center Washington, D.C. 20307

Ford Foundation Scholar September 1965 - May 1969

Beta Kappa Chi Scientific Honor Society - January 1968

Experiment in International Living Grant for Foreign Study in England (Genetics) January 1968 - July 1968

5

R.O.T.C. Distinguished Military Student July 1969

R.O.T.C. Distinguished Military Graduate July 1969

Martin Luther King, Jr. Fellow Boston University School of Medicine September 1969 - May 1973

Solomon Carter Fuller Memorial Psychiatry Award Boston University School of Medicine May 1973

Alpha Omega Alpha Honor Medical Society Boston University School of Medicine Chapter January 1973

United States Army Commendation Medal with First Oak Leaf Cluster 1978, 1986

United States Army Achievement Medal with First Oak Leaf Cluster 1985, 1986

Order of Military Medical Merit, 1985

United States Army Meritorious Service Medal with First Oak Leaf Cluster 1986, 1988

United States Army Legion of Merit Medal with First Oak Leaf Cluster 1990, 1993

6

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Curricolud Vite George J. Brown, M.D. July 1, 1994

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#### PUBLICATIONS

Harmon, JW, Johnson, LF, Brown, GJ, Brewer, TG, Berenson, R, Burkhalter, E, and Hirata, R. Nissen Fundoplication for Benign Pediatric Esophageal Stricture. Presented at 10th Annual William Beaumont Gastrointestinal Symposium, 1980

Hallgren, SE and Brown, GJ. Intraoperative Endoscopy as a Diagnostic Tool Military Medicine, 151:400, 1986

Stokes, EW, Oliver, GA, Brown, GJ. Esophageal Cancer: Is Computed Tomography An Accurate Pre-Operative Staging Tool? (1986 AGA Abstract)

Stokes, EW, Washington, E and Brown, GJ. Palliative Neodymium: YAG Laser Therapy for Esophageal Carcinoma: Experience of a Military Medical Center. (1986 AGA Abstract)

Monahan, DW, Poston, WK and Brown, GJ. Mesenteric Panniculitis: Case Report and CT Findings. Southern Medical Journal, 82:782, 1989.

Brown, GJ. The U.S. Automobile Industry: Will It Survive Increasing International Competition. U.S. Army War College Publication, April 1991.

# OFFICIAL RECORD COPY ML 10

Carriculture Vites George J. Brown, M.D., July 1, 1994

#### REFERENCES

Edward F. Coles, M.D., F.A.C.P.

Col. Lawrence F. Johnson, M.D., F.A.C.P.
Professor of Medicine

and Director Digestive Disease Division

Uniformed Services University of the Health Sciences
4301 Jones Bridge Road
Bethesda, Maryland 20814-4799
Tel: (301) 295-360-3606/3607

Col. Howard M. Rosen, M.D. Chief, Gastroenterology Service Dwight David Eisenhower Army Medical Center Fort Gordon Augusta, Georgia 30905 Tel: (404) 791-2157/7646

Melvin L. Butler, M.D., F.A.C.P., F.A.C.P.E.

John S. Gunther, M.D.

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| NAC FORM 374                                                                                                                                                                                                                                                                                                                                  | J.S. NUCLEAR REGULATORY COMMISSIO                                                                                                                                                                                                                                                                                                                                             | N PAGE OF PAGES                                                                                                                                                                                                                                                                                                                                                           |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 <sup>-</sup>                                                                                                                                                                                                                                                                                                                                | MATERIALS LICENSE                                                                                                                                                                                                                                                                                                                                                             | Amendment No. 68                                                                                                                                                                                                                                                                                                                                                          |
| Pursuant to the Atomic Energy Act of 1954,<br>Federal Regulations, Chapter I, Parts 30, 31,<br>by the licensee, a license is hereby issued auth<br>material designated below: to use such mater<br>persons authorized to receive it in accordance<br>specified in Section 183 of the Atomic Ener<br>Nuclear Regulatory Commission now or here | as amended, the Energy Reorganization Act of<br>32, 33, 34, 35, 36, 39, 40, and 70, and in reliance<br>norizing the licensee to receive, acquire, possess,<br>rial for the purpose(s) and at the place(s) design<br>with the regulations of the applicable Part(s). Th<br>gy Act of 1954, as amended, and is subject to<br>eafter in effect and to any conditions specified b | 1974 (Public Law 93-438), and Title 10. Code of<br>on statements and representations heretofore made<br>and transfer byproduct, source, and special nuclear<br>nated below; to deliver or transfer such material to<br>its license shall be deemed to contain the conditions<br>all applicable rules, regulations, and orders of the<br>elow. <b>OFFICIAL RECORD COPY</b> |
| Licensee<br>1 Department of the Army<br>Walter Reed Army Medical C                                                                                                                                                                                                                                                                            | enter (WRAMC)<br>In accorda<br>January 22<br>3. License Numbe<br>its entire                                                                                                                                                                                                                                                                                                   | nce with the letter dated<br>, 1996,<br>¤ 08-01738-02 is amended in<br>ty to read as follows:                                                                                                                                                                                                                                                                             |
| 2.<br>Washington, D.C. 20307-50                                                                                                                                                                                                                                                                                                               | 01 4. Expiration Date                                                                                                                                                                                                                                                                                                                                                         | <sup>3</sup> June 30, 2004                                                                                                                                                                                                                                                                                                                                                |
|                                                                                                                                                                                                                                                                                                                                               | 5. Docket or<br>Reference No.                                                                                                                                                                                                                                                                                                                                                 | 030-01317                                                                                                                                                                                                                                                                                                                                                                 |
| 6. Byproduct, Source, and/or<br>Special Nuclear Material                                                                                                                                                                                                                                                                                      | 7. Chemical and/or Physical<br>Form                                                                                                                                                                                                                                                                                                                                           | 8. Maximum Amount that Licensee<br>May Possess at Any One Time<br>Under This License                                                                                                                                                                                                                                                                                      |
| A. Any byproduct material wi<br>atomic numbers 1-83                                                                                                                                                                                                                                                                                           | th A. Any                                                                                                                                                                                                                                                                                                                                                                     | A. 400 millicuries of each<br>radionuclide with a total<br>possession limit of 26                                                                                                                                                                                                                                                                                         |
| B. Iodine 131<br>C. Xenon 133<br>D. Krypton 85                                                                                                                                                                                                                                                                                                | B. Any<br>C. Any<br>D. Any                                                                                                                                                                                                                                                                                                                                                    | Curies<br>B. 2 curies<br>C. 2 curies<br>D. 1 curie                                                                                                                                                                                                                                                                                                                        |
| E. Phosphorus 32<br>F. Carbon 14<br>C. Lodino 125                                                                                                                                                                                                                                                                                             | E. Any<br>F. Any<br>C. Any                                                                                                                                                                                                                                                                                                                                                    | E. 2 curies<br>F. 2 curies                                                                                                                                                                                                                                                                                                                                                |
| H. Iridium 192<br>I. Chromium 51<br>J. Sulfur 35                                                                                                                                                                                                                                                                                              | H. Any<br>I. Any<br>J. Any                                                                                                                                                                                                                                                                                                                                                    | H.<br>I. 750 millicuries                                                                                                                                                                                                                                                                                                                                                  |
| K. Hydrogen 3<br>L. Molybdenum 99                                                                                                                                                                                                                                                                                                             | K. Any<br>L. Molybdenum 99/<br>Technetium 99m                                                                                                                                                                                                                                                                                                                                 | K. 5 curies<br>L. 23 curies                                                                                                                                                                                                                                                                                                                                               |
| M. Technetium 99m<br>N. Strontium 90<br>O. Cesium 137                                                                                                                                                                                                                                                                                         | Generators<br>M. Any<br>N. Sealed sources<br>O. Sealed sources                                                                                                                                                                                                                                                                                                                | M. 23 curies<br>N.<br>O.                                                                                                                                                                                                                                                                                                                                                  |
| P. Gadolinium 153<br>Q. Iodine 125                                                                                                                                                                                                                                                                                                            | P. Sealed sources<br>Q. Sealed sources<br>(3M Company seeds)                                                                                                                                                                                                                                                                                                                  | P.<br>Q. 500 millicuries                                                                                                                                                                                                                                                                                                                                                  |
| R. Iodine 125                                                                                                                                                                                                                                                                                                                                 | R. Sealed sources<br>((Norland Inst. Co.,<br>Model 178A591A or AECL<br>Models C235 or C324, o<br>Amersham Corp. Model                                                                                                                                                                                                                                                         | R. 4 sources, not to exceed<br>300 millicuries each<br>r                                                                                                                                                                                                                                                                                                                  |
| Information in this record was deleted<br>in accordance with the Freedom of Inform<br>Act, exemptions $2^{-6}$<br>FOLA: $2^{-6}$                                                                                                                                                                                                              | IMC.P2) mation $- \qquad $                                                                                                                                                                                                                             | ML 10 RKby                                                                                                                                                                                                                                                                                                                                                                |

|                                     | Ŧ                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                       | 08-01738-02                                                                                                                                                                                                                                                      |  |
|-------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| MATERIALS SUPPLEMENTA               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | ICENSE<br>Y SHEET                                                                                                                                                                                                                                                                                                                                                                                                      | Docket or Reference Number<br>030-01317                                                                                                                                               |                                                                                                                                                                                                                                                                  |  |
| :                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                       | Amendment No. 68                                                                                                                                                                                                                                                 |  |
| 6. B<br>s                           | Syproduct, source, and/or special nuclear material                                                                                                                                                                                                                                                                                                                                                                                                                                  | 7. Chemical and/or<br>form                                                                                                                                                                                                                                                                                                                                                                                             | physical                                                                                                                                                                              | 8. Maximum amount that<br>licensee may possess at<br>any one time under this<br>license                                                                                                                                                                          |  |
| S. C<br>T. C<br>U. A<br>V. A        | Cesium 137<br>Cobalt 60<br>Americium 241<br>Americium 241                                                                                                                                                                                                                                                                                                                                                                                                                           | S. Sealed sources<br>T. Sealed sources<br>U. Any<br>V. Sealed sources                                                                                                                                                                                                                                                                                                                                                  | •••                                                                                                                                                                                   | S.<br>T.<br>U. 100 microcuries<br>V.                                                                                                                                                                                                                             |  |
| W. N<br>X. 1<br>Y. 1<br>Z. 1<br>AA. | Nickel 63<br>Iodine 129<br>Thorium<br>Uranium<br>Cesium 137                                                                                                                                                                                                                                                                                                                                                                                                                         | W. Sealed sources a<br>X. Sealed sources<br>Y. Any<br>Z. Any<br>AA. Sealed sources                                                                                                                                                                                                                                                                                                                                     | nd foils                                                                                                                                                                              | W. 1 curie<br>X. 1 curie<br>Y. 5 kilograms<br>Z. 50 kilograms<br>AA.                                                                                                                                                                                             |  |
| BB.<br>CC.                          | Americium 241<br>Cesium 137                                                                                                                                                                                                                                                                                                                                                                                                                                                         | BB. Sealed sources<br>CC. Sealed source                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                       | BB.<br>CC.                                                                                                                                                                                                                                                       |  |
| DD.                                 | Uranium depleted in<br>Uranium 235                                                                                                                                                                                                                                                                                                                                                                                                                                                  | DD. Plated Metal                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                       | DD. 400 Kilograms                                                                                                                                                                                                                                                |  |
|                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                       |                                                                                                                                                                                                                                                                  |  |
| 9.                                  | Authorized use                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                       |                                                                                                                                                                                                                                                                  |  |
| 9.<br>A.<br>DD.                     | Authorized use<br>through CC. Medical diagnos<br>applicable Food<br>development as<br>calibration; st<br>Shielding in linear accel                                                                                                                                                                                                                                                                                                                                                  | is, therapy and resear<br>and Drug Administrati<br>defined in 10 CFR 30.4<br>udent instruction.<br>erators.                                                                                                                                                                                                                                                                                                            | ch in human<br>on (FDA) re<br>, including                                                                                                                                             | s in accordance with any<br>quirements. Research and<br>animal studies; instrumer                                                                                                                                                                                |  |
| 9.<br>A.<br>DD.                     | Authorized use<br>through CC. Medical diagnos<br>applicable Food<br>development as<br>calibration; st<br>Shielding in linear accel                                                                                                                                                                                                                                                                                                                                                  | is, therapy and resear<br>and Drug Administrati<br>defined in 10 CFR 30.4<br>udent instruction.<br>erators.<br>CONDITIONS                                                                                                                                                                                                                                                                                              | ch in human<br>on (FDA) re<br>, including                                                                                                                                             | s in accordance with any<br>quirements. Research and<br>animal studies; instrumer                                                                                                                                                                                |  |
| 9.<br>A.<br>DD.<br>10.              | Authorized use<br>Authorized use<br>through CC. Medical diagnos<br>applicable Food<br>development as<br>calibration; st<br>Shielding in linear accel<br>Location of use: Walter<br>WRAMC Forest Glen Section<br>Institute of Research Ani<br>Medical Laboratory, WRAMC<br>and U.S. Army Institute of<br>Rickman Building, 13 Taft<br>Research Center, 1413 Res                                                                                                                      | is, therapy and resear<br>and Drug Administrati<br>defined in 10 CFR 30.4<br>udent instruction.<br>erators.<br>CONDITIONS<br>Reed Army Medical Cent<br>and Annex, Silver Spr<br>mal Holding Facility,<br>Department of Patholo<br>f Dental Research Fac<br>Court, Rockville, Man<br>earch Boulevard, Rockv                                                                                                             | ch in human<br>on (FDA) re<br>, including<br>ing, Maryla<br>Fort Meade,<br>ogy, Fort Me<br>lity, Fort<br>yland and G<br>ville, Maryl                                                  | ton, D. C.;<br>animal studies; instrumer<br>Manyland; U.S. Army<br>eade, Maryland;<br>Meade, Maryland;<br>Aillette Building, 270<br>land.                                                                                                                        |  |
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| 9.<br>A.<br>DD.<br>10.              | Authorized use<br>Authorized use<br>through CC. Medical diagnos<br>applicable Food<br>development as<br>calibration; st<br>Shielding in linear accel<br>Location of use: Walter<br>WRAMC Forest Glen Section<br>Institute of Research Ani<br>Medical Laboratory, WRAMC<br>and U.S. Army Institute of<br>Rickman Building, 13 Taft<br>Research Center, 1413 Res<br>A. Licensed material st<br>designated in writin<br>Chairperson.<br>B. The use of licensed<br>or podiatrist as def | is, therapy and resear<br>and Drug Administrati<br>defined in 10 CFR 30.4<br>udent instruction.<br>erators.<br>CONDITIONS<br>Reed Army Medical Cent<br>and Annex, Silver Spr<br>mal Holding Facility,<br>Department of Patholo<br>f Dental Research Faci<br>Court, Rockville, Man<br>earch Boulevard, Rockw<br>all be used by, or und<br>g by the Radiation Sa<br>material in or on hum<br>fined in 10 CFR 35.2.       | ch in human<br>on (FDA) re<br>, including<br>ing, Maryla<br>Fort Meade,<br>ogy, Fort Me<br>lity, Fort<br>yland and G<br>ville, Maryl<br>ler the supe<br>fety Committe<br>ans shall be | yton, D. C.;<br>animal studies; instrumer<br>animal studies; instrumer<br>Maryland; U.S. Army<br>eade, Maryland;<br>Meade, Maryland;<br>aillette Building, 270<br>land.<br>ervision of, individuals<br>tee, Colonel John R. Pierco<br>e by a physician, dentist, |  |
| 9.<br>A.<br>DD.<br>10.              | Authorized use<br>Authorized use<br>through CC. Medical diagnos<br>applicable Food<br>development as<br>calibration; st<br>Shielding in linear accel<br>Location of use: Walter<br>WRAMC Forest Glen Section<br>Institute of Research Ani<br>Medical Laboratory, WRAMC<br>and U.S. Army Institute of<br>Rickman Building, 13 Taft<br>Research Center, 1413 Res<br>A. Licensed material sh<br>designated in writin<br>Chairperson.<br>B. The use of licensed<br>or podiatrist as def | is, therapy and resear<br>and Drug Administrati<br>defined in 10 CFR 30.4<br>udent instruction.<br>erators.<br>CONDITIONS<br>Reed Army Medical Cent<br>and Annex, Silver Spr<br>mal Holding Facility,<br>Department of Patholo<br>f Dental Research Faci<br>Court, Rockville, Man<br>earch Boulevard, Rockville<br>all be used by, or und<br>g by the Radiation Sat<br>material in or on huma<br>fined in 10 CFR 35.2. | ch in human<br>on (FDA) re<br>, including<br>ing, Maryla<br>Fort Meade,<br>ogy, Fort Me<br>lity, Fort<br>yland and G<br>ville, Maryl<br>ler the supe<br>ety Committe<br>ans shall be  | ton, D. C.;<br>animal studies; instrumer<br>danimal studies; instrumer<br>Maryland; U.S. Army<br>eade, Maryland;<br>Meade, Maryland;<br>aillette Building, 270<br>land.<br>ervision of, individuals<br>tee, Colonel John R. Pierco<br>e by a physician, dentist, |  |

|     |                                                  | MATERIALS LICENSE                                                                                                                                                                                                                                                               | 08-01738-02<br>Docket or Reference Number 01217                                                                                                                                                                                         |
|-----|--------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     |                                                  | SUPPLEMENTARY SHEET                                                                                                                                                                                                                                                             | 030-01317                                                                                                                                                                                                                               |
|     | •<br>                                            |                                                                                                                                                                                                                                                                                 | Amendment No. 68                                                                                                                                                                                                                        |
|     | C.                                               | Physicians, dentists, or podiatrists desig<br>on humans shall meet the training criteria<br>and shall be designated in writing by the                                                                                                                                           | nated to use licensed material in or<br>established in 10 CFR 35, Subpart J<br>licensee's Radiation Safety Committee                                                                                                                    |
|     | D.                                               | The Radiation Safety Officer for this lice                                                                                                                                                                                                                                      | nse is Colonel William B. Johnson.                                                                                                                                                                                                      |
| 12. | In ac<br>the p<br>limit<br>emerg                 | dition to the possession limits in Item 8,<br>ossession of licensed material at a single<br>s specified in 10 CFR 30.72 which require<br>gency plan for responding to a release of 1                                                                                            | the licensee shall further restrict<br>location to quantities below the<br>consideration of the need for an<br>icensed material.                                                                                                        |
| 13. | Notw<br>35.40<br>reage<br>in ac<br>10 Cl<br>Food | thstanding the requirements of 10 CFR 35.4<br>OO and 35.500 the licensee may use for any<br>ent kit. The licensee shall possess and us<br>cordance with the prescriptive and perform<br>FR 35. This does not relieve the licensee<br>and Drug Administration (FDA) and other Fe | 9(a) and (b), 35.100, 35.200, 35.300,<br>medical use any byproduct material or<br>e byproduct material for medical use<br>ance criteria in the other sections o<br>from complying with applicable U.S.<br>deral and State requirements. |
| 14. | Α.                                               | Detector cells containing a titanium triti<br>shall only be used in conjunction with a p<br>mechanism which prevents the foil temperat<br>the certificate of registration referred t                                                                                            | de foil or a scandium tritide foil<br>roperly operating temperature control<br>ures from exceeding that specified in<br>o in 10 CFR 32.210.                                                                                             |
|     | Β.                                               | When in use, detector cells containing a t<br>tritide foil shall be vented to the outsic                                                                                                                                                                                        | itanium tritide foil or a scandium<br>le.                                                                                                                                                                                               |
| 15. | The<br>seal<br>purs<br>sour                      | licensee shall conduct a physical inventory<br>ed sources and devices containing licensed<br>uant to 10 CFR 35.59, 35.400 and 35.500 and<br>ces and devices.                                                                                                                    | v every three months to account for al<br>material received and possessed<br>l every six months for all other seale                                                                                                                     |
| 16. | Α.                                               | Sealed sources and detector cells contain<br>for leakage and/or contamination at interv<br>such other intervals as are specified by<br>referred to in 10 CFR 32.210, not to excee                                                                                               | ing licensed material shall be tested<br>vals not to exceed six months or at<br>the certificate of registration<br>ed three years.                                                                                                      |
|     | Β.                                               | Notwithstanding Paragraph A of this Conditalpha particles shall be tested for leakage not to exceed three months.                                                                                                                                                               | tion, sealed sources designed to emit<br>ge and/or contamination at intervals                                                                                                                                                           |
|     | <b>C.</b>                                        | In the absence of a certificate from a tra<br>has been made within six months prior to<br>detector cell received from another person<br>tested.                                                                                                                                 | ansferor indicating that a leak test<br>the transfer, a sealed source or<br>n shall not be put into use until                                                                                                                           |
|     | D.                                               | Each sealed source fabricated by the lice<br>construction defects, leakage, and contam<br>a sealed source.                                                                                                                                                                      | nsee shall be inspected and tested for<br>ination prior to any use or transfer a                                                                                                                                                        |

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| , <b>NRC</b> РОНМ<br>(7 <del>,</del> 94) | 374A        |                                                                                                                                                          | PAGE 4 OF 5 PAGES                                      |  |  |  |
|------------------------------------------|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|--|--|--|
| • •.                                     |             | MATERIALS LICENSE<br>SUPPLEMENTARY SHEET                                                                                                                 | 08-01/38-02<br>Docket or Reference Number<br>030-01317 |  |  |  |
| · · · · · · · · · · · · · · · · · · ·    |             |                                                                                                                                                          | Amendment No. 68                                       |  |  |  |
| E٠                                       | Seal<br>(i) | ed sources and detector cells need not<br>they contain only hydrogen-3; or                                                                               | be leak tested if:                                     |  |  |  |
|                                          | (ii)        | they contain only a radioactive gas: o                                                                                                                   | r                                                      |  |  |  |
|                                          | (iii)       | the half-life of the isotope is 30 day                                                                                                                   | s or less; or                                          |  |  |  |
| 2<br>21<br>20                            | (iv)        | (iv) they contain not more than 100 microcuries of beta and/or gamma emitting<br>material or not more than 10 microcuries of alpha emitting material; or |                                                        |  |  |  |
|                                          | (v)         | they are not designed to emit alpha pa<br>being used. However, when they are re                                                                          | rticles, are in storage, and are not                   |  |  |  |

- being used. However, when they are removed from storage for use or transfer to another person, and have not been tested within the required leak test interval, they shall be tested before use or transfer. No sealed source or detector cell shall be stored for a period of more than 10 years without being tested for leakage and/or contamination.
- F. The test shall be capable of detecting the presence of 0.005 microcurie of radioactive material on the test sample. If the test reveals the presence of 0.005 microcurie or more of removable contamination, a report shall be filed with the U.S. Nuclear Regulatory Commission and the source or detector cell shall be removed immediately from service and decontaminated, repaired, or disposed of in accordance with Commission regulations. The report shall be filed within five days of the date the leak test result is known with the U.S. Nuclear Regulatory Commission, Region I, ATTN: Chief, Nuclear Materials Safety Branch, 475 Allendale Road, King of Prussia, Pennsylvania 19406. The report shall specify the source or detector cell involved, the test results, and corrective action taken.

- G. The licensee is authorized to collect leak test samples for analysis by the licensee. Alternatively, tests for leakage and/or contamination may be performed by persons specifically licensed by the Commission or an Agreement State to perform such services.
- 17. Sealed sources or detector cells containing licensed material shall not be opened or sources removed from source holders by the licensee.
- 18. The licensee is authorized to hold radioactive material with a physical half-life of less than 65 days and Sulfur 35, Cobalt 58, Iridium 192, Scandium 46, for decay-in-storage before disposal in ordinary trash, provided:
  - A. Waste to be disposed of in this manner shall be held for decay a minimum of ten half-lives.
  - B. Before disposal as ordinary trash, the waste shall be surveyed at the container surface with the appropriate survey instrument set on its most sensitive scale and with no interposed shielding to determine that its radioactivity cannot be distinguished from background. All radiation labels shall be removed or obliterated.

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|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ,    | MATERIALS LICENSE                                                                                                                                                                                                                                                                                                     | U8-U1/38-U2<br>Docket or Reference Number                                                                                                                                                                                                                                            |
|      | SUPPLEMENTARY SHEET                                                                                                                                                                                                                                                                                                   | 030-01317                                                                                                                                                                                                                                                                            |
|      |                                                                                                                                                                                                                                                                                                                       | Amondmont No. 69                                                                                                                                                                                                                                                                     |
|      | · · · · · · · · · · · · · · · · · · ·                                                                                                                                                                                                                                                                                 | Amendment No. 68                                                                                                                                                                                                                                                                     |
|      |                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                      |
|      | C. A record of each such disposal permi<br>retained for three years. The recor<br>date on which the byproduct material<br>disposed, the survey instrument used<br>measured at the surface of each wast<br>who performed the disposal.                                                                                 | tted under this License Condition shall be<br>d must include the date of disposal, the<br>was placed in storage, the radionuclides<br>, the background dose rate, the dose rate<br>e container, and the name of the individual                                                       |
| 19.  | Experimental animals, or the products fro<br>administered licensed materials shall not                                                                                                                                                                                                                                | m experimental animals, that have been<br>be used for human consumption.                                                                                                                                                                                                             |
| 20.  | The licensee shall possess and use byprod<br>accordance with the prescriptive and perf<br>10 CFR Part 35 except sections 35.49(a) a                                                                                                                                                                                   | uct material for human research in<br>ormance criteria in all sections of<br>nd (b), 35.100, 35.200, and 35.300.                                                                                                                                                                     |
| 21.  | The licensee is authorized to transport l<br>provisions of 10 CFR Part 71, "Packaging                                                                                                                                                                                                                                 | icensed material in accordance with the and Transportation of Radioactive Material.                                                                                                                                                                                                  |
| 22.  | The licensee shall not acquire licensed m<br>the source or device has been registered<br>pursuant to 10 CFR 32.210 or equivalent r                                                                                                                                                                                    | aterial in a sealed source or device unless<br>with the U.S. Nuclear Regulatory Commission<br>egulations of an Agreement State.                                                                                                                                                      |
| 23.  | Radioactive waste generated shall be stor<br>representations, and procedures included<br>licensee's letter/application dated Septe                                                                                                                                                                                    | ed in accordance with the statements,<br>with the waste storage plan described in th<br>mber 9, 1993 and October 29, 1993.                                                                                                                                                           |
| 24.  | Notwithstanding the requirements of 10 CF<br>contamination in rooms used to house radi<br>accordance with the commitments and proce<br>April 8, 1992 and November 24, 1992.                                                                                                                                           | R 35.315(a)(7), the licensee may control<br>opharmaceutical therapy patients in<br>dures contained in the letters dated                                                                                                                                                              |
| 25.  | Except as specifically provided otherwise<br>its program in accordance with the statem<br>contained in the documents, including any<br>changes in the medical use radiation safe<br>The U.S. Nuclear Regulatory Commission's<br>statements, representations, and procedur<br>correspondence are more restrictive than | in this license, the licensee shall conduct<br>ents, representations, and procedures<br>enclosures, listed below, except for minor<br>ty procedures as provided in 10 CFR 35.31.<br>regulations shall govern unless the<br>res in the licensee's application and<br>the regulations. |
| · .  | <ul> <li>A. Application dated January 21, 1993</li> <li>B. Letter dated September 9, 1993</li> <li>C. Letter dated October 29, 1993</li> <li>D. Letter dated December 9, 1993</li> <li>E. Letter dated February 15, 1994</li> <li>F. Letter dated June 2, 1994</li> </ul>                                             |                                                                                                                                                                                                                                                                                      |
|      | MAY 28 1996                                                                                                                                                                                                                                                                                                           | Original Signed By                                                                                                                                                                                                                                                                   |
| Date | ΕΕ                                                                                                                                                                                                                                                                                                                    | By Tara Weidner                                                                                                                                                                                                                                                                      |
|      |                                                                                                                                                                                                                                                                                                                       | Nuclear Materials Safety Branch<br>Region I<br>King of Prussia Pennsylvania 19406                                                                                                                                                                                                    |
|      |                                                                                                                                                                                                                                                                                                                       | NING UL FLUSSIA, FEINISYIVANIA 19400                                                                                                                                                                                                                                                 |
| •    |                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                      |

MAY 28 1996

Colonel Eric G. Daxon, Ph.D., CHP Department of the Army Headquarters, U.S. Army Medical Command Preventive Medicine and Wellness Division 2050 Worth Road\MCHO-CL-W Fort Sam Houston, TX 78234-6000

Dear Colonel Daxon:

This refers to your license amendment request. Enclosed with this letter is the amended license. Please note that as part of this amendment, in accordance with 10 CFR 30.36, effective February 15, 1996, the expiration date of your license has been extended by a period of five years. Your new expiration date is stated in Item 4 of the license.

Please review the enclosed document carefully and be sure that you understand and fully implement all the conditions incorporated into the amended license. If there are any errors or questions, please notify the U.S. Nuclear Regulatory Commission, Region I Office, Licensing Assistance Team, (610) 337-5093 or 5239, so that we can provide appropriate corrections and answers.

Thank you for your cooperation.

Sincerely, Original Signed By

Tara Weidner

Tara L. Weidner Division of Nuclear Materials Safety

License No. 08-01738-02 Docket No. 030-01317 Control No. 122993

Enclosure: Amendment No. 68

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DEPARTMENT OF THE ARMY HEADQUARTERS, U.S. ARMY MEDICAL COMMAND 2050 WORTH ROAD FORT SAM HOUSTON, TEXAS 78234-6000



030-01317

REPLY TO ATTENTION OF

#### February 27, 1996

Preventive Medicine and Wellness Division

U.S. Nuclear Regulatory Commission, Region I ATTN: Materials Licensing 475 Allendale Road King of Prussia, PA 1940-1415

Dear Sir or Madam:

Enclosed is a request from the Walter Reed Army Medical Center to amend U.S. Nuclear Regulatory Commission Byproduct Material License No. 08-01738-02.

If you have any questions or need any further assistance please do not hesitate to contact me at (210) 221-6612 or COL Johnson ar (301) 427-5161.

Sincerely

Eric G. Daxon, PhD, CHP Colonel, U.S. Army Radiation Protection Staff Officer

Enclosure

Copies Furnished:

Commander, Walter Reed Army Medical Center, Attention: MCHL-H-HP, Washington, DC 20307-5001 (without enclosure)

Commander, U.S. Army Center for Health Promotion and Preventive Medicine, Attention: MCHB-MR-HM, Aberdeen Proving Ground, Maryland 21010-5422 (with enclosure)

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MAR 1 2 1996



# DEPARTMENT OF THE ARMY WALTER REED ARMY MEDICAL CENTER WASHINGTON, DC 20307-5001



REPLY TO ATTENTION OF:

# MCHL-H-HP (385-11m)

22 January 1996

MEMORANDUM FOR Commander, US Army Medical Command, ATTN: MCHO-CL-W/LTC(P) Daxon, 2050 Worth Road, Fort Sam Houston, Texas 78234-6000

SUBJECT: Request for Amendment of NRC Commission License Number 08-01738-02

1. Request that Nuclear Regulatory Commission License Number 08-01738-02 issued to Walter Reed Army Medical Center, Washington, D.C., be amended to appoint COL John R. Pierce as the new Chairman of the Radiation Control Committee. COL George J. Brown, the previous Chairman named on our License, has departed. COL John R. Pierce has replaced COL Brown. COL Pierce is the Deputy Commander for Clinical Services (DCCS). The DCCS position is a senior level executive management position, one level below the Commander, Walter Reed Army Medical Center (WRAMC). The members of the WRAMC Radiation Control Committee have reviewed COL Pierce's curriculum vitae, and have recommended his approval as Chairman. COL Brown's curriculum vitae are enclosed.

2. Any questions or comments pertaining to this request should be directed to COL William B. Johnson, Chief, Health Physics Office, Walter Reed Army Medical Center, Washington DC 20307-5001, at Commercial Phone (301) 427-5161 or DSN 291-5161.

FOR THE COMMANDER:

Encl

as

Floren yoe n.

JOE N. FLOWERS 2LT, MS Executive Officer

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MAR 1 2 1996

# CURRICULUM VITAE

#### PERSONAL DATA:

Name:

JOHN RANDALL PIERCE, M.D.

#### EDUCATION:

Undergraduate:

B.S. - David Lipscomb College, Nashville, TN,

Postgraduate (Medical):

Medical School: M

Internship:

Residency:

Fellowship:

M.D. - University of Tennessee, Memphis, TN, Tripler Army Medicar Center, Honolulu, HI, 1 Jan - 31 Dec 72 Pediatrics, Tripler Army Medical Center, Honolulu, HI, July 73 - Jun 75 Neonatology, Fitzsimons Army Medical Center, Aurora, CO, Aug 77 - July 79

Postgraduate (Military):

Medical Effects of Nuclear Weapons - 1982 Combat Casualty Care Course - 1983 Command and General Staff College (Commandant's List) - 1985 Medical Management of Chemical Casualties - 1987 Interagency Institute for Federal Health Care Executives - 1988

Encl

General Medical Officer, Atomic Energy Commission Surgery Team, Eniwetok Atoll, Trust Territories of the Pacific, Jan - Feb 1973

#### ACADEMIC APPOINTMENTS:

Associate Professor, Department of Pediatrics, Uniformed Services University of the Health Sciences, 1986 - present

- Assistant Professor (Affiliated), Department of Pediatrics, Uniformed Services University of the Health Sciences, 1981 - 1986
- Assistant Clinical Professor, Department of Pediatrics, University of Colorado Center for Health Sciences, 1981 - 1985 Clinical Instructor, Department of Pediatrics, University of Colorado Center for Health Sciences, 1978 - 1981 Clinical Instructor, Department of Pediatrics, University of Hawaii, 1974 - 1975

# EADERSHIP ACTIVITIES:

ತಷಕ್ಷಿತ್ರೆ ಇತ್ಯಾಗಿತ್ರೆ ...

Chair, OB-GYN Program Director Search Committee for National Capitol Consortium OB-GYN Residency, 1995 President, Uniformed Services Chapter East, American Academy of Pediatrics 1992 - present

> Program Coordinator, 26th Uniformed Services Pediatric Seminar, 1992

Vice-President, Uniformed Services Chapter East, American Academy of Pediatrics 1988 - 1989

Chairman, Pediatric Specialty Group for the Development of a Military Unique Curriculum, Uniformed Services University of the Health Sciences,

Leisli mors aurom 1987 - 1989 - regi

TEL - Ishe Executive Committee, Uniformed Services Ishi NgO TEL) Ishe Section PAmerican Academy of Pediatrics, 1980 - 1983 -1991 - IsheM Shemevernov Varia

### HOSPITAL COMMITTEES



Credentials Committee, Walter Reed Army Medical Center, 1992 - 1995 Chair 1995 - present Professional Education and Training Committee, Walter Reed Army Medical Center, 1992 - 1995 Chair 1995 - present Patient Care Assessment Committee, Walter Reed Army Medical Center, 1992 - 1995 Clinical Space Utilization Committee, Walter Reed Army Medical Center, 1992 - 1995 Education Committee, Fitzsimons Army Medical Center, 1979 - 1985

HONORS:

U.S. Army Surgeon General's "A" Professional Designator, 1986 Order of Military Medical Merit, 1983 Selected Outstanding Staff, Department of Pediatrics by Intern Class, Fitzsimons Army Medical Center, 1982 Selected Outstanding Teacher, Department of Pediatrics by Intern Class, Fitzsimons Army Medical Center, 1981 Selected Outstanding Young Men of America, 1980 Andrew M. Margileth Award for Excellence in Clinical Investigation in Pediatrics, 14th Uniformed Services Pediatric Seminar, 1979

#### MILITARY AWARDS:

Legion of Merit - 1993 Meritorious Service Medal - 1985 Meritorious Service Medal (1st Oak Leaf Cluster) - 1990 Joint Service Commendation Medal - 1989 Army Commendation Medal - 1977 Windshift is ymshaud Army Commendation Medal (1st Oak Leaf Cluster) - 1992 Army Achievement Medal - 1991

Army Achievement Medal (1st Oak Leaf Cluster): --1993 Army Achievement Medal (2nd Oak Leaf Cluster) - 1994 Army Achievement Medal (3nd Oak Leaf Cluster) - 1994 National Defense Medal - 1970, 1991 Humanitarian Service Medal - 1975 Reserve Service Medal - 1981 Overseas Service Ribbon - 1982 Army Service Ribbon - 1982

COMMUNITY ACTIVITIES:

502 J 2 2

#### PUBLICATIONS:

Original Articles

1. Way GL, Pierce JR, Wolfe RR, et al: ST depression suggesting subendocardial ischemia in neonates with respiratory distress syndrome and patent ductus arteriosus, <u>Journal of</u> <u>Pediatrics</u> 95:609-611, 1979.

2. Pierce JR, Merenstein GB: Enteric duplication cyst, <u>American Journal of Diseases of Children</u>, 134:985-986, 1980.

3. Pierce JR, Blake WW, Kilbride HW: Developmental follow-up of military dependents requiring neonatal intensive care. <u>Military</u> <u>Medicine</u> 149:339-341, 1984.

4. Uniformed Services Perinatal-Infectious Disease Group-JR Pierce: Intravenous Immunoglobulin in neonatal group B streptococcal disease. <u>American Journal of Medicine</u> 76:117-121, 1984.

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6. Pierce JR, Merenstein GB, Stocker JT: Immediate postmortem culture in an intensive care nursery. <u>Pediatric Infectious</u> <u>Disease</u> 3:510-513, 1984.

7. Arthur JD, Pierce JR: <u>Citrobacter Diversus</u> meningitis and brain abscess in a neonate associated with <u>Bacteroides</u> <u>Melaninogenicus</u>. <u>Pediatric Infectious Disease</u> 3:592-593, 1984.

8. Nelson SN, Merenstein GB, Pierce JR: Early onset group B streptococcal disease: Is it underdiagnosed? <u>Journal of</u> <u>Perinatology</u> 6:234-238, 1986.

9. Weisman LE, Fischer GW, Marinelli P, Hemming VG, Pierce JR, Golden S, Peck GC: Pharmacokinetics of intravenous immunoglobulin in neonates. <u>Vox Sanguinis</u> 57:243-248, 1989.

10. Callahan CW, Pierce JR: Health Care for the Children of Army Service Members: Cost of Alternatives. <u>Militarv Medicine</u> 156:186-189, 1991.

11. Pierce JR: The role of the Unites States Army active component pediatricians in Operations Desert Shield, Desert Storm and Provide Comfort. <u>Military Medicine</u> 158:105-108, 1993.

#### BOOK CHAPTERS:

1. Pierce JR and Turner BS; Physiologic Monitoring in <u>A</u> <u>Handbook of Neonatal Intensive Care</u>. Merenstein GB and Gardner SL, eds. St.Louis: C.V. Mosby Company, 1985 p. 97-110.

2. Pierce JR and Turner BS; Physiologic Monitoring in <u>A</u> <u>Handbook of Neonatal Intensive Care</u>. Merenstein GB and Gardner SL, eds. St. Louis: C.V. Mosby Company, 1989, p. 126-140.

#### ABSTRACTS:

1. Pierce JR, Merenstein GB: Streptococcal sudden unexpected death syndrome, (Abst) <u>Clinical Research</u> 27:128A, 1979.

2. Kilbride HW, Pierce JR, Merenstein GB: A method for following intranursery and internursery mortality trends, (Abst) <u>Clinical Research</u> 29(1):118A, 1981.

3. Weisman LE, Tunnel S, Stocker T, Pierce JR: Self-limited Hirschsprung's like disease in a very low-birth weight neonate (Abst). March of Dimes Birth Defects Conference, June, 1981.

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4. Weisman LE, Fischer GW, Pierce JR et al: Intravenous immunoglobulin therapy in the neonate: A study of pharmokinetics and safety, (Abst) <u>Pediatric Research</u> 17:341A, 1983.

5. Jannuzzi PJ, Weisman LE, Pierce JR, Garcia V: Abdominal wall erythema associated with Hirschprung's disease, (Abst) 19th Uniformed Services Pediatric Seminar, 1984.

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7. Nelson SN, Pierce JR, Merenstein GB: Is neonatal group B streptococcal disease underreported? (Abst) <u>Clinical Research</u> 33:141A, 1985.

8. Nelson S, Merenstein GB, Pierce JR, Arthur JD, Englekirk P, Morse P: Rapid identification of group B beta-hemolytic streptococci by direct swab micronitrous acid extraction technique, (Abst) 20th Uniformed Services Pediatric Seminar, 1985.

9. Murphy MG, Paine TR, Bonsack T, Arthur JD, Merenstein GB, Pierce JR: Naloxone treatment of streptococcal sepsis in a suckling rat model, (Abst) 21st Uniformed Services Pediatric Seminar, 1986.

10. Carter BS, Anderson BA, Frank CG, Pierce JR: Military neonatologists and bioethical decision making, (Abst) 9th Conference on Military Perinatal Research, 1989.

11. Callahan CW, Pierce JR: The Army Pediatrician: A cost comparison of alternatives for the medical care of dependent children, (Abst) 24th Uniformed Services Pediatric Seminar, 1989.

#### EDITORIALS:

1. Pierce JR, Hemming VG: A case for the military pediatrician. <u>Military Medicine</u> 151:559-560, 1986.

2. Pierce JR, Brennan M, Campbell J, McClurkan M, Morgan JL, Stracner CE: The Department of Military Medicine = A graduate medical education idea whose time has come. <u>Military Medicine</u> 154:536-537, 1989.

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1. Pierce JR, Slaughter JC: Cutis aplasia congentia. <u>American Journal of Diseases of Children</u> 139:1178-1179, 1985.

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2. Pierce JR: In Reply. <u>Military Medicine</u> 155 (Number 5):A6, 1990 and 155 (Number 11):A11, 1990.





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| THE DECISION DECISION DECISIONED                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | TRANKA MACHACINA                                                                                                                                                                                                                                                   | ACTECTECTECTECTECTE                                                                                                                                                                                                      | ACTACIACIACIACIACIACIACIACIACIACIA                                                                                                                                                                                                                                                                                                   |
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| NHC FORA: 374<br>(7-94)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | U.S. NUCLEAR REGL                                                                                                                                                                                                                                                  | JLATORY COMMISSION                                                                                                                                                                                                       | PAGE OF 6_ PAGE                                                                                                                                                                                                                                                                                                                      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | MATERIA                                                                                                                                                                                                                                                            | LS LICENSE                                                                                                                                                                                                               | Amendment No. 69                                                                                                                                                                                                                                                                                                                     |
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|       |                   | C. Physicians, dentists, or podiatrists desi   | gnated to use licensed material in or    |
|       |                   | on humans shall meet the training criteri      | a established in 10 CFR 35, Subpart J    |
|       | ÷                 | and shall be designated in writing by the      | licensee's Radiation Safety Committee.   |
| ·     |                   | D The Dediction Safety Officer for this lie    | once in Colonal William D. Johnson       |
|       |                   | D. The Radiation Safety Utfleer for this lie   | ense is colonel William B. Johnson.      |
|       | 12                | In addition to the possession limits in Item 8 | the licensee shall further restrict      |
|       | 16.               | the possession of licensed material at a singl | e location to quantities below the       |
|       |                   | limits specified in 10 CFR 30.72 which require | consideration of the need for an         |
|       |                   | emergency plan for responding to a release of  | licensed material.                       |
|       |                   |                                                |                                          |
|       | 13.               | Notwithstanding the requirements of 10 CFR 35. | 49(a) and (b), 35.100, 35.200, 35.300,   |
|       |                   | so.you and so.gou the licensee may use for any | medical use any pyproduct material or    |
|       |                   | in accordance with the prescriptive and perfor | mance criteria in the other sections of  |
|       |                   | 10 CFR 35. This does not relieve the licensee  | from complying with applicable U.S.      |
|       |                   | Food and Drug Administration (FDA) and other F | ederal and State requirements.           |
|       | *                 |                                                |                                          |
|       | 14.               | A. Detector cells containing a titanium trit   | ide foil or a scandium tritide foil      |
|       |                   | shall only be used in conjunction with a       | properly operating temperature control   |
|       |                   | mechanism which prevents the foll tempera      | tures from exceeding that specified in   |
| •     |                   | the certificate of registration referred       | LU III IU CFR 32.240.                    |
| .<br> |                   | B. When in use, detector cells containing a    | titanium tritide foil or a scandium      |
|       | * .               | tritide foil shall be vented to the outsi      | de.                                      |
|       | · · ·             |                                                |                                          |
|       | 15.               | The licensee shall conduct a physical inventor | y every three months to account for all  |
|       |                   | sealed sources and devices containing licensed | d avony six months for all other sealed  |
|       |                   | sources and devices                            | a every six months for all other seared  |
|       |                   |                                                |                                          |
|       | 16.               | A. Sealed sources and detector cells contain   | ing licensed material shall be tested    |
|       |                   | for leakage and/or contamination at inter      | vals not to exceed six months or at      |
|       |                   | such other intervals as are specified by       | the certificate of registration          |
|       |                   | referred to in 10 CFR 32.210, not to exce      | ed three years.                          |
|       |                   | B Notwithstanding Paragraph A of this Condi    | tion sealed sources designed to emit     |
|       |                   | alpha particles shall be tested for leaka      | ge and/or contamination at intervals     |
|       |                   | not to exceed three months.                    |                                          |
|       |                   |                                                |                                          |
|       |                   | C. In the absence of a certificate from a tr   | ansferor indicating that a leak test     |
|       |                   | has been made within six months prior to       | the transfer, a sealed source or         |
|       |                   | detector cell received from another perso      | n snall not be put into use until        |
|       |                   | testea.                                        |                                          |
|       |                   | D Each sealed source fabricated by the lice    | nsee shall be inspected and tested for   |
|       |                   | construction defects. leakage and contam       | lination prior to any use or transfer as |
|       |                   | a sealed source.                               |                                          |
|       |                   |                                                |                                          |
|       |                   |                                                |                                          |
|       |                   |                                                |                                          |

| NRS FOI<br>(7-94) | RM 374A        | U.S CLEAR REGULATORY CO                                                | MMISSION PAGE 4 OF 6 PAGES                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-------------------|----------------|------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                   |                |                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| *<br>-            |                | MATERIALS LICENSE                                                      | Docket or Reference Number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|                   |                | SUPPLEMENTARY SHEET                                                    | 030-01317                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|                   |                |                                                                        | Amondment No. CO                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| ·                 |                |                                                                        | Amenament No. 69                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|                   |                |                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                   | E. Sea         | aled sources and detector cells r                                      | need not be leak tested if:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                   |                | they contain only hydrogen 2.                                          | 01                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                   | (1)            | i they contain only hydrogen-5,                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                   | (ii)           | ) they contain only a radioactiv                                       | ve gas; or                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|                   | ,              |                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                   | (111)          | ) the half-life of the isotope i                                       | is 30 days or less; or                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|                   | (iv            | ) they contain not more than 100                                       | ) microcuries of beta and/or gamma emitting                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                   |                | material or not more than 10 m                                         | nicrocuries of alpha emitting material; or                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|                   |                | ) they are not destanted the                                           | alaba antialas and is stars at a sta |
|                   | (V)            | being used. However, when the                                          | arpha particles, are in storage, and are not<br>ev are removed from storage for use or                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|                   |                | transfer to another person, ar                                         | nd have not been tested within the required                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                   |                | leak test interval, they shall                                         | be tested before use or transfer. No seale                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|                   |                | source or detector cell shall                                          | be stored for a period of more than 10 years                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                   | •              | without being tested for leaka                                         | aye anu/or concamination.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|                   | F. The         | e test shall be capable of detect                                      | ting the presence of 0.005 microcurie of                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                   | ra             | dioactive material on the test sa                                      | ample. If the test reveals the presence of                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|                   | U.U<br>wi      | JUS microcurie or more of removal<br>th the U.S. Nuclear Regulatory Co | Die Contamination, a report shall be filed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|                   | sha            | all be removed immediately from s                                      | service and decontaminated, repaired, or                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                   | di             | sposed of in accordance with Comm                                      | nission regulations. The report shall be                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                   | fi             | led within five days of the date                                       | the leak test result is known with the                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| :                 | U<br>د ک       | 5. NUCLEAR REGULATORY COMMISSION,<br>fety Branch 475 Allendale Road    | , Region I, Alin: Unier, Nuclear Materials<br>King of Prussia Pennsylvania 19406 The                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| · · ·             | rej            | port shall specify the source or                                       | detector cell involved, the test results, an                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                   | co             | rrective action taken.                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| ,                 | с ть           | a liconcop is suthenized to coll.                                      | at look toot complete for analysis by the                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|                   | ษ. IN<br>ไป    | e ricensee is authorized to colle<br>censee. Alternatively tests for   | r leakage and/or contamination may be                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| •                 | pe             | rformed by persons specifically 1                                      | licensed by the Commission or an Agreement                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|                   | St             | ate to perform such services.                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 17                | bolcol         | sources or detector cells contain                                      | ing licensed material shall not be opened or                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 1/.               | sources        | removed from source holders by t                                       | the licensee.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|                   |                | · · · · · · · · · · · · · · · · · · ·                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 18.               | The lice       | ensee is authorized to hold radio                                      | pactive material with a physical half-life of                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|                   | storage        | an op days and sultur 35, CODalt<br>before disposal in ordinary trad   | so, iriuium 192, Scandium 46, for decay-in-                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                   | stor aye       | servic arsposar in oralinary tra                                       | ing providedat                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|                   | A. Wa          | ste to be disposed of in this mar                                      | nner shall be held for decay a minimum of ter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|                   | ha             | lf-lives.                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                   | R. Ro          | fore disposal as ordinary trash                                        | the waste shall be surveyed at the container                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                   | SU De          | rface with the appropriate survey                                      | y instrument set on its most sensitive scale                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                   | 54             | d with no interposed shielding to                                      | o determine that its radioactivity cannot be                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                   | an             |                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                   | an<br>di       | stinguished from background. Al                                        | l radiation labels shall be removed or                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|                   | an<br>di<br>ob | stinguished from background. Al<br>literated.                          | l radiation labels shall be removed or                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|                   | an<br>di<br>ob | stinguished from background. Al<br>literated.                          | l radiation labels shall be removed or                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

| NRC FO     | RM 374/                                              | 4                                                                       |                                                                 | 0.50                                                                    | JLEAR F                                                            | REGULA                                                                 | AIOHY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          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|            | C.                                                   | A reco<br>retair<br>date c<br>dispos                                    | rd of<br>ed for<br>n whic<br>ed, th                             | each su<br>three<br>h the b<br>e surve                                  | ich di<br>years<br>yproc<br>y ins                                  | sposa<br>Tł<br>luct n<br>trume                                         | al pe<br>he re<br>matem<br>ent m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               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| 19.        | Exper<br>admin                                       | rimenta<br>nistere                                                      | l anim<br>d lice                                                | als, or<br>nsed ma                                                      | r the<br>ateria                                                    | produ<br>11s sł                                                        | ucts<br>hall                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   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| 20.        | The<br>accor<br>10 C                                 | license<br>rdance<br>FR Part                                            | e shal<br>with t<br>35 ex                                       | l posse<br>he pres<br>cept se                                           | ess ar<br>script<br>ectior                                         | nduse<br>ivea<br>is 35                                                 | e byj<br>and j<br>.49(a                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        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| 21.        | The<br>prov                                          | license                                                                 | eisa<br>of10                                                    | uthoriz<br>CFR Par                                                      | rt 71,                                                             | ) tran<br>"Pac                                                         | nspoi<br>ckagʻ                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 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| 22.        | The<br>the                                           | license<br>source                                                       | e shal<br>or dev                                                | l not a                                                                 | acquir<br>s beer                                                   | reg                                                                    | censo<br>ister                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 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| 23.        | Radi<br>repr<br>lice                                 | oactive<br>esentat<br>nsee's                                            | waste<br>ions,<br>letter                                        | genera<br>and pro<br>/applic                                            | ated s<br>ocedur<br>cation                                         | hall<br>shall<br>ses ir<br>date                                        | be<br>ncluc<br>ed Se                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           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| 23.<br>24. | Radi<br>repr<br>lice<br>Notw<br>cont<br>acco         | oactive<br>esental<br>nsee's<br>ithstar<br>aminat                       | waste<br>ions,<br>letter<br>ding t<br>on in<br>with t           | genera<br>and pro<br>/applic<br>he requ<br>rooms t<br>he comm           | ated s<br>ocedur<br>cation<br>uireme<br>used t                     | ihall<br>res ir<br>date<br>ents c<br>to hou<br>its ar                  | be<br>nclue<br>ed Se<br>of 10<br>use 1<br>nd pi                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                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| 23.<br>24. | Radi<br>repr<br>lice<br>Notw<br>cont<br>acco<br>Apri | oactive<br>esental<br>nsee's<br>ithstar<br>aminati<br>rdance<br>1 8, 19 | waste<br>ions,<br>letter<br>ding t<br>on in<br>with t<br>92 and | genera<br>and pro<br>/applic<br>he requ<br>rooms t<br>he comm<br>Novemb | ated s<br>ocedur<br>cation<br>uireme<br>used t<br>nitmer<br>per 24 | hall<br>res in<br>date<br>ents c<br>co hou<br>its ar<br>1, 199         | be<br>nclud<br>ed Se<br>of 10<br>use 1<br>nd pi<br>92.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         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| 23.<br>24. | Radi<br>repr<br>lice<br>Notw<br>cont<br>acco<br>Apri | oactive<br>esental<br>nsee's<br>ithstar<br>aminati<br>rdance<br>1 8, 19 | waste<br>ions,<br>letter<br>ding t<br>on in<br>with t<br>92 and | genera<br>and pro<br>/applic<br>he requ<br>rooms t<br>he comm<br>Novemb | ated s<br>acedur<br>ation<br>atireme<br>used t<br>nitmer<br>per 24 | hall<br>res ir<br>date<br>ents c<br>co hou<br>its ar<br>, 199          | be<br>nclud<br>ed So<br>of 10<br>use 1<br>nd pi<br>92.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         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| 23.<br>24. | Radi<br>repr<br>lice<br>Notw<br>cont<br>acco<br>Apri | oactive<br>esental<br>nsee's<br>ithstar<br>aminati<br>rdance<br>1 8, 19 | waste<br>ions,<br>letter<br>ding t<br>on in<br>with t<br>92 and | genera<br>and pro<br>/applic<br>he requ<br>rooms t<br>he comm<br>Novemb | ated socedur<br>cation<br>areme<br>used t<br>nitmer<br>per 24      | hall<br>res in<br>date<br>ents c<br>to hou<br>its ar<br>, 199          | be<br>nclud<br>ed Se<br>of 10<br>use 1<br>nd pi<br>92.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         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| 23.        | Radi<br>repr<br>lice<br>Notw<br>cont<br>acco<br>Apri | oactive<br>esental<br>nsee's<br>ithstar<br>aminat<br>rdance<br>1 8, 19  | waste<br>ions,<br>letter<br>ding t<br>on in<br>with t<br>92 and | genera<br>and pro<br>/applic<br>he requ<br>rooms t<br>he comm<br>Novemb | ated s<br>ocedur<br>cation<br>uireme<br>used t<br>nitmen<br>per 24 | hall<br>res in<br>date<br>nts c<br>o hou<br>ts ar<br>, 199             | be :<br>nclud<br>ed Se<br>of 10<br>use i<br>nd pi<br>92.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       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| 23.        | Radi<br>repr<br>lice<br>Notw<br>cont<br>acco<br>Apri | oactive<br>esentat<br>nsee's<br>ithstar<br>aminat<br>rdance<br>1 8, 19  | waste<br>ions,<br>letter<br>ding t<br>on in<br>with t<br>92 and | genera<br>and pro<br>/applic<br>he requ<br>rooms t<br>he comm<br>Novemb | ated socedur<br>cation<br>arreme<br>used t<br>nitmer<br>24         | inall<br>res in<br>date<br>ents c<br>to hou<br>its ar<br>, 199         | be :<br>nclud<br>ed Se<br>of 10<br>use 1<br>nd pi<br>92.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       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| 23.        | Radi<br>repr<br>lice<br>Notw<br>cont<br>acco<br>Apri | oactive<br>esentat<br>nsee's<br>ithstar<br>aminat<br>rdance<br>1 8, 19  | waste<br>ions,<br>letter<br>ding t<br>on in<br>with t<br>92 and | genera<br>and pro<br>/applic<br>he requ<br>rooms t<br>he comm<br>Novemb | ated socedur<br>ation<br>ation<br>sed t<br>nitmen<br>ber 24        | hall<br>res in<br>date<br>ents o<br>to hou<br>its ar<br>, 199          | be<br>nclud<br>ed Se<br>of 10<br>use<br>nd pi<br>92.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           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| 23.        | Radi<br>repr<br>lice<br>Notw<br>cont<br>acco<br>Apri | oactive<br>esental<br>nsee's<br>ithstar<br>aminat<br>rdance<br>1 8, 19  | waste<br>ions,<br>letter<br>ding t<br>on in<br>with t<br>92 and | genera<br>and pro<br>/applic<br>he requ<br>rooms t<br>he comm<br>Novemb | ated socedur<br>cation<br>areme<br>used t<br>nitmen<br>per 24      | equiv<br>hall<br>res in<br>date<br>ents co<br>hou<br>ts ar<br>, 199    | be :<br>nclud<br>ed Se<br>of 10<br>use in<br>nd pi<br>92.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      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| RC FORM 374A   |                               | U.S. N. LEAR         | REGULATORY C                                | OMMISSIÓN             |                                                                                                                 | PAGE      | 6             | OF          | 6         | PAGE  |
|----------------|-------------------------------|----------------------|---------------------------------------------|-----------------------|-----------------------------------------------------------------------------------------------------------------|-----------|---------------|-------------|-----------|-------|
| 90) ·          |                               |                      | •                                           | •                     | License Number                                                                                                  | ~~ ~      | 1.700         |             |           |       |
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| 25. Excep      | t as specific                 | ally provi           | ded otherwi                                 | ise in th             | nis license<br>representa                                                                                       | e, the li | cense         | e sh        | all       | condu |
| conta          | ined in the d                 | locuments,           | including a                                 | any enclo             | sures, lis                                                                                                      | sted belo | w, ex         | cept        | for       | mino  |
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| Ine U<br>state | .S. Nuclear H<br>ments repres | egulatory (equiatory | Lommission                                  | 's regula<br>Tures in | tions shall<br>the licens                                                                                       | l govern  | unie<br>licat | ss t<br>ion | he<br>and |       |
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|                |                               |                      | •                                           |                       | <b>.</b>                                                                                                        |           |               |             |           |       |
| Α.             | Application d                 | lated Janua          | ry 21, 1993                                 | 3 .                   |                                                                                                                 |           |               |             |           |       |
| в.<br>С        | Letter dated                  | September 29         | 9, 1993<br>1993 🕾                           |                       | • •                                                                                                             | ·         | · · ·         |             |           |       |
| D.             | Letter dated                  | December 9           | . 1993                                      | 1 (F) (F)             |                                                                                                                 |           |               |             |           |       |
| Ē.             | Letter dated                  | February 1           | 5, 1994                                     |                       |                                                                                                                 |           |               |             |           |       |
| F.             | Letter dated                  | June 2, 19           | 94                                          |                       |                                                                                                                 |           |               |             |           |       |
| 6.             | Letter daetd                  | December 6           | , 1996                                      |                       |                                                                                                                 | · ·       |               | ÷           |           |       |
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| ,              | MAR 26 19                     | 997                  |                                             |                       | VENCIN.                                                                                                         | ML OIC    |               |             | 1.        |       |
| Date           |                               |                      |                                             | Bv                    | IAHA                                                                                                            | L.VVE     | IUN           |             |           |       |
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| NRC FORM 374                                                                                                                                                                                                                                                                                                   | <u>, ya kana na kata kata kata kata kata kata </u>                                                                                                                                                          |                                                                                                                                                                                            | PAGE 1 OF 6 PAGES                                                                                                                                                                                                                                                                                                                           |  |  |
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|                                                                                                                                                                                                                                                                                                                | J.S. NUCLEAR REGULATO                                                                                                                                                                                       |                                                                                                                                                                                            | Amendment No. 70                                                                                                                                                                                                                                                                                                                            |  |  |
|                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                             |                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                             |  |  |
| of Federal Regulations, Chapter I, Parts 30<br>heretofore made by the licensee, a license is<br>source, and special nuclear material designa<br>deliver or transfer such material to persons auth<br>shall be deemed to contain the conditions sp<br>applicable rules, regulations, and orders of th<br>below. | s amended, the Energy R<br>, 31, 32, 33, 34, 35, 36, 3<br>hereby issued authorizing<br>ated below; to use such m<br>horized to receive it in acco<br>becified in Section 183 of<br>e Nuclear Regulatory Cor | teorganization Act of 19<br>39, 40, and 70, and in r<br>1 the licensee to receive<br>naterial for the purpose<br>ordance with the regula<br>the Atomic Energy Act<br>mmission now or herea | of 4 (Public Law 93-438), and Title 10, Code<br>eliance on statements and representations<br>a, acquire, possess, and transfer byproduct,<br>(s) and at the place(s) designated below; to<br>ations of the applicable Part(s). This license<br>of 1954, as amended, and is subject to all<br>fter in effect and to any conditions specified |  |  |
| Licensee                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                             | In accordance wit                                                                                                                                                                          | h the letter dated                                                                                                                                                                                                                                                                                                                          |  |  |
|                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                             | March 17, 1998,                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                             |  |  |
| 1. Department of the Army                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                             | 3. License number 0                                                                                                                                                                        | 18-01738-02 is amended in                                                                                                                                                                                                                                                                                                                   |  |  |
| Walter Reed Army Medical Center                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                             | is enurely to read                                                                                                                                                                         | as follows:                                                                                                                                                                                                                                                                                                                                 |  |  |
| 2.                                                                                                                                                                                                                                                                                                             | CVF -                                                                                                                                                                                                       | 4. Expiration date Ju                                                                                                                                                                      | une 30, 2004                                                                                                                                                                                                                                                                                                                                |  |  |
| Washington, D.C. 20307-5001                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                             | 5. Docket No. 030-0                                                                                                                                                                        | 01317                                                                                                                                                                                                                                                                                                                                       |  |  |
|                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                             | Reference No.                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                             |  |  |
|                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                             |                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                             |  |  |
| 6. Byproduct, source, and/or special nuclear material                                                                                                                                                                                                                                                          | 7. Chemical and/or p                                                                                                                                                                                        | hysical form                                                                                                                                                                               | <ol> <li>Maximum amount that licensee may<br/>possess at any one time under this<br/>license</li> </ol>                                                                                                                                                                                                                                     |  |  |
| A. Any byproduct material with atomic numbers 1-83                                                                                                                                                                                                                                                             | A. Any                                                                                                                                                                                                      |                                                                                                                                                                                            | <ul> <li>A. 400 millicuries of each<br/>radionuclide with a total<br/>possession limit of 26 curies</li> </ul>                                                                                                                                                                                                                              |  |  |
| B. lodine 131                                                                                                                                                                                                                                                                                                  | B. Any                                                                                                                                                                                                      | B.V                                                                                                                                                                                        | B. 2 curies                                                                                                                                                                                                                                                                                                                                 |  |  |
| C. Xenon 133                                                                                                                                                                                                                                                                                                   | C. Any                                                                                                                                                                                                      |                                                                                                                                                                                            | C 2 curies                                                                                                                                                                                                                                                                                                                                  |  |  |
| D. Krypton 85                                                                                                                                                                                                                                                                                                  | D. Any                                                                                                                                                                                                      |                                                                                                                                                                                            | D. 1 curie                                                                                                                                                                                                                                                                                                                                  |  |  |
| E. Phosphorus 32                                                                                                                                                                                                                                                                                               | E. Any                                                                                                                                                                                                      | × ×                                                                                                                                                                                        | E. 2 curies                                                                                                                                                                                                                                                                                                                                 |  |  |
| F. Carbon 14                                                                                                                                                                                                                                                                                                   | F. Any                                                                                                                                                                                                      |                                                                                                                                                                                            | F. 2 curies                                                                                                                                                                                                                                                                                                                                 |  |  |
| G. lodine 125                                                                                                                                                                                                                                                                                                  | G. Any                                                                                                                                                                                                      |                                                                                                                                                                                            | G. 1 curie                                                                                                                                                                                                                                                                                                                                  |  |  |
| H. Iridium 192                                                                                                                                                                                                                                                                                                 | H. Any                                                                                                                                                                                                      |                                                                                                                                                                                            | н.\                                                                                                                                                                                                                                                                                                                                         |  |  |
| I. Chromium 51                                                                                                                                                                                                                                                                                                 | I. Any                                                                                                                                                                                                      |                                                                                                                                                                                            | I. 750 millicuries                                                                                                                                                                                                                                                                                                                          |  |  |
| J. Sulfur 35                                                                                                                                                                                                                                                                                                   | J. Any                                                                                                                                                                                                      |                                                                                                                                                                                            | J. 1 curie                                                                                                                                                                                                                                                                                                                                  |  |  |
| K. Hydrogen 3                                                                                                                                                                                                                                                                                                  | K. Any                                                                                                                                                                                                      |                                                                                                                                                                                            | K. 5 curies                                                                                                                                                                                                                                                                                                                                 |  |  |
| L. Molybdenum 99                                                                                                                                                                                                                                                                                               | L. Molybdenum 99<br>/ Technetium 99                                                                                                                                                                         | 9/<br>m Generators                                                                                                                                                                         | L. 23 curies                                                                                                                                                                                                                                                                                                                                |  |  |
| M. Technetium 99m                                                                                                                                                                                                                                                                                              | M. Any                                                                                                                                                                                                      | • •                                                                                                                                                                                        | M. 23 curies                                                                                                                                                                                                                                                                                                                                |  |  |
| N. Strontium 90                                                                                                                                                                                                                                                                                                | N. Sealed sources                                                                                                                                                                                           | <b>S</b>                                                                                                                                                                                   | N.\                                                                                                                                                                                                                                                                                                                                         |  |  |
| Information in this record was detered                                                                                                                                                                                                                                                                         | E.                                                                                                                                                                                                          | 2                                                                                                                                                                                          | + KKTV                                                                                                                                                                                                                                                                                                                                      |  |  |
| In accollance with the Freedom of Informate                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                             |                                                                                                                                                                                            | 111/24                                                                                                                                                                                                                                                                                                                                      |  |  |
| FOIA 2006 - 0238                                                                                                                                                                                                                                                                                               | OFFICIAL RECOR                                                                                                                                                                                              | DCOPY                                                                                                                                                                                      | ML10                                                                                                                                                                                                                                                                                                                                        |  |  |

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| NRC FORM 374A                                                         | U.S. NUCLEAR REGULATORY COMMISSION                                | PAGE 2 of 6 PAGES                                                                               |
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|                                                                       |                                                                   | License Number<br>08-01738-02                                                                   |
| MATER                                                                 | ALS LICENSE<br>MENTARY SHEET                                      | Docket or Reference Number<br>030-01317                                                         |
|                                                                       |                                                                   | Amendment No. 70                                                                                |
|                                                                       |                                                                   | •                                                                                               |
| ,                                                                     |                                                                   |                                                                                                 |
| <ol> <li>Byproduct, source, and/or sp<br/>nuclear material</li> </ol> | ecial 7. Chemical and/or physical                                 | form 8. Maximum amount that licensee may<br>possess at any one time under this<br>license       |
| O. Cesium 137                                                         | O. Sealed sources                                                 | 0                                                                                               |
| P. Gadolinium 153                                                     | P. Sealed sources                                                 | P                                                                                               |
| Q. lodine 125                                                         | Q. Sealed sources<br>(3M Company seeds)                           | Q. 1 curie                                                                                      |
| R. lodine 125                                                         | R. Sealed sources<br>((Norland Inst. Co., M<br>178A591A or AECL M | R: 4 sources, not to exceed 300<br>lodel<br>Models                                              |
| 6. Byproduct, source, and/<br>special nuclear material                | or 7. Chemical and/or physical                                    | sical form 8. Maximum amount that licensee<br>may possess at any one time<br>under this license |
| S. Cesium 137                                                         | St Sealed sources                                                 | S.                                                                                              |
| T. Cobalt 60                                                          | Tr. Sealed sources                                                |                                                                                                 |
| U. Americium 241                                                      | U. Any                                                            | U. 100 microcuries                                                                              |
| V. Americium 241                                                      | V. Sealed sources                                                 | V.                                                                                              |
| W. Nickel 63                                                          | W. Sealed sources and                                             | foils W. 1 curie                                                                                |
| X. lodine 129                                                         | X. Sealed sources                                                 | X. 1 curie                                                                                      |
| Y. Thorium                                                            | Y. Any                                                            | Y. 5 kilograms                                                                                  |
| Z. Uranium                                                            | Z. Any                                                            | Z. 50 kilograms                                                                                 |
| AA. Cesium 137                                                        | AA <u>.</u> Sealed sources                                        | AA                                                                                              |
| BB. Americium 241                                                     | BB. Sealed sources                                                | BB                                                                                              |
| CC. Cesium 137                                                        | CC. Sealed source                                                 | CC                                                                                              |
|                                                                       |                                                                   | a manual                                                                                        |
| DD. Paladium 103                                                      | DD. Sealed sources                                                | DD. 3 curies                                                                                    |
|                                                                       | Ex 2                                                              |                                                                                                 |

| NRC        | FORM 374A                                                                                                                  | U.S. NUCLEAR REGULATORY COMMISS                                                                                                            | NON PAGE 3 of 6 PAGES                                                                                                                                                                                 |
|------------|----------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|            |                                                                                                                            |                                                                                                                                            | License Number<br>08-01738-02                                                                                                                                                                         |
|            | MATER<br>SUPPLE                                                                                                            | IALS LICENSE<br>MENTARY SHEET                                                                                                              | Docket or Reference Number<br>030-01317                                                                                                                                                               |
|            |                                                                                                                            |                                                                                                                                            | Amendment No. 70                                                                                                                                                                                      |
| <u>.</u>   |                                                                                                                            | <u> </u>                                                                                                                                   |                                                                                                                                                                                                       |
| <b>6</b> . | Byproduct, source, and/or sp<br>nuclear material                                                                           | pecial 7. Chemical and/or phys                                                                                                             | sical form 8. Maximum amount that licensee may<br>possess at any one time under this<br>license                                                                                                       |
| EE.        | Uranium depleted in<br>Uranium 235                                                                                         | EE. Plated Metal                                                                                                                           | EE. 400 Kilograms                                                                                                                                                                                     |
| 9.         | Authorized use:                                                                                                            |                                                                                                                                            | - GU/                                                                                                                                                                                                 |
| A. th      | nrough DD. Medi<br>Food<br>defin<br>instru                                                                                 | cal diagnosis, therapy and reseau<br>and Drug Administration (FDA) u<br>ed in 10 CFR 30.4, including anir<br>action.                       | rch in humans in accordance with any applicable<br>requirements. Research and development as<br>mal studies; instrument calibration; student                                                          |
| EE.        | Shielding in linear acce                                                                                                   | lerators                                                                                                                                   |                                                                                                                                                                                                       |
|            |                                                                                                                            |                                                                                                                                            |                                                                                                                                                                                                       |
|            |                                                                                                                            |                                                                                                                                            |                                                                                                                                                                                                       |
| 10.        | Licensed material may<br>Center, Washington, D<br>Medical Laboratory, W<br>Court, Rockville, Maryl<br>Rockville, Maryland. | be used only at the licensee's far<br>.C.; WRAMC Forest Glen Section<br>RAMC Department of Pathology,<br>and and Gillette Building, 270 Re | cilities located at the Walter Reed Army Medical<br>on and Annex, Silver Spring, Maryland; U.S. Army<br>Fort Meade, Maryland; Rickman Building, 13 Taft<br>search Center, 1413 Research Boulevard,    |
| 11.        | A. Licensed material the Radiation Safe                                                                                    | shall be used by, or under the su<br>ty Committee, Colonel John R. F                                                                       | pervision of, individuals designated in writing by<br>Pierce, Chairperson.                                                                                                                            |
|            | B. The use of license in 10 CFR 35.2.                                                                                      | ed material in or on humans shall                                                                                                          | be by a physician, dentist, or podiatrist as defined                                                                                                                                                  |
|            | C. Physicians, dentis<br>the training criteria<br>licensee's Radiation                                                     | ts, or podiatrists designated to us<br>a established in 10 CFR 35, Subp<br>on Safety Committee.                                            | se licensed material in or on humans shall meet<br>part J and shall be designated in writing by the                                                                                                   |
|            | D. The Radiation Sat                                                                                                       | ety Officer for this license is Colo                                                                                                       | onel William B. Johnson.                                                                                                                                                                              |
| 12.        | In addition to the posse<br>material at a single loc<br>consideration of the ne                                            | ession limits in Item 8, the license<br>ation to quantities below the limits<br>ed for an emergency plan for res                           | e shall further restrict the possession of licensed<br>s specified in 10 CFR 30.72 which require<br>ponding to a release of licensed material.                                                        |
| 13.        | Notwithstanding the re<br>the licensee may use f<br>possess and use bypro<br>criteria in the other sec                     | quirements of 10 CFR 35.49(a) a<br>or any medical use any byproduc<br>oduct material for medical use in<br>tions of 10 CFR 35. This does n | nd (b), 35.100, 35.200, 35.300, 35.400 and 35.500<br>t material or reagent kit. The licensee shall<br>accordance with the prescriptive and performance<br>ot relieve the licensee from complying with |

| NRC | FOR                | M 374A                        | U.S. NUCLEAR REGULATORY COMMISSION                                                                                                                                                                                                                                | PAGE 4 of 6 PAGES                                                                                                                                                                         |
|-----|--------------------|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     |                    |                               |                                                                                                                                                                                                                                                                   | License Number<br>08-01738-02                                                                                                                                                             |
|     |                    |                               | MATERIALS LICENSE<br>SUPPLEMENTARY SHEET                                                                                                                                                                                                                          | Docket or Reference Number<br>030-01317                                                                                                                                                   |
|     |                    |                               |                                                                                                                                                                                                                                                                   | Amendment No. 70                                                                                                                                                                          |
|     |                    | <u> </u>                      | waa ahaa ahaa ahaa ahaa ahaa ahaa ahaa                                                                                                                                                                                                                            |                                                                                                                                                                                           |
|     | app                | licable                       | e U.S. Food and Drug Administration (FDA) and of                                                                                                                                                                                                                  | ther Federal and State requirements.                                                                                                                                                      |
| 14. | A.                 | Dete<br>conju<br>temp<br>32.2 | ctor cells containing a titanium tritide foil or a scan<br>unction with a properly operating temperature contr<br>peratures from exceeding that specified in the certi-<br>10.                                                                                    | dium tritide foil shall only be used in<br>rol mechanism which prevents the foil<br>ficate of registration referred to in 10 CFR                                                          |
|     | В.                 | Whe<br>the c                  | n in use, detector cells containing a titanium tritide<br>outside.                                                                                                                                                                                                | foil or a scandium tritide foil shall be vented to                                                                                                                                        |
| 15. | The<br>dev<br>35.5 | icen<br>ices c<br>500 ar      | see shall conduct a physical inventory every three<br>ontaining licensed material received and possessen<br>nd every six months for all other sealed sources an                                                                                                   | months to account for all sealed sources and<br>ed pursuant to 10 CFR 35.59, 35.400 and<br>nd devices.                                                                                    |
| 16. | Α.                 | Seal<br>conta<br>certi        | ed sources and detector cells containing licensed<br>amination at intervals not to exceed six months or<br>ficate of registration referred to in 10 CFR 32/210,                                                                                                   | material shall be tested for leakage and/or<br>at such other intervals as are specified by the<br>not to exceed three years.                                                              |
|     | В.                 | Notw<br>be te                 | vithstanding Paragraph A of this Condition, sealed<br>ested for leakage and/or contamination at intervals                                                                                                                                                         | sources designed to emit alpha particles shall not to exceed three months.                                                                                                                |
|     | C.                 | In the<br>mon<br>be p         | e absence of a certificate from a transferor indicati<br>ths prior to the transfer, a sealed source or detecto<br>ut into use until tested.                                                                                                                       | ng that a leak test has been made within six<br>or cell received from another person shall not                                                                                            |
|     | D.                 | Each<br>leak                  | n sealed source fabricated by the licensee shall be age, and contamination prior to any use or transfer                                                                                                                                                           | inspected and tested for construction defects,<br>as a sealed source.                                                                                                                     |
|     | E.                 | Seal                          | ed sources and detector cells need not be leak tes                                                                                                                                                                                                                | sted if:                                                                                                                                                                                  |
|     |                    | (i)                           | they contain only hydrogen-3; or                                                                                                                                                                                                                                  |                                                                                                                                                                                           |
|     |                    | (ii)                          | they contain only a radioactive gas; or                                                                                                                                                                                                                           |                                                                                                                                                                                           |
|     |                    | (iii)                         | the half-life of the isotope is 30 days or less; or                                                                                                                                                                                                               |                                                                                                                                                                                           |
|     |                    | (iv)                          | they contain not more than 100 microcuries of be than 10 microcuries of alpha emitting material; or                                                                                                                                                               | ta and/or gamma emitting material or not more                                                                                                                                             |
|     |                    | (v)                           | they are not designed to emit alpha particles, are<br>when they are removed from storage for use or tr<br>tested within the required leak test interval, they s<br>sealed source or detector cell shall be stored for<br>tested for leakage and/or contamination. | in storage, and are not being used. However,<br>ansfer to another person, and have not been<br>shall be tested before use or transfer. No<br>a period of more than 10 years without being |

| NRC | FORM 3                                                | 74A U.S. NUCLEAR REGULATORY COMMISSION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | PAGE 5 of 6 PAGES                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-----|-------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     |                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | License Number<br>08-01738-02                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|     |                                                       | MATERIALS LICENSE<br>SUPPLEMENTARY SHEET                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Docket or Reference Number<br>030-01317                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|     |                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Amendment No. 70                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|     | F. T<br>te<br>a<br>s<br>le<br>N<br>c<br>G. T          | he test shall be capable of detecting the presence of<br>st sample. If the test reveals the presence of 0.005 r<br>report shall be filed with the U.S. Nuclear Regulatory<br>hall be removed immediately from service and decon-<br>cordance with Commission regulations. The report<br>ak test result is known with the U.S. Nuclear Regulat<br>uclear Materials Safety Branch, 475 Allendale Road,<br>port shall specify the source or detector cell involved<br>he licensee is authorized to collect leak test samples<br>sts for leakage and/or contamination may be perform<br>ommission or an Agreement State to perform such se | 0.005 microcurie of radioactive material on the<br>nicrocurie or more of removable contamination,<br>Commission and the source or detector cell<br>taminated, repaired, or disposed of in<br>shall be filed within five days of the date the<br>ory Commission, Region I, ATTN: Chief,<br>King of Prussia, Pennsylvania 19406. The<br>the test results, and corrective action taken.<br>for analysis by the licensee. Alternatively,<br>ned by persons specifically licensed by the<br>ervices. |
| 17. | Seale<br>from s                                       | I sources or detector cells containing licensed materi                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | al shall not be opened or sources removed                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 18. | The lid<br>Sulfur<br>provid<br>A. V<br>B. E<br>a<br>d | ensee is authorized to hold radioactive material with<br>35, Cobalt 58, Iridium 192, Scandium 46, for decay-in<br>ed:<br>/aste to be disposed of in this manner shall be held for<br>efore disposal as ordinary trash, the waste shall be so<br>opropriate survey instrument set on its most sensitive<br>etermine that its radioactivity cannot be distinguished<br>emoved or obliterated.                                                                                                                                                                                                                                            | a physical half-life of less than 65 days and<br>n-storage before disposal in ordinary trash,<br>or decay a minimum of ten half-lives.<br>urveyed at the container surface with the<br>scale and with no interposed shielding to<br>from background. All radiation labels shall be                                                                                                                                                                                                              |
|     | C. A<br>y<br>p<br>ti<br>p                             | record of each such disposal permitted under this Lidears. The record must include the date of disposal, the aced in storage, the radionuclides disposed, the survive dose rate measured at the surface of each waste conformed the disposal.                                                                                                                                                                                                                                                                                                                                                                                          | cense Condition shall be retained for three<br>ne date on which the byproduct material was<br>yey instrument used, the background dose rate,<br>container, and the name of the individual who                                                                                                                                                                                                                                                                                                   |
| 19. | Exper<br>mater                                        | mental animals, or the products from experimental ar<br>als shall not be used for human consumption.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | nimals, that have been administered licensed                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 20. | The lic<br>presc<br>35.10                             | censee shall possess and use byproduct material for iptive and performance criteria in all sections of 10 C 0, 35.200, and 35.300.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | human research in accordance with the<br>FR Part 35 except sections 35.49(a) and (b),                                                                                                                                                                                                                                                                                                                                                                                                           |
| 21. | The li<br>71, "F                                      | censee is authorized to transport licensed material in ackaging and Transportation of Radioactive Material.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | accordance with the provisions of 10 CFR Part<br>"                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 22. | The li<br>has b                                       | censee shall not acquire licensed material in a sealed<br>een registered with the U.S. Nuclear Regulatory Com                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | source or device unless the source or device mission pursuant to 10 CFR 32.210 or                                                                                                                                                                                                                                                                                                                                                                                                               |

|                                                                                 |                                                                                                                                      |                                                                                                                      |                                                                                                                               |                                                          |                                           |                               | _                           |               |
|---------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|-------------------------------------------|-------------------------------|-----------------------------|---------------|
|                                                                                 | RM 374A U.S. NUCLEAR REGU                                                                                                            | LATORY COMMISSION                                                                                                    |                                                                                                                               | PAGE                                                     | 6                                         | of                            | 6                           | PAGES         |
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|                                                                                 | MATERIALS LICENSE<br>SUPPLEMENTARY SHEET                                                                                             |                                                                                                                      | Docket or Reference Numbe<br>030-01317                                                                                        | r                                                        | ·····                                     |                               |                             |               |
|                                                                                 |                                                                                                                                      |                                                                                                                      | Amendment No. 70                                                                                                              |                                                          | <u> </u>                                  |                               |                             |               |
|                                                                                 |                                                                                                                                      |                                                                                                                      | ,<br>                                                                                                                         | ·                                                        |                                           |                               |                             | <del>~~</del> |
|                                                                                 |                                                                                                                                      |                                                                                                                      |                                                                                                                               |                                                          |                                           |                               |                             |               |
| eq                                                                              | uivalent regulations of an Agreement S                                                                                               | State.                                                                                                               |                                                                                                                               |                                                          |                                           |                               |                             |               |
| 23. Ra<br>pro<br>Se                                                             | idioactive waste generated shall be sto<br>ocedures included with the waste stora<br>optember 9, 1993 and October 29, 1993           | red in accordance<br>ge plan described<br>3.                                                                         | with the statements, r<br>in the licensee's letter                                                                            | epreser<br>/applica                                      | ntatio<br>tion c                          | ns, a<br>lated                | nd                          | ~             |
| 24. No<br>roc<br>pro                                                            | otwithstanding the requirements of 10 C<br>oms used to house radiopharmaceutica<br>ocedures contained in the letters dated           | CFR 35,315(a)(7), t<br>al therapy patients<br>April 8, 1992 and I                                                    | he licensee may cont<br>in accordance with the<br>November 24, 1992.                                                          | rol conta<br>e comm                                      | amina<br>itmer                            | ation<br>hts ar               | in<br>nd                    |               |
| 25. Ex<br>ac<br>an<br>pro<br>the<br>M<br>A.<br>B.<br>C.<br>D.<br>E.<br>F.<br>G. | Application dated January 21, 1993<br>Letter dated October 29, 1993<br>Letter dated February 15, 1994<br>Letter dated Januer 2, 1993 | in this license, the<br>intations, and proce-<br>ninor changes in the<br>lear Regulatory Co-<br>cedures in the licer | licensee shall conduct<br>edures contained in the<br>medical use radiation<br>mmission's regulation<br>asee's application and | ct its pro<br>e docun<br>on safet<br>os shall<br>corresp | ogram<br>nents<br>/ pro-<br>gove<br>bonde | n in<br>cedu<br>rn un<br>ance | udir<br>res<br>iless<br>are | ng<br>as<br>s |
|                                                                                 |                                                                                                                                      |                                                                                                                      |                                                                                                                               |                                                          |                                           |                               |                             | ÷.            |
|                                                                                 |                                                                                                                                      | •                                                                                                                    |                                                                                                                               |                                                          |                                           |                               |                             |               |
|                                                                                 |                                                                                                                                      | For the U.S                                                                                                          | 6. Nuclear Regulatory                                                                                                         | Commis                                                   | sion                                      |                               |                             |               |
| Date                                                                            | April 24, 1998                                                                                                                       | <b>Ori</b> g<br>Bv                                                                                                   | ginal signed by Mich                                                                                                          | elle Be                                                  | ardsi                                     | ley                           |                             |               |
|                                                                                 |                                                                                                                                      | Mic                                                                                                                  | helle Beardslev                                                                                                               |                                                          |                                           |                               |                             |               |
|                                                                                 |                                                                                                                                      | Nuc                                                                                                                  | clear Materials Safety                                                                                                        | Branch                                                   | 1                                         |                               |                             |               |
|                                                                                 |                                                                                                                                      | Divi                                                                                                                 | ision of Nuclear Mater                                                                                                        | ials Saf                                                 | ety                                       |                               |                             |               |
|                                                                                 |                                                                                                                                      | Reg                                                                                                                  | jion l                                                                                                                        | <b>.</b> .                                               |                                           |                               |                             |               |
|                                                                                 |                                                                                                                                      | Kin                                                                                                                  | g of Prussia, Pennsylv                                                                                                        | ania 19                                                  | 406                                       |                               |                             | ,<br>,        |

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<del>i n</del>

#### April 24, 1998

Docket No. 030-01317 Control No. 125557 License No. 08-01738-02

William B. Johnson Colonel, U.S. Army Radiation Protection Officer Department of the Army Walter Reed Army Medical Center (WRAMC) MCHL-HP/Health Physics Office Building 41, Room 38 Washington, DC 20307-5001

Dear Colonel Johnson:

This refers to your license amendment request. Enclosed with this letter is the amended license. The facilities at The Walter Reed Army Institute of Research Animal Holding Facility and the U.S. Army Institute of Dental Research Facility, Fort Meade, MD may be released for unrestricted use.

Please review the enclosed document carefully and be sure that you understand and fully implement all the conditions incorporated into the amended license. If there are any errors or questions, please notify the U.S. Nuclear Regulatory Commission, Region I Office, Licensing Assistance Team, (610) 337-5093 or 5239, so that we can provide appropriate corrections and answers.

Thank you for your cooperation.

Sincerely,

**ML10** 

Original signed by Michelle Beardsley

Michelle Beardsley Health Physicist Nuclear Materials Safety Branch 1 Division of Nuclear Materials Safety

Enclosure: Amendment No. 70

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| DATE   | 04/24/98   |     | 04/ /98 | 0 | )4/ /98 | 04/ /98 |

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2

W. Johnson

Radiation Protection Officer



#### DEPARTMENT OF THE ARMY NORTH ATLANTIC REGIONAL MEDICAL COMMAND WASHINGTON, DC 20307-5001

March 17, 1998

030-01317

REPLY TO ATTENTION OF Preventive Medicine Services

SUBJECT: Amendment Request to Remove the U.S. Army Institute of Dental Research Facility, and the Walter Reed Army Institute of Research Animal Holding Facility, Fort Meade, MD from NRC Byproduct Materials License 08-01738-02

Nuclear Regulatory Commission, Region I Division of Nuclear Material Safety 475 Alendale Road King of Prussia, Pennsylvania 19406-1415

Medical Licensing Division :

The Center for Health Promotion and Preventive Medicine has completed the decommissioning for the U.S. Army Institute of Dental Research Facility, Fort Meade, MD. The decommissioning of the buildings included a historical records investigation, meter surveys, and swipe surveys as recommended in NUREG/CR-5849, Manual for Conducting Radiological Surveys in Support of License Termination.

The Walter Reed Army Institute of Research Animal Holding Facility, Fort Meade, MD burned down in 1987 before a final decommissioning survey was performed. The only isotopes used at this location were a couple hundred microcuries of I-125 and I-131 used in a research protocol in the late 1970's. The buildings were all bulldozed into a mound and covered with earth after the fire. The Health Physics Office visited the site, and used a meter to survey the trash area, the location of the barn, and the animal holding area for any signs of radioactive materials and no meter readings above background were found. Since the half-lives of the radionuclides was so short, any radioactive iodine would have decayed away years ago.

Permanent records of all of the decommissioning surveys are maintained in the Health Physics Office files (enclosures 1 and 2).

Amend Paragraph 10, Location of Use, of NRC Byproduct Materials License 08-01738-02, to specifically remove the U.S. Army Institute of Dental Research Facility, Fort Meade, MD, and the Walter Reed Army Institute of Research Animal Holding Facility, Fort Meade, MD from the license.

For additional information regarding this amendment, please contact Colonel William B. Johnson, Chief, Health Physics Office, Preventive Medicine Services, at (202) 356-0058.

Sincerely,

William B. Johnson Colonel, U.S. Army Radiation Protection Officer

CF: CDR, MEDCOM, ATTN: MCHO-CL-W

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MAR 20 1998



#### DEPARTMENT OF THE ARMY U.S. ARMY CENTER FOR HEALTH PROMOTION AND PREVENTIVE MEDICINE 5158 BLACKHAWK ROAD ABERDEEN PROVING GROUND, MARYLAND 21010-5422

MCHB-TS-OIP (40)

# 04 FEB 1998

MEMORANDUM FOR Commander, U.S. Army Medical Command, ATTN: MCHO-CL-W, 2050 Worth Road, Suite 10, Fort Sam Houston, TX 78234-6010

SUBJECT: Industrial Radiation Survey No. 27-MH-7237-R-98, Facility Close-Out and Termination Survey, Fort Meade, MD, 11 August 1997-23 January 1998

1. Copies of subject report with Executive Summary are enclosed. Findings, recommendations, all specific requests by Department of the Army Licensees, Walter Reed Army Institute of Research, Base Realignment and Closure Office, U.S. Army Medical Command, the State of Maryland Bureau of Environmental Radiation, Maryland Department of the Environment, and the U.S. Environmental Protection Agency Region III representatives were addressed and staffed with the appropriate personnel assigned to support this project.

2. The final laboratory analyses of wipe test samples were completed on 8 October 1997 for the Fort Meade buildings.

FOR THE COMMANDER:

Encl

Program Manager Industrial Health Physics

CF (w/encl): HODA (DASA-ESOH/MR. FATZ) HQDA (DAIM-ED-R/MR. SCHROEDER) CDR, AMC, ATTN: AMCSF-P (2 CY) CDR, ACALA, ATTN: AMSTA-AC-SF (2 CY) CDR, IOC, ATTN: AMSIO-DMS CDR, ATCOM, ATTN: AMSAV-X/RPO (2 CY) CDR, CECOM, ATTN: AMSEL-SF (2 CY) CDR, TACOM, ATTN: AMSTA-CZ (2 CY) CDR, WRAMC, ATTN: COL JOHNSON

**Readiness thru Health** 

# U.S. Army Center for Health Promotion and Preventive Medicine







INDUSTRIAL RADIATION SURVEY NO. 27-MH-7237-R-98 FACILITY CLOSE-OUT AND TERMINATION SURVEY FORT MEADE, MARYLAND 11 AUGUST 1997 - 23 JANUARY 1998





Distribution limited to U.S. Government agencies only; protection of privileged information evaluating another command; Feb 98. Requests for this document must be referred to Commander, U.S. Army Medical Command, ATTN: MCHO-CL-W, 2050 Worth Road, Suite 10, Fort Sam Houston, Texas 78234-6010.

# Readiness Thru Health

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#### DEPARTMENT OF THE ARMY U.S. ARMY CENTER FOR HEALTH PROMOTION AND PREVENTIVE MEDICINE 5158 BLACKHAWK ROAD ABERDEEN PROVING GROUND, MARYLAND 21010-5422

EXECUTIVE SUMMARY INDUSTRIAL RADIATION SURVEY NO. 27-MH-7237-R-98 FACILITY CLOSE-OUT AND TERMINATION SURVEY FORT MEADE, MARYLAND 11 AUGUST 1997 - 23 JANUARY 1998

1. PURPOSE. This survey was conducted to determine the presence and extent of radiological health hazards in select buildings at Fort Meade. These buildings are associated with the ongoing Base Realignment and Closure actions at Walter Reed Army Institute of Research which includes Buildings 2802, 2805, and 2813 at Fort Meade. This survey also verified that any residual radioactivity in the buildings surveyed is in compliance with the Nuclear Regulatory Commission and the State of Maryland guidelines for decontamination of facilities prior to release for unrestricted use.

2. CONCLUSION. A review of the survey results indicates that there were no radiological health hazards identified as a result of the use and storage of radioactive commodities in Buildings 2802, 2805, and 2813.

3. RECOMMENDATION. Recommend the above mentioned buildings be released for unrestricted use.

**Readiness thru Health** 

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#### DEPARTMENT OF THE ARMY U.S. ARMY CENTER FOR HEALTH PROMOTION AND PREVENTIVE MEDICINE 5158 BLACKHAWK ROAD ABERDEEN PROVING GROUND, MARYLAND 21010-5422

REPLY TO ATTENTION OF

#### MCHB-TS-OIP

# INDUSTRIAL RADIATION SURVEY NO. 27-MH-7237-R-97 FACILITY CLOSE-OUT AND TERMINATION SURVEY FORT MEADE, MARYLAND 11 AUGUST 1997 - 23 JANUARY 1998

1. REFERENCES. See Appendix A for a list of references.

2. AUTHORITY. Telephone conversation between 1LT Luke Shattuck, RPO, Fort Meade, and Mr. Scott Kaeppel, Health Physicist, Henry M. Jackson Foundation Participant, USACHPPM, subject: Radiation Survey at Fort Meade for the Army Institute of Dental Research, 28 July 1997.

3. PURPOSE.

a. This survey was conducted to determine the presence and extent of radiological health hazards in Buildings 2802, 2805, and 2813. These buildings fall under the Nuclear Regulatory Commission (NRC) licenses for the Walter Reed Army Institute of Research, and are being turned over for unrestricted use.

b. This survey also verified that any remaining residual radioactivity in the buildings surveyed is in compliance with the NRC and the State of Maryland guidelines for decontamination of facilities prior to release for unrestricted use.

4. GENERAL.

a. Meetings and briefings were conducted by Mr. Scott Kaeppel with 1LT Luke Shattuck to discuss the findings and recommendations.

b. Project management for the close-out and termination survey was conducted by the U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM).

c. The survey was managed by Mr. Mark S. Ditmore, Research Health Physics Consultant, Henry M. Jackson Foundation Participant, USACHPPM, CPT Joseph Beckman, Nuclear Medical Science Officer (Alternate Project Manager), USACHPPM, and Mr. Andrew Perry Brown,

**Readiness thru Health** 

(3) No buildings were identified as having radiological contamination levels above the limits specified by the NRC and State of Maryland guidelines.

c. <u>Potential Contaminants and Release Guidelines</u>. See Industrial Radiation Survey Protocol No. 27-MH-7237-P-98 for a detailed listing of potential radioactive materials at Fort Meade. The release guidelines for these potential contaminants are listed in Appendix D.

6. RADIATION SURVEYS AND RESULTS.

#### a. <u>Instrumentation/Equipment</u>.

(1) A list of instruments is provided in Appendix E. The Minimum Detectable Activity (MDA) of each instrument is supplied with the instrument survey data in Appendix C. Efficiencies were determined with a radioisotope traceable to the National Institute of Standards and Technology (NIST) which had energies similar to the energies of the isotopes used and stored at Fort Meade.

(2) After calibration, an efficiency factor was calculated for each alpha and beta instrument to correlate the meter reading to the actual radioactivity present.

(3) The alpha and beta probes used for the survey were 100 square centimeter  $(cm^2)$  gas flow proportional probes. The gamma probe used was a 1 inch x 1 inch sodium iodide crystal. The equation to convert counts per minute (cpm) to disintegrations per minute (dpm) per 100 cm<sup>2</sup> can be found in the NUREG/CR-5849, page 8.2, Section 8.1.1.

(4) The efficiency value for each instrument was used to record the final reading into standardized regulatory criteria expressed in dpm/100 cm<sup>2</sup>. The monitoring values for gross alpha and gross beta in the tables of Appendix C are presented in the converted values of dpm/100 cm<sup>2</sup>.

(5) The sensitivity of the gamma survey meter correlates with NUREG/CR-5849, page 5-14, Table 5-6.

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(5) The sensitivity of the gamma survey meter correlates with NUREG/CR-5849, page 5-14, Table 5-6.

greater than three times above background, it would have been marked and a fixed reading taken at that point.

(4) If a building or room was classified as an "unaffected" area, a biased scan was performed over a minimum of 10% of the surface area IAW the protocol. Typically, greater than 50% of the surface area of "unaffected" surfaces was scanned at Fort Meade. During scanning, if a measured reading was found to be greater than three times above background, it would be marked and fixed meter readings (alpha, beta-gamma, and gamma) taken at that point. If no measurements were found three times above background, the surveyor took a minimum of 30 random fixed readings in the subject area.

(5) Each room was subdivided into ceilings, walls, and floors, which were further divided into grid squares. Unusual building features were surveyed in random locations and the highest values observed were recorded.

(6) All north walls were identified as Wall A (WA) and the other walls were assigned consecutive letters in a clockwise manner around the room (i.e., WB, WC, and WD). The grid squares always started in the lower left corner of the wall. The first lower 1m x 1m (affected area) meter grid square was identified as "WA1A" and the grid square directly above was designated "WA1B", with "B" representing the next horizontal row on the wall.

(7) Floors were gridded using a different system. The grid squares always started in the northwest corner of the floor. The northwest grid square was identified as FA1. The grid squares to the east would be FA2, FA3, etc. The grid squares to the south would be FB1, FC1, etc.

(8) Flag values, or action levels, for alpha and betagamma monitoring measurements were established for each type of survey instrument used. Flag values were established by taking 75% of the release criteria found in Appendix D. If any instrument reading exceeded the flag values, a more thorough investigation was conducted to determine if the detected radiation was above the established criteria.

monitored. The average background values were established at a 95% confidence level. Background survey results are presented with the site survey results in Appendix C.

(2) Instrumentation Survey Results.

(a) Alpha Instrumentation Results. The gross alpha activity ranged from a low of  $-9.1 \text{ dpm}/100 \text{ cm}^2$  to a high of 40.3 dpm/100 cm<sup>2</sup>, which was taken on a porcelain sink. A fixed meter reading was taken in each grid square at less than 0.5 cm from the surface. All alpha activity results and location of survey results are presented in Appendix C. Gross alpha analysis shows no sample data that exceeds release criteria.

(b) Beta-Gamma Instrumentation Results. A fixed meter reading was taken in each grid square at less than 0.5 cm from the surface. Instrument field data indicates high beta-gamma readings in restrooms in Buildings 2802 and 2805. The restrooms in these buildings have ceramic tiles on the floors and part of the walls, and porcelain sinks. Ceramics normally contain a high amount of naturally occurring radioisotopes of potassium. The gross betagamma activity ranged from a low of  $-307.2 \text{ dpm}/100 \text{ cm}^2$  to a high of 2878 dpm/100 cm<sup>2</sup>, which was taken on a porcelain sink. None of the field instrument readings exceed the release criteria. All betagamma survey results and locations are presented in Appendix C.

(c) Gamma Instrumentation Results. The gross gamma activity ranged from a low of -3.5 microroentgen per hour ( $\mu$ R/hr) to a high of 6.6  $\mu$ R/hr. The average gamma rate for each survey unit does not exceed the 5  $\mu$ R/hr limit. Each grid square was surveyed at approximately 1 m from the surface and the location with the highest exposure reading was recorded. All gamma survey results and locations are presented in Appendix C.

(d) Scanning Instrumentation Results. One hundred percent of the surface area of "affected areas" was scanned. The protocol states that a minimum of 10% of the surface area of "unaffected" areas will be scanned. However, the "unaffected" area scans were typically performed over greater than 50% of the surface area.

(3) Laboratory Analysis. Wipe test samples were collected and analyzed for gross alpha, gross beta-gamma, and tritium

8. RECOMMENDATION. Recommend that the surveyed buildings listed above be released for unrestricted use.

MARK S. DITMORE Research Health Physics Consultant Henry M. Jackson Foundation Participant Industrial Health Physics Program

CPT JOSEPH M. BECKMAN Nuclear Medical Science Officer Industrial Health Physics Program

**APPROVED:** 

Program Manager Industrial Health Physics
#### APPENDIX A

### REFERENCES

1. NUREG/CR-5849, Manual for Conducting Radiological Surveys in Support of License Termination, Draft Report for Comment, June 1992.

2. AR 385-11, Ionizing Radiation Protection (Licensing, Control, Transportation, Disposal, and Radiation Safety), 1 May 1980.

3. Title 10, Code of Federal Regulations (CFR), Part 20, Standards for Protection Against Radiation, 1993 Rev.

4. Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct, Source, or Special Nuclear Material, August 1987.

5. NUREG-1500, Working Draft Regulatory Guide on Release Criteria for Decommissioning: NRC Staff's Draft for Comment, August 1994.

6. Industrial Radiation Survey Protocol No. 27-MH-7237-P-98, U.S. Army Institute of Dental Research, Fort Meade, MD, January 1998.

7. Industrial Radiation Survey No. 27-MH-7237-H-98, Historical Data Review, Walter Reed Army Institute of Dental Research, Fort Meade, MD, September - November 1997.

# APPENDIX B

## ABBREVIATIONS

| · ·             |                                                |
|-----------------|------------------------------------------------|
| AR              | Army Regulation                                |
| bkg             | background                                     |
| cal             | calibration                                    |
| CFR             | Code of Federal Regulations                    |
| Cm              | centimeter                                     |
| cm <sup>2</sup> | centimeter square                              |
| CDM             | counts per minute                              |
| $C_{2}=137$     | cosium-137                                     |
| dom             | disintegrations per minute                     |
| apm<br>- 55     |                                                |
| ell             | efficiency                                     |
| IAW             | in accordance with                             |
| inst            | instrument                                     |
| m               | meter                                          |
| MDA             | Minimum Detectable Activity                    |
| NIST            | National Institute of Standards and Technology |
| NRC             | Nuclear Regulatory Commission                  |
| NUREG           | Nuclear Regulatory Guide                       |
| QA              | Quality Assurance                              |
| SN              | serial number                                  |
| USACHPPM        | U.S. Army Center for Health Promotion and      |
|                 | Preventive Medicine                            |
| µR/hr           | microroentgen per hour                         |
| μCi             | microcurie                                     |
| •               |                                                |

## APPENDIX C

LIST OF BUILDINGS SURVEYED BUILDING DIAGRAMS RADIOLOGICAL SURVEY RESULTS Grids at "1m x 1m" unless otherwise annotated

# BUILDINGS SURVEYED

2802 2805 2813





| Fort Meade, Building 2802 (Room 1) |             |             |       |            |                     |                                          |         |  |
|------------------------------------|-------------|-------------|-------|------------|---------------------|------------------------------------------|---------|--|
| Location                           |             | Monitoring  |       |            | Wipe Test           | an a |         |  |
| Code                               | Alpha       | Beta        | Gamma | Alpha      | Beta                | LS                                       | Wipe    |  |
| (Units =>)                         | dpm/100cm^2 | dpm/100cm^2 | uR/hr | dpr        | m/100cm^2 +/- 2 sig | ma                                       | Number  |  |
| (Bkgd =>)                          | 1.7         | 149.47      | 5.00  | 0.0        | 2.0                 | 28.9                                     |         |  |
| (MDA =>)                           | 54          | 401         | -     | 2.3        | 2.4                 | 29.1                                     |         |  |
| FA1                                | 1.6         | 91.6        | -0.8  | -0.1 ± 0.1 | 0.0 ± 2.5           | -19.0 ± 9.4                              | GA00509 |  |
| FA2                                | -9.1        | 135.9       | -0.8  | -0.1 ± 0.1 | -0.5 ± 2.2          | -15.9 ± 8.9                              | GA00510 |  |
| FA3                                | -9.1        | 146.9       | -0.6  | -0.1 ± 0.1 | 0.0 ± 2.5           | -16.4 ± 8.7                              | GA00511 |  |
| FA4                                | -9.1        | 279.9       | -0.7  | -0.1 ± 0.1 | 1.6 ± 3.1           | -15.1 ± 8.8                              | GA00512 |  |
| FA5                                | -9.1        | 335.3       | -0.9  | -0.1 ± 0.1 | 1.6 ± 3.1           | -20.4 ± 8.0                              | GA00513 |  |
| FA6                                | -9.1        | 146.9       | -0.9  | -0.1 ± 0.1 | -1.1 ± 1.9          | -14.2 ± 8.9                              | GA00514 |  |
| FA7                                | -9.1        | 135.9       | -1.0  | -0.1 ± 0.1 | 1.1 ± 2.9           | -18.2 ± 8.5                              | GA00515 |  |
| FB1                                | -9.1        | 346.3       | -0.9  | -0.1 ± 0.1 | -0.5 ± 2.2          | -17.1 ± 9.3                              | GA00516 |  |
| FB2                                | -9.1        | 213.4       | -0.9  | 0.7 ± 1.5  | 1.1 ± 2.9           | -17.7 ± 9.0                              | GA00517 |  |
| FB3                                | -9.1        | 268.8       | -0.9  | -0.1 ± 0.1 | 2.2 ± 3.3           | -15.9 ± 8.9                              | GA00518 |  |
| FB4                                | -9.1        | 279.9       | -0.8  | -0.1 ± 0.1 | -0.5 ± 2.2          | -15.6 ± 8.8                              | GA00519 |  |
| FB5                                | -9.1        | 291.0       | -0.9  | 0.7 ± 1.5  | 2.2 ± 3.3           | -19.1 ± 8.6                              | GA00520 |  |
| FB6                                | -9.1        | 169.1       | -0.9  | -0.1 ± 0.1 | 2.7 ± 3.4           | -13.8 ± 8.9                              | GA00521 |  |
| FB7                                | -9.1        | 257.7       | -0.7  | -0.1 ± 0.1 | -0.5 ± 2.2          | -16.0 ± 8.7                              | GA00522 |  |
| FC1                                | 1.6         | 368.5       | -0.6  | -0.1 ± 0.1 | -1.1 ± 1.9          | -11.8 ± 9.3                              | GA00523 |  |
| FC2                                | -9.1        | 434.9       | -0.7  | -0.1 ± 0.1 | -1.6 ± 1.6          | -14.5 ± 9.1                              | GA00524 |  |
| FC3                                | 12.3        | 169.1       | -0.9  | -0.1 ± 0.1 | 0.0 ± 2.5           | -17.8 ± 8.5                              | GA00525 |  |
| FC4                                | -9.1        | 124.8       | -1.1  | -0.1 ± 0.1 | -2.2 ± 1.2          | -17.7 ± 8.8                              | GA00526 |  |
| FC5                                | -9.1        | 180.2       | -1.1  | 0.7 ± 1.5  | -2.2 ± 1.2          | -12.3 ± 8.6                              | GA00527 |  |
| FC6                                | 1.6         | 224.5       | -0.9  | -0.1 ± 0.1 | 0.0 ± 2.5           | -14.3 ± 8.6                              | GA00528 |  |
| FC7                                | 1.6         | 235.6       | -0.8  | -0.1 ± 0.1 | 0.0 ± 2.5           | -20.4 ± 8.3                              | GA00529 |  |
| FD1                                | -9.1        | -107.8      | -0.7  | -0.1 ± 0.1 | -0.5 ± 2.2          | -8.4 ± 9.4                               | GA00530 |  |
| FD2                                | -9.1        | 279.9       | -0.8  | -0.1 ± 0.1 | 1.6 ± 3.1           | -15.9 ± 8.9                              | GA00531 |  |
| FD3                                | 22.9        | 158.0       | -0.8  | -0.1 ± 0.1 | 1.1 ± 2.9           | -12.3 ± 9.3                              | GA00532 |  |
| FD4                                | -9.1        | 135.9       | -1.0  | 0.7 ± 1.5  | 2.7 ± 3.4           | -15.6 ± 8.8                              | GA00533 |  |
| FD6                                | -9.1        | 69.4        | -1.1  | -0.1 ± 0.1 | 1.6 ± 3.1           | -12.0 ± 9.1                              | GA00534 |  |
| FD7                                | -9.1        | 3.0         | -1.1  | -0.1 ± 0.1 | -0.5 ± 2.2          | -17.8 ± 8.5                              | GA00535 |  |
| FE1                                | -9.1        | 379.6       | -1.1  | -0.1 ± 0.1 | -1.6 ± 1.6          | -20.0 ± 8.3                              | GA00536 |  |
| FE2                                | -9.1        | 47.3        | -1.1  | -0.1 ± 0.1 | 0.5 ± 2.7           | -20.9 ± 8.2                              | GA00537 |  |
| FE3                                | 1.6         | 69.4        | -1.2  | -0.1 ± 0.1 | -0.5 ± 2.2          | -14.3 ± 9.6                              | GA00538 |  |
| FE4                                | -9.1        | 80.5        | -1.5  | -0.1 ± 0.1 | 0.0 ± 2.5           | -17.3 ± 8.8                              | GA00539 |  |
| FE5                                | 1.6         | 91.6        | -1.4  | -0.1 ± 0.1 | 11± 2.9             | -16.0 ± 8.7                              | GA00540 |  |
| FE6                                | -9.1        | 135.9       | -1.2  | -0.1 ± 0.1 | 1.1 ± 2.9           | -13.8 ± 8.9                              | GA00541 |  |
| FE7                                | -9.1        | 279.9       | -1.0  | -0.1 ± 0.1 | 1.1 ± 2.9           | -19.0 ± 9.1                              | GA00542 |  |
| WA1A                               | -9.1        | 180.2       | -0.3  | -0.1 ± 0.1 | 0.5 ± 2.7           | -12.4 ± 9.1                              | GA00543 |  |
| WA2A                               | -9.1        | 69.4        | 0.0   | -0.1 ± 0.1 | 0.5 ± 2.7           | -14.5 ± 8.4                              | GA00544 |  |
| WA3A                               | -9.1        | 368.5       | -0.2  | -0.1 ± 0.1 | -0.5 ± 2.2          | -16.6 ± 8.2                              | GA00545 |  |
| WA4A                               | -9.1        | 135.9       | -0.6  | -0.1 ± 0.1 | 1.1 ± 2.9           | -18.3 ± 8.0                              | GA00546 |  |
| WA5A                               | -9.1        | 169.1       | -0.7  | 0.0 ± 0.0  | -1.0 ± 1.9          | -14.0 ± 8.5                              | GA00547 |  |
| WA6A                               | -9.1        | 69.4        | -0.7  | 0.9 ± 1.6  | 0.4 ± 2.2           | -13.8 ± 8.9                              | GA00548 |  |
| QA                                 | N/A         | N/A         | N/A   | 0.3 ± 1.1  | -1.3 ± 1.5          | -19.5 ± 9.7                              | GA00549 |  |
| WA7A                               | 1.6         | 135.9       | -0.6  | -0.3 ± 0.2 | -1.3 ± 1.5          | -17.4 ± 8.3                              | GA00550 |  |
| WA1B                               | -9.1        | 357.4       | -0.5  | 0.3 ± 1.1  | 0.8 ± 2.4           | -11.3 ± 8.9                              | GA00551 |  |
| WA2B                               | -9.1        | 346.3       | -0.6  | -0.3 ± 0.2 | -0.4 ± 1.9          | -15.7 ± 8.5                              | GA00552 |  |
| WA3B                               | -9.1        | 36.2        | -0.3  | -0.3 ± 0.2 | 0.8 ± 2.4           | -19.6 ± 7.9                              | GA00553 |  |
| WA4B                               | 1.6         | 324.2       | -0.6  | 0.3 ± 1.1  | 1.3 ± 2.5           | -10.9 ± 9.0                              | GA00554 |  |
| WA5B                               | -9.1        | 135.9       | -0.6  | 0.3 ± 1.1  | -0.8 ± 1.7          | -17.9 ± 8.1                              | GA00555 |  |
| WA6B                               | 1.6         | 313.1       | -0.6  | -0.3 ± 0.2 | -0.8 ± 1.7          | -17.8 ± 8.3                              | GA00556 |  |
| WA7B                               | -9.1        | 124.8       | -0.7  | 0.3 ± 1.1  | 0.4 ± 2.2           | -16.2 ± 8.3                              | GA00557 |  |
| WB1A                               | 1.6         | 58.3        | -0.8  | -0.3 ± 0.2 | -0.4 ± 1.9          | -20.0 ± 7.9                              | GA00558 |  |

C-4-1

|                |             | Fo          | rt Meade, | Building 2802  | (Room 1)            | · · · ·           |          |
|----------------|-------------|-------------|-----------|----------------|---------------------|-------------------|----------|
| Location       |             | Monitoring  |           |                | Wipe Test           | · · · · ·         |          |
| Code           | Alpha       | Beta        | Gamma     | Alpha          | Beta                | LS                | Wipe     |
| (Units =>)     | dpm/100cm^2 | dpm/100cm^2 | uR/hr     | dpi            | m/100cm^2 +/- 2 sig | ma                | Number   |
| (Bkgd =>)      | 1.7         | 149.47      | 5.00      | 0.0            | 2.0                 | 28.9              |          |
| (MDA =>)       | 54          | 401         | -         | 2.3            | 2.4                 | 29.1              |          |
| WB2A           | -9.1        | -107.8      | -0.8      | -0.3 ± 0.2     | -0.8 ± 1.7          | -13.2 ± 8.5       | GA00559  |
| WB3A           | -9.1        | -130.0      | -0.7      | 0.3 ± 1.1      | 1.3 ± 2.5           | -9.6 ± 9.1        | GA00560  |
| WB4A           | 12.3        | 357.4       | -0.5      | -0.3 ± 0.2     | -0.4 ± 1.9          | -14.9 ± 8.4       | GA00561  |
| WB5A           | 1.6         | -74.6       | -0.4      | -0.3 ± 0.2     | 0.0 ± 2.1           | -12.2 ± 8.9       | GA00562  |
| WB1B           | -9.1        | -41.3       | -0.4      | 0.3 ± 1.1      | 3.8 ± 3.2           | -12.2 ± 8.9       | GA00563  |
| WB2B           | 1.6         | 91.6        | -0.3      | -0.3 ± 0.2     | 0.0 ± 2.1           | -16.6 ± 8.2       | GA00564  |
| WB3B           | -9.1        | -96.7       | -0.2      | 1.4 ± 2.0      | 0.0 ± 2.1           | $-20.5 \pm 9.6$   | GA00565  |
| WB4B           | -9.1        | -96.7       | -0.3      | 0.3 ± 1.1      | 0.0 ± 2.1           | $-16.5 \pm 8.4$   | GA00566  |
| WB5B           | 12.3        | 302.0       | -0.3      | 0.3 ± 1.1      | 0.8 ± 2.4           | $-16.5 \pm 8.4$   | GA00567  |
| WC1A           | 1.6         | -19.2       | -0.5      | 1.4 ± 2.0      | 0.0 ± 2.1           | -18.7 ± 8.4       | GA00568  |
| WC2A           | -9.1        | 91.6        | -0.3      | $0.3 \pm 1.1$  | -0.4 ± 1.9          | $-140 \pm 85$     | GA00569  |
| WC3A           | -9.1        | 58.3        | -0.8      | $-0.3 \pm 0.2$ | 0.4 ± 2.2           | $-15.2 \pm 8.6$   | GA00570  |
| WC4A           | 1.6         | 135.9       | -1.0      | $-0.3 \pm 0.2$ | $-1.3 \pm 1.5$      | -11.9 ± 8.7       | GA00571  |
| WC5A           | 1.6         | -74.6       | -1.1      | 1.4 + 2.0      | 08+ 24              | -119+ 87          | GA00572  |
| WC6A           | 22.9        | 124.8       | -1.2      | 03+ 11         | -0.8 + 1.7          | -132+ 85          | GA00573  |
| WC7A           | 33.6        | 3.0         | -10       | -03+02         | 04+ 22              | -10.4 + 9.0       | GA00574  |
| WC1B           | -91         | 14.0        | -0.8      | 0.01 0.1       | 21+ 28              | -10.4 2 0.0       | GA00575  |
| WC2B           | 12.3        | 302.0       | -0.8      | -03+02         | -0.4 + 1.9          | -22.2 1 10.7      | GA00576  |
| WC3B           | 1.0         | -19.2       | -0.8      | $-0.0 \pm 0.2$ | -0.4 1 1.3          | -162+ 94          | GA00577  |
| WC3B           | -9.1        | -74.6       | -1.0      | -03+02         | 0.4 + 22            | -10.2 ± 5.4       | GA00578  |
| WC4B           | 22.9        | 313.1       | -12       | $0.0 \pm 0.2$  | 0.4 ± 2.2           | -20.31 3.0        | GA00579  |
| WC5B           | -91         | 3.0         | -13       | $-0.3 \pm 0.2$ | 17+ 26              | -254 + 100        | GA00580  |
| WC6B           | -91         | 25.1        | -1.5      | -0.3 + 0.2     | -0.4 + 1.9          | -149+ 93          | GA00581  |
| WC7B           | -91         | 36.2        | -16       | -0.3 + 0.2     | -0.4 ± 1.5          | -195+ 97          | GA00582  |
| WD1A           | -9.1        | 58.3        | -1.5      | -03+ 02        | -0.8 + 1.7          | -165+ 84          | GA00583  |
| WD2A           | 1.6         | -163.2      | -12       | $0.3 \pm 0.2$  | -13+ 15             | -10.4 + 9.0       | GA00584  |
| WD3A           | -9.1        | 169.1       | -12       | 0.0 ± 1.1      | $-1.0 \pm 1.0$      | -153+ 83          | GA00585  |
| WD4A           | 22.9        | 279.9       | -1.0      | -03+ 02        | -0.4 + 1.9          | -722+79           | GA00586  |
| WD5A           | 12.3        | 146.9       | -0.7      | $0.3 \pm 0.2$  | 17+ 26              | -166+ 82          | GA00587  |
| WD1B           |             | 58.3        | -0.7      | 0.3 ± 1.1      | 21+ 28              | -165+ 84          | GA00588  |
| WD2B           | -91         | 80.5        | -0.7      | -03+ 02        | 0.0 + 2.1           | -173+ 88          | GA00589  |
| WD3B           | 12.3        | 169 1       | _0.7      | -0.3 ± 0.2     | -0.8 + 1.7          | -10.0 + 0.1       | GA00590  |
| WD4B           | 1.5         | -96 7       | -0.7      | -0.51 0.2      | -0.0 ± 1.7          | -10.0 ± 9.1       | GA00590  |
| WD5B           | 1.0         | 91.6        | -0.5      | 0.01 0.3       | 4.01 3.4            | -23.0 ± 0.0       | GA00502  |
| PCNT1          | -0.1        | 313.0       | -0.5      | $-0.3 \pm 0.2$ | -12± 25             | $-13.3 \pm 9.7$   | GA00592  |
| PCNT2          | -9.1        | 300.6       | -0.5      | $0.3 \pm 1.1$  | 1.3 ± 2.5           | -19.1 ± 9.7       | GA00593  |
| PCNT3          | -9.1        | 158.0       | - 1.0     | -0.3± 0.2      | -0.8 ± 1.7          | -20.5 ± 10.9      | GA00594  |
| RCNT4          | -9.1        | 324.2       | -0.9      | -0.3± 0.2      | $0.0 \pm 2.1$       | -19.5 ± 9.0       | GA00595  |
| IDCNIT5        | -5.1        | 302.0       | -0.9      | -0.3 ± 0.2     | 2.91 3.0            | -22.0 ± 10.0      | GA00590  |
| RCNTS          | -9.1        | 302.0       | -0.0      | -0.3 ± 0.2     | 1.3 ± 2.5           | -21.4 ± 9.2       | GA00597  |
| RCNT0          | 12.3        | 224.5       | -1.2      | -0.3 ± 0.2     | $0.0 \pm 2.1$       | -23.3 ± 9.6       | GA00598  |
|                | 12.3        | 213.4       | -1.3      | -0.3 ± 0.2     | 1.3 ± 2.5           | -20.0 ± 9.6       | GAUU599  |
| DCNT0          | 0.1         | 1N/A        |           | -0.3 1 0.2     | 0.41 2.2            | -20.4 ± 8.6       | GA00000  |
| RUNIO<br>DEVED | -9.1        | 000.9       | -1.4      | -0.3 ± 0.2     | -0.8 ± 1.7          | -18.6 ± 9.5       | GAUUBUT  |
| INC I CO       | -9.1        | 224.5       | -1.2      | 0.91 1.0       | U.4 ± 2.2           | -26.8 ± 10.5      | GAUU6U2  |
| IDONITU        | 1.0         | 368.5       | -1.4      | -0.3 ± 0.2     | 1./± 2.6            | -17.0 ± 9.1       | GA00603  |
| RCN111         | 1.6         | 1066.3      | -1.2      | -0.3 ± 0.2     | 1.3 ± 2.5           | -16.0 ± 10.8      | GA00604  |
| RCN112         | -9.1        | 180.2       | -0.9      | 2.0 ± 2.3      | 0.4 ± 2.2           | -20.9 ± 9.5       | GA00605  |
|                | 1.6         | 146.9       | -1.1      | -0.3 ± 0.2     | 0.0 ± 2.1           | -27.7 ± 10,1      | GA00606  |
| RU2            | 1.6         | 4/.3        | -1.1      | 0.3 ± 1.1      | 0.4 ± 2.2           | -16.4 ± 9.7       | GA00607  |
| IRD3           | 12.3        | 25.1        | I -0.9    | I -0.3 ± 0.2   | 1 -0.4 ± 1.9        | $1 -21.3 \pm 9.0$ | IGA00608 |

C-4-2

|            | Fort Meade, Building 2802 (Room 1) |             |       |            |                      |              |         |  |  |  |  |
|------------|------------------------------------|-------------|-------|------------|----------------------|--------------|---------|--|--|--|--|
| Location   | · ·                                | Monitoring  |       |            | Wipe Test            |              |         |  |  |  |  |
| Code       | Alpha                              | Beta        | Gamma | Alpha      | Beta                 | LS           | Wipe    |  |  |  |  |
| (Units =>) | dpm/100cm^2                        | dpm/100cm^2 | uR/hr | dp         | om/100cm^2 +/- 2 sig | jma          | Number  |  |  |  |  |
| (Bkgd =>)  | 1.7                                | 149.47      | 5.00  | 0.0        | 2.0                  | 28.9         | 7       |  |  |  |  |
| (MDA =>)   | 54                                 | 401         | -     | 2.3        | 2.4                  | 29.1         |         |  |  |  |  |
| RD5        | -9.1                               | 224.5       | -0.8  | 0.9 ± 1.6  | -0.4 ± 1.9           | -18.0 ± 10.3 | GA00609 |  |  |  |  |
| RD5        | -9.1                               | 146.9       | -0.8  | -0.3 ± 0.2 | 0.0 ± 2.1            | -17.7 ± 9.8  | GA00610 |  |  |  |  |
| RD6        | -9.1                               | 191.3       | -0.5  | 0.3± 1.1   | 0.0 ± 2.1            | -35.3 ± 13.1 | GA00611 |  |  |  |  |
| RD7        | -9.1                               | 324.2       | -0.7  | -0.3 ± 0.2 | 0.0 ± 2.1            | -20.0 ± 9.9  | GA00612 |  |  |  |  |
| RD8        | 1.6                                | 91.6        | -0.8  | 0.3 ± 1.1  | -0.8 ± 1.7           | -19.5 ± 9.9  | GA00613 |  |  |  |  |
| RD9        | -9.1                               | 124.8       | -1.2  | -0.3 ± 0.2 | 2.1 ± 2.8            | -24.1 ± 10.4 | GA00614 |  |  |  |  |
| RD10       | 1.6                                | 102.6       | -0.9  | 1.4 ± 2.0  | 0.8 ± 2.4            | -16.9 ± 11.1 | GA00615 |  |  |  |  |
| RD11       | -9.1                               | 102.6       | -1.1  | 0.3 ± 1.1  | 2.1 ± 2.8            | -27.6 ± 9.1  | GA00616 |  |  |  |  |

|            |             | Foi         | rt Meade, | Building 2802 | Room 2)             |              |         |
|------------|-------------|-------------|-----------|---------------|---------------------|--------------|---------|
| Location   |             | Monitoring  |           |               | Wipe Test           |              |         |
| Code       | Alpha       | Beta        | Gamma     | Aipha         | Beta                | LS           | Wipe    |
| (Units =>) | dpm/100cm^2 | dpm/100cm^2 | uR/hr     | . dpr         | n/100cm^2 +/- 2 sig | ma           | Number  |
| (Bkgd =>)  | 1.7         | 149.47      | 5.00      | 0.0           | 1.0                 | 32.8         | •       |
| (MDA =>)   | 54          | 401         | -         | 1.9           | 1.9                 | 23.6         | 1       |
| FA1        | -9.1        | 346.3       | -2.1      | -0.3 ± 0.2    | -0.4 ± 1.9          | -17.7 ± 9.8  | GA00617 |
| FA2        | -9.1        | 124.8       | -1:8      | -0.3 ± 0.2    | -0.8 ± 1.7          | -22.4 ± 9.9  | GA00618 |
| FA3        | 12.3        | 224.5       | -0.8      | -0.3 ± 0.2    | 0.0 ± 2.1           | -29.2 ± 9.9  | GA00619 |
| FB1        | -9.1        | 590.0       | -1.2      | -0.3 ± 0.2    | -1.3 ± 1.5          | -20.0 ± 9.9  | GA00620 |
| FB2        | -9.1        | -19.2       | -1.0      | -0.3 ± 0.2    | -0.4 ± 1.9          | -21.4 ± 9.5  | GA00621 |
| FB3        | -9.1        | 257.7       | -0.9      | -0.3 ± 0.2    | -0.4 ± 1.9          | -29.2 ± 9.9  | GA00622 |
| FC1        | -9.1        | 235.6       | -0.8      | -0.3 ± 0.2    | -0.4 ± 1.9          | -24.1 ± 10.4 | GA00623 |
| FC2        | 12.3        | 291.0       | -0.7      | 0.3 ± 1.1     | 0.0 ± 2.1           | -24.9 ± 11.0 | GA00624 |
| FC3        | 12.3        | 346.3       | -0.7      | -0.3 ± 0.2    | 0.4 ± 2.2           | -22.8 ± 9.3  | GA00625 |
| WA1A       | 1.6         | 224.5       | -0.7      | 0.3 ± 1.1     | -0.8 ± 1.7          | -19.6 ± 8.7  | GA00626 |
| WA2A       | -9.1        | 324.2       | -0.5      | -0.3 ± 0.2    | 1.3 ± 2.5           | -20.9 ± 8.5  | GA00627 |
| WA3A       | -9.1        | 146.9       | -0.3      | -0.3 ± 0.2    | 0.4 ± 2.2           | -22.6 ± 8.4  | GA00628 |
| WA1B       | 12.3        | 124.8       | -0.3      | -0.3 ± 0.2    | 0.0 ± 2.1           | -17.0 ± 9.1  | GA00629 |
| WA2B       | 12.3        | 36.2        | -0.4      | -0.3 ± 0.2    | -1.3 ± 1.5          | -18.7 ± 9.0  | GA00630 |
| WA3B       | 1.6         | 135.9       | -0.4      | -0.3 ± 0.2    | 2.5 ± 2.9           | -20.9 ± 9.3  | GA00631 |
| WB1A       | 12.3        | 257.7       | -0.2      | -0.3 ± 0.2    | -1.7 ± 1.2          | -18.2 ± 9.3  | GA00632 |
| WB2A       | 1.6         | 213.4       | -0.2      | 0.3 ± 1.1     | 2.5 ± 2.9           | -14.0 ± 9.2  | GA00633 |
| WB3A       | -9.1        | 191.3       | -0.3      | -0.3 ± 0.2    | 0.0 ± 2.1           | -21.5 ± 10.6 | GA00634 |
| WB1B       | -9.1        | 14.0        | -0.5      | -0.3 ± 0.2    | 1.7 ± 2.6           | -17.0 ± 9.1  | GA00635 |
| WB2B       | -9.1        | 124.8       | -0.6      | -0.3 ± 0.2    | 0.8 ± 2.4           | -27.7 ± 8.6  | GA00636 |
| WB3B       | 12.3        | 135.9       | -0.6      | -0.3 ± 0.2    | 0.0 ± 2.1           | -17.3 ± 9.3  | GA00637 |
| WC1A       | -9.1        | 135.9       | -0.5      | -0.3 ± 0.2    | 0.4 ± 2.2           | -19.6 ± 8.7  | GA00638 |
| WC2A       | -9.1        | 3.0         | -0.6      | -0.3 ± 0.2    | -0.4 ± 1.9          | -11.5 ± 9.4  | GA00639 |
| WC3A       | 1.6         | 124.8       | -0.8      | -0.3 ± 0.2    | 0.4 ± 2.2           | -26.0 ± 8.0  | GA00640 |
| WC1B       | 12.3        | 202.3       | -0.9      | -0.3 ± 0.2    | -0.8 ± 1.7          | -25.6 ± 9.1  | GA00641 |
| WC2B       | -9.1        | 14.0        | -0.9      | -0.3 ± 0.2    | -0.8 ± 1.7          | -20.4 ± 8.6  | GA00642 |
| WC3B       | 12.3        | 180.2       | -1.0      | 0.0 ± 0.0     | 0.5 ± 1.2           | -15.9 ± 9.7  | GA00643 |
| WD1A       | 33.6        | 291.0       | -1.0      | 0.0 ± 0.0     | -0.7 ± 0.6          | -16.6 ± 8.9  | GA00644 |
| WD2A       | -9.1        | 3.0         | -1.0      | 0.2 ± 0.4     | -0.2 ± 1.1          | -11.5 ± 9.4  | GA00645 |
| WD3A       | -9.1        | -19.2       | -1.1      | 0.0 ± 0.0     | 0.5 ± 1.1           | -18.3 ± 9.0  | GA00646 |
| WD1B       | -9.1        | -118.9      | -1.0      | 0.0 ± 0.0     | 0.7 ± 1.3           | -22.3 ± 9.1  | GA00647 |
| WD2B       | -9.1        | 102.6       | -1.0      | 0.0 ± 0.0     | -0.9 ± 0.4          | -15.1 ± 9.5  | GA00648 |
| WD3B       | -9.1        | 25.1        | -0.9      | 0.4 ± 0.6     | -0.6 ± 0.9          | -22.8 ± 9.3  | GA00649 |

C-5-1





| Lossition<br>Code         Monitoring         Monitoring         When         Alpha         Beta         Convert         Monitoring                                                                                                                                                                                                                         |            |             | Fo          | rt Meade, | e, Building 2802 (Room 3) |                      |                  |         |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-------------|-------------|-----------|---------------------------|----------------------|------------------|---------|
| Code         Alpha         Beta         Lis         Wither           (Units =>)         dpm/100cm/2         UR/hr         dpm/100cm/2         Visite         Mumber           (Units =>)         54         401         -         0.6         1.0         30.6           (MDA =>)         54         401         -         0.6         0.0         0.62         28.8         6         Acoost           (MDA =>)         54         401         -         0.6         0.0         0.23         0.9         22.3         9.4         6Acoost           FA2         1.6         2023         -0.9         0.0 ±         0.0         -0.1 ±         9.4         27.8         8         6Acoost           FA4         22.9         313.1         -0.1         0.0 ±         0.0 ±         0.7         -17.7         8.6         GAcost           FB3         -9.1         69.4         -0.5         -0.1 ±         0.0 ±         0.1         23.2         8.3         GAcost           FC4         -9.1         28.8         -0.1         0.0 ±         0.0 ±         0.2 ±         0.2 ±         0.2 ±         0.2 ±         0.2 ±         0.2 ±         0.2 ±         0.2 ±                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Location   | }           | Monitoring  |           |                           | Wipe Test            |                  |         |
| Units         john/100cm/2         UNIT         john/100cm/2         Vertice         Number           (Bkgd =>)         1.7         149.47         5.00         0.0         1.0         28.5           GA         NVA         NVA         NVA         NVA         NVA         0.0         0.0         0.0         0.0         22.5         8.4         GA00651           FA1         -5.1         22.7         8.8         GA00653         0.9         -22.2 ± 8.4         GA00653           FA2         1.6         202.3         0.9         0.0 ± 0.0         -0.1 ± 0.9         -17.7 ± 8.8         GA00653           FA3         -9.1         69.4         -1.1         0.0 ± 0.4         0.1 ± 0.9         -17.7 ± 8.8         GA00655           FB2         -9.1         30.0         -0.6         0.0 ± 0.0         0.0 ± 1.1         -23.2 ± 9.2         GA00655           FB1         -9.1         28.8         -0.7         0.0 ± 0.0         0.0 ± 1.1         -23.2 ± 9.2         GA00656           FC2         -9.1         136.9         -1.1         0.0 ± 0.0         0.5 ± 1.1         -23.2 ± 9.2         GA00656           FC3         -9.1         28.8         -0.2         0.2 ± 0.4                                                                                                                                                                                                                                                                                                                                                                                                                                   | Code       | Alpha       | Beta        | Gamma     | Alpha                     | Beta                 | LS               | Wipe    |
| (Bkgd =>)         1.7         149.47         5.00         0.0         1.0         306           (MDA =>)         54         401         -         0.6         1.0         28.5           CA         N/A         N/A         N/A         0.0±         0.0         -0.6±         0.6±         0.6         22.3±         8.6         GA00650           FA1         1.6         220.2         0.0         0.0±         0.0±         0.0±         0.0±         0.0±         0.0±         0.0±         0.0±         0.0±         0.0±         0.0±         0.0±         0.0±         0.0±         0.0±         0.0±         0.0±         0.0±         0.0±         0.0±         0.0±         0.0±         0.0±         0.0±         0.0±         0.0±         0.0±         0.0±         0.0±         0.0±         0.0±         0.0±         0.0±         0.0±         0.0±         0.0±         0.0±         0.0±         0.0±         0.0±         0.0±         0.0±         0.0±         0.0±         0.0±         0.0±         0.0±         0.0±         0.0±         0.0±         0.0±         0.0±         0.0±         0.0±         0.0±         0.0±         0.0±         0.0±         0.0±         0.0±                                                                                                                                                                                                                                                                                                                                                                                                                                     | (Units =>) | dpm/100cm^2 | dpm/100cm^2 | uR/hr     | dp                        | m/100cm^2 +/- 2 sigi | ma               | Number  |
| MOA         S4         401         .         0.6         1.0         265           FA1         -9.1         257.7         -0.9         0.0 ±         0.0         -0.3 ±         0.9         -22.3 ±         9.4         GA00851           FA2         1.6         202.3         -0.9         0.0 ±         0.0         -0.1 ±         0.9         -22.7 ±         8.6         GA00857           FA3         -9.1         66.4         -1.1         0.2 ±         0.4         0.4 ±         1.3         -1.77 ±         9.6         GA00856           FA4         22.9         913.1         -0.9         0.2 ±         0.4         0.4 ±         1.1         -24.1 ±         8.9         GA00856           FB2         -9.1         302.0         -0.6 ±         0.0 ±         0.0 ±         1.1         -24.1 ±         8.9         GA00856           FC1         1.6         84.8         -0.7         0.0 ±         0.0         0.5 ±         1.2         -23.2 ±         1.2         23.2 ±         1.2         23.2 ±         1.2         23.2 ±         1.2         23.2 ±         1.2         6.0 6.0         0.5 ±         1.2         -23.2 ±         1.1         0.2 ±         2.1 ±                                                                                                                                                                                                                                                                                                                                                                                                                                                | (Bkgd =>)  | 1.7         | 149.47      | 5.00      | 0.0                       | 1.0                  | 30.6             |         |
| OA         NA         NA         NA         O.0 ±         0.0         0.5 ±         0.6         -22 ±         5.4         GA00650           FA1         -0.1         202.3         -0.9         0.0 ±         0.0         -0.1 ±         0.9         -22.3 ±         9.4         GA00651           FA2         1.6         202.3         -0.9         0.0 ±         0.0         -0.1 ±         0.9         -22.1 ±         8.8         GA00657           FA3         -9.1         65.4         -1.1         0.2 ±         0.4         0.4 ±         1.3         -1.7 ±         9.8         GA00656           FB4         -2.1         302.0         -0.5         -0.1 ±         0.0         0.2 ±         0.8         -2.0 ± ±         8.9         GA00656           FB4         -9.1         268.4         -0.7         0.0 ±         0.0         -0.2 ±         0.8         -2.0 ± ±         8.9         GA00657           FC1         1.6         226.1         -0.9         0.0 ±         0.0         -0.2 ±         0.8         -2.0 ± ±         1.1         -2.0 ± ±         8.9         GA00657           FC2         -9.1         268.8         -1.1         0.0 ±         0.0 ± <td>(MDA =&gt;)</td> <td>54</td> <td>401</td> <td></td> <td>0.6</td> <td>1.0</td> <td>26.5</td> <td></td>                                                                                                                                                                                                                                                                                                                                            | (MDA =>)   | 54          | 401         |           | 0.6                       | 1.0                  | 26.5             |         |
| FA1         -9.1         257.7         -0.9         0.0±         0.0         -0.3±         0.9         22.7±         8.8         GA00652           FA3         -8.1         69.4         -1.1         0.2±         0.4         0.1±         0.9         -22.7±         8.8         GA00652           FA4         22.9         313.1         -0.9         0.2±         0.4         0.1±         0.9         -17.7±         9.8         GA00653           FB1         12.3         291.0         -1.0         0.0±         0.0         -0.7±         1.7         1.7±         9.8         GA00655           FB3         -9.1         502.4         -0.5         0.0±         0.0         0.3±         1.1         -23.3±         9.3         GA00656           FC1         1.6         25.1         -0.9         0.0±         0.0         -0.7±         0.6         -21.8±         9.2         GA00657           FC2         -9.1         135.9         -1.1         0.0±         0.0         -0.7±         0.6         -21.8±         9.2         GA00657           FC2         -9.1         1.8         346.3         -0.2±         0.4         -0.2±         0.4         0.2±                                                                                                                                                                                                                                                                                                                                                                                                                                                                | QA         | N/A         | N/A         | N/A       | 0.0 ± 0.0                 | -0.6 ± 0.6           | -22.6 ± 8.6      | GA00650 |
| FA2         16         2023         0.9         0.01         0.01         0.9         2274         8.8         GA00652           FA3         -9.1         69.4         -1.1         0.22         0.4         0.41         1.3         -17.71         9.8         GA00653           FA4         22.9         313.1         0.9         0.22         0.4         0.11         0.9         -17.72         9.8         GA006554           FB1         12.3         291.1         0.00         0.00         0.7         1.7.71         9.8         GA006556           FB2         -9.1         302.0         -0.6         0.01         0.02         0.0         0.21         1.1         -24.11         8.9         GA006556           FB2         -9.1         368.5         -0.7         0.02         0.0         -0.7         1.0.6         -21.8         9.2         GA006659           FC2         -9.1         368.5         -0.9         0.22         0.4         0.11         1.0         -21.92         9.1         GA006654           FC3         -9.1         268.8         -1.1         0.02         0.0         -0.52         0.8         -24.22         9.2         GA0066                                                                                                                                                                                                                                                                                                                                                                                                                                                           | FA1        | -9.1        | 257.7       | -0.9      | 0.0 ± 0.0                 | -0.3 ± 0.9           | -22.3 ± 9.4      | GA00651 |
| FA3       -9.1       0.9.4       -1.1       0.2 ± 0.4       0.4 ± 0.3       -1.7. ± 9.6       GA00853         FA4       22.9       313.1       -0.9       0.2 ± 0.4       0.1 ± 0.9       -17.7 ± 9.6       GA00854         FB1       12.3       291.0       -1.0       0.0 ± 0.0       0.3 ± 1.1       -24.1 ± 8.9       GA00855         FB2       -9.1       302.0       -0.6       0.0 ± 0.0       0.0 ± 1.1       -24.1 ± 8.9       GA00857         FB3       -9.1       268.8       -0.7       0.0 ± 0.0       -0.2 ± 0.8       -20.0 ± 8.9       GA00857         FC2       -9.1       135.9       -1.1       0.0 ± 0.0       -0.7 ± 0.6       -21.8 ± 9.2       GA00650         FC2       -9.1       135.9       -1.1       0.0 ± 0.0       -0.7 ± 0.6       -21.8 ± 9.2       GA00650         FC4       1.6       268.8       -1.1       0.0 ± 0.0       -0.4 ± 0.7       -19.8 ± 9.1       GA006657         FD2       -9.1       203.3       -0.2       0.2 ± 0.4       -0.1 ± 1.0       -21.0 ± 9.9       GA006657         FD3       -9.1       203.3       -0.2       0.2 ± 0.4       -0.1 ± 1.0       -21.7 ± 9.8       GA006667         FE2 <t< td=""><td>FA2</td><td>1.6</td><td>202.3</td><td>-0.9</td><td>0.0 ± 0.0</td><td>-0.1 ± 0.9</td><td>-22.7 ± 8.8</td><td>GA00652</td></t<>                                                                                                                                                                                                                                                                                                                                           | FA2        | 1.6         | 202.3       | -0.9      | 0.0 ± 0.0                 | -0.1 ± 0.9           | -22.7 ± 8.8      | GA00652 |
| FAA         22.9         313.1         -0.9         0.2±         0.4         0.1±         0.9         -177.±         9.8         GA00654           FB1         12.3         291.0         -1.0         0.0±         0.0         -0.7±         0.7         -177.±         9.8         GA00655           FB2         -9.1         302.0         -0.6         0.0±         0.0         0.1±         1.2         2.41±         8.9         GA00656           FB4         -9.1         268.8         -0.7         0.0±         0.0         0.0±         1.1         2.32±         1.1         GA00656           FC2         -8.1         136.5         0.9         0.2±         0.4         0.7         0.6         -21.8±         9.2         GA00661           FC3         -8.1         368.5         -0.9         0.2±         0.4         0.1±         1.0         -21.0±         1.0         GA00665           FC3         -8.1         368.5         -0.9         0.2±         0.4         0.1±         1.0         -21.0±         1.0         GA00665           FD1         1.6         346.3         -0.4         0.2±         0.4         0.0.5±         1.1         -20.0± <td>FA3</td> <td>-9.1</td> <td>69.4</td> <td>-1.1</td> <td>0.2 ± 0.4</td> <td>0.4 ± 1.3</td> <td>-17.7 ± 9.6</td> <td>GA00653</td>                                                                                                                                                                                                                                                                                                                            | FA3        | -9.1        | 69.4        | -1.1      | 0.2 ± 0.4                 | 0.4 ± 1.3            | -17.7 ± 9.6      | GA00653 |
| FB1         12.3         2910         -1.0         0.0 ±         0.0         -0.7         0.7         -1.7.7 ±         9.8         GA00656           FB2         -9.1         302.0         -0.6         0.0 ±         0.0         0.3 ±         1.1         -24.1         8.9         GA00656           FB3         -9.1         268.4         -0.7         0.0 ±         0.0         -1.1         -23.3 ±         9.3         GA00657           FC1         1.6         25.1         -0.9         0.0 ±         0.0         -0.2 ±         0.8         -20.0 ±         8.9         GA006669           FC2         -9.1         368.5         -0.9         0.2 ±         0.4         -0.2 ±         1.1         -21.9 ±         9.4         GA006661           FC2         -9.1         286.8         -0.2         0.2 ±         0.4         -0.1 ±         1.1         -21.9 ±         9.6         GA00665           FD2         -9.1         226.3         -0.2 ±         0.4         -0.1 ±         1.0         -21.9 ±         9.6         GA00665           FE3         -9.1         226.3         -0.2 ±         0.4         -0.8 ±         0.8         -23.4 ±         9.8         G                                                                                                                                                                                                                                                                                                                                                                                                                                                  | FA4        | 22.9        | 313.1       | -0.9      | 0.2 ± 0.4                 | 0.1 ± 0.9            | -17.7 ± 9.8      | GA00654 |
| FB2         9.1         302.0         -0.6         0.0 ±         0.0 ±         0.0 ±         1.1         -24.1 ±         8.9         GA00855           FB3         -9.1         69.4         -0.5         -0.1 ±         0.0         0.0 ±         1.1         -23.3 ±         9.3         GA00855           FC1         1.6         25.1         -0.9         0.0 ±         0.0         -0.2 ±         0.8         -20.0 ±         8.9         GA00855           FC2         -9.1         135.9         -1.1         0.0 ±         0.0         -0.7 ±         0.6         -23.2 ±         1.2         -23.2 ±         1.2         GA008661           FC2         -9.1         136.5         -0.9         0.2 ±         0.4         -0.2 ±         1.1         -21.0 ±         1.6         GA00663           FD2         -9.1         288.8         -0.2         0.2 ±         0.4         -0.1 ±         1.1         20.1 ±         1.0         GA00665           FD2         -9.1         213.4         -0.2         0.2 ±         0.4         -0.8 ±         0.8         -26.0 ±         9.9         GA00665           FE1         -9.1         246.6         0.0         0.0 ±         -                                                                                                                                                                                                                                                                                                                                                                                                                                                  | FB1        | 12.3        | 291.0       | -1.0      | 0.0 ± 0.0                 | -0.7 ± 0.7           | -17.7 ± 9.8      | GA00655 |
| FB3         -9.1         69.4         -0.6         -0.1±         0.0         0.0±         1.1         -23.3±         9.3         GA00657           FB4         -9.1         268.8         -0.7         0.0±         0.0         -0.2±         0.8         -20.0±         8.9         GA006658           FC1         1.6         25.1         -0.9         0.0±         0.0         -0.7±         0.6         -21.8±         9.2         GA00659           FC2         9.1         368.5         -0.9         0.2±         0.4         -0.2±         1.1         -21.9±         9.4         GA00661           FC2         1.6         368.3         -0.4         0.2±         0.4         -0.1±         1.1         -21.0±         9.1         GA006657           FD2         -9.1         288.8         -0.2         0.2±         0.4         -0.8         0.8         -26.0±         9.9         GA006657           FE1         -9.1         246.6         0.0         0.0±         0.0         -0.5±         0.7         -22.9±         9.9         GA006657           FE2         -9.1         246.6         0.0         0.0±         0.0         -0.5±         0.7         -22.                                                                                                                                                                                                                                                                                                                                                                                                                                                           | FB2        | -9.1        | 302.0       | -0.6      | 0.0 ± 0.0                 | 0.3 ± 1.1            | -24.1 ± 8.9      | GA00656 |
| FB4         -9.1         288.8         -0.7         0.0±         0.0         -0.2±         0.8         -20.0±         8.9         GA00655           FC1         1.6         25.1         -0.9         0.0±         0.0         0.5±         1.2         -23.2±         1.1.2         GA006659           FC2         -9.1         368.5         -0.9         0.2±         0.4         -0.2±         1.1         -20.5±         9.6         GA006662           FC2         -9.1         366.5         -0.9         0.2±         0.4         -0.2±         1.1         -20.5±         9.6         GA006662           FD1         1.6         346.3         -0.4         0.2±         0.4         0.1±         1.0         -21.0±         1.0.1         GA006662           FD3         -9.1         284.8         -0.2         0.2±         0.4         0.1±         1.0         -21.0±         1.0.1         GA00665           FE4         -9.1         213.4         -0.2         0.2±         0.4         0.15±         0.8         -24.2±         9.2         GA00667           FE3         -9.1         246.6         0.0         0.0±         0.0         -0.5±         0.7         <                                                                                                                                                                                                                                                                                                                                                                                                                                                       | FB3        | -9.1        | 69.4        | -0.5      | -0.1 ± 0.0                | 0.0 ± 1.1            | -23.3 ± 9.3      | GA00657 |
| FC1         1.6         25.1 $-0.9$ $0.0 \pm 0.0$ $0.5 \pm 1.2$ $-23.2 \pm 11.2$ GA006659           FC2 $-9.1$ 1368.5 $-1.1$ $0.0 \pm 0.0$ $-0.7 \pm 0.6$ $-21.8 \pm 9.2$ GA00661           FC3 $-9.1$ 368.5 $-0.9$ $0.2 \pm 0.4$ $0.1 \pm 1.1$ $-21.8 \pm 9.2$ GA00661           FC4         1.6         368.5 $-0.4$ $0.2 \pm 0.4$ $0.1 \pm 1.1$ $-21.0 \pm 9.4$ GA00662           FD1         1.6         348.3 $-0.4$ $0.2 \pm 0.4$ $0.1 \pm 1.1$ $-21.0 \pm 9.6$ GA00667           FD2 $-9.1$ 202.3 $-0.2$ $0.2 \pm 0.4$ $0.1 \pm 1.1$ $-26.0 \pm 9.9$ GA00667           FE1 $-9.1$ 213.4 $-0.2$ $0.4 \pm 0.6$ $-0.8 \pm 0.8$ $-24.2 \pm 2.6$ $20.0 \pm 9.0$ $0.3 \pm 1.0$ $21.7 \pm 1.1$ $7.40.0 \pm 2.6$ FE3 $-9.1$ 279.9 $-0.2$ $0.4 \pm 0.6$ $-0.8 \pm 0.8$ $-0.2 \pm 4.4$ $9.8$ GA00667           WA3A $-9.1$ $279.9$ $-0.2$ $0.0 \pm 0.0$ </td <td>FB4</td> <td>-9.1</td> <td>268.8</td> <td>-0.7</td> <td>0.0 ± 0.0</td> <td>-0.2 ± 0.8</td> <td>-20.0 ± 8.9</td> <td>GA00658</td>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | FB4        | -9.1        | 268.8       | -0.7      | 0.0 ± 0.0                 | -0.2 ± 0.8           | -20.0 ± 8.9      | GA00658 |
| $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | FC1        | 1.6         | 25.1        | -0.9      | 0.0 ± 0.0                 | 0.5 ± 1.2            | -23.2 ± 11.2     | GA00659 |
| FC3         -9.1         388.5         -0.9         0.2 ± 0.4         -0.2 ± 1.1         -21.9 ± 9.4         GA00661           FC4         1.6         268.8         -1.1         0.0 ± 0.0         -0.4 ± 0.7         -19.6 ± 9.1         GA00662           FD1         1.6         346.3         -0.4         0.2 ± 0.4         0.1 ± 1.0         -21.0 ± 10.1         GA00662           FD2         -9.1         202.3         -0.2         0.2 ± 0.4         -0.8 ± 0.8         -26.0 ± 9.9         GA006667           FD4         -9.1         213.4         -0.2         0.4         -0.8 ± 0.8         -24.2 ± 9.2         GA006667           FE1         -9.1         213.4         -0.2         0.4 ± 0.6         -0.8 ± 0.8         -24.2 ± 9.2         GA006667           FE2         -9.1         191.3         -0.1         0.0 ± 0.0         -0.5 ± 0.8         -24.2 ± 9.2         GA006670           WA2A         1.6         80.5         -0.7         0.0 ± 0.0         -0.3 ± 1.0         -21.7 ± 11.7         GA00677           WA3A         -9.1         47.3         -0.5         -0.1 ± 0.0         0.0 ± 1.1         -20.5 ± 9.6         GA00677           WA3A         -9.1         346.3         -1.3                                                                                                                                                                                                                                                                                                                                                                                                               | FC2        | -9.1        | 135.9       | -1.1      | 0.0 ± 0.0                 | -0.7 ± 0.6           | -21.8 ± 9.2      | GA00660 |
| FC4         1.8         268.8         -1.1         0.0±         0.0         -0.4±         0.7         -19.6±         9.1         GA00662           FD1         1.6         346.3         -0.4         0.2±         0.4         0.1±         1.1         -20.5±         9.6         GA00663           FD2         -9.1         268.8         -0.2         0.2±         0.4         -0.8±         0.8         -26.0±         9.9         GA00665           FD4         -9.1         248.6         -0.2         0.0±         0.0         -0.5±         1.1         -26.0±         9.9         GA00666           FE1         -9.1         246.6         0.0         0.0±         0.0         -0.5±         0.8         -22.9±         9.2         GA00666           FE2         -9.1         246.6         0.0±         0.0         -0.5±         0.7         -22.9±         9.9         GA00667           VA1A         -9.1         313.1         -0.2         0.0±         0.0         -0.7         -16.6±         8.9         GA00677           VA3A         -9.1         47.3         -0.5         -0.1±         0.0         0.0±         1.1         -23.0±         8.6         GA                                                                                                                                                                                                                                                                                                                                                                                                                                                           | FC3        | -9.1        | 368.5       | -0.9      | 0.2 ± 0.4                 | -0.2 ± 1.1           | -21.9 ± 9.4      | GA00661 |
| FD1         1.6         346.3         -0.4         0.2 ±         0.4         0.1 ±         1.1         -20.5 ±         9.6         GA00663           FD2         -9.1         288.8         -0.2         0.2 ±         0.4         0.1 ±         1.0         -21.0 ±         10.1         GA00664           FD3         -9.1         202.3         -0.2         0.2 ±         0.4         -0.8 ±         0.8         -26.0 ±         9.9         GA006664           FE1         -9.1         246.6         0.0         0.0 ±         0.0         -0.5 ±         0.7         -22.9 ±         9.9         GA00667           FE2         -9.1         191.3         -0.1         0.0 ±         0.0         -0.5 ±         0.7         -22.9 ±         9.9         GA00667           FE3         -9.1         313.1         -0.2         0.0 ±         0.0         -0.3 ±         1.0         -21.7 ±         11.7         GA00670           WA1A         -9.1         41.3         -0.6         -0.1 ±         0.0         0.5 ±         1.1         -20.9 ±         9.0         GA00673           WA2A         1.6         80.5         -0.7         0.0 ±         0.0         -0.4 ±                                                                                                                                                                                                                                                                                                                                                                                                                                                           | FC4        | 1.6         | 268.8       | -1.1      | 0.0 ± 0.0                 | -0.4 ± 0.7           | -19.6 ± 9.1      | GA00662 |
| FD2         -9.1         268.8         -0.2         0.2±         0.4         0.1±         1.0         -21.0±         10.1         GA00664           FD3         -9.1         202.3         -0.2         0.2±         0.4         -0.8±         0.8         -28.0±         9.9         GA00665           FD4         -9.1         213.4         -0.2         0.0±         0.0         0.5±         1.1         -26.0±         9.9         GA006657           FE1         -9.1         246.6         0.0         0.0±         0.0         -0.5±         0.7         -22.9±         9.9         GA006670           FE3         -9.1         279.9         -0.2         0.4±         0.6         -0.8±         0.8         -24.2±         9.8         GA00670           WA1A         -9.1         41.3         -0.6         0.0±         0.0         -0.7 ±         0.7         -16.6±         8.9         GA00673           WA3A         -9.1         47.3         -0.5         -0.1±         0.0         0.5±         1.1         -20.9±         9.0         GA006767           WA3A         12.3         25.1         -1.2         0.0±         0.0         -0.3±         0.2 <t< td=""><td>FD1</td><td>1.6</td><td>346.3</td><td>-0.4</td><td>0.2 ± 0.4</td><td>0.1 ± 1.1</td><td><math>-20.5 \pm 9.6</math></td><td>GA00663</td></t<>                                                                                                                                                                                                                                                                                                        | FD1        | 1.6         | 346.3       | -0.4      | 0.2 ± 0.4                 | 0.1 ± 1.1            | $-20.5 \pm 9.6$  | GA00663 |
| FD3-9.1202.3-0.2 $0.2 \pm 0.4$ $-0.8 \pm 0.8$ $-26.0 \pm 9.9$ GA00665FD4-9.1213.4-0.2 $0.0 \pm 0.0$ $0.5 \pm 1.1$ $-26.0 \pm 9.9$ GA006667FE1-9.1246.6 $0.0$ $0.0 \pm 0.0$ $-0.5 \pm 0.8$ $-24.2 \pm 9.2$ GA00667FE2-9.1191.3 $-0.1$ $0.0 \pm 0.0$ $-0.5 \pm 0.7$ $-22.9 \pm 9.9$ GA00668FE3-9.1279.9 $-0.2$ $0.4 \pm 0.6$ $-0.8 \pm 0.8$ $-23.4 \pm 9.8$ GA00669FE4-9.1313.1 $-0.2$ $0.0 \pm 0.0$ $0.3 \pm 1.0$ $-21.7 \pm 11.7$ GA00671WA1A-9.141.3 $-0.6$ $0.0 \pm 0.0$ $0.5 \pm 1.1$ $-20.9 \pm 9.0$ GA006672WA2A1.680.5 $-0.7$ $0.0 \pm 0.0$ $0.5 \pm 1.1$ $-20.9 \pm 9.0$ GA00674WA3A-9.147.3 $-0.5$ $-0.1 \pm 0.0$ $0.0 \pm 1.1$ $-23.0 \pm 8.6$ GA00674WA4A12.3-8.1 $-0.7$ $0.0 \pm 0.0$ $-0.3 \pm 0.8$ $-26.8 \pm 9.5$ GA00674WA4B12.325.1 $-1.3$ $0.0 \pm 0.0$ $-0.3 \pm 0.8$ $-26.8 \pm 9.5$ GA00674WA3B-9.1346.3 $-1.3$ $0.0 \pm 0.0$ $-0.3 \pm 0.8$ $-26.8 \pm 9.5$ GA00677WA4B1.6102.6 $-1.2$ $0.0 \pm 0.0$ $-0.8 \pm 0.4$ $-17.2 \pm 9.9$ GA00677WA4B1.6102.6 $-1.2$ $0.0 \pm 0.0$ $-0.8 \pm 0.4$ $-17.2 \pm 9.9$ GA00677WA3B-9.130.6 $-1.3$ </td <td>FD2</td> <td>-9.1</td> <td>268.8</td> <td>-0.2</td> <td>0.2 ± 0.4</td> <td>0.1 ± 1.0</td> <td><math>-21.0 \pm 10.1</math></td> <td>GA00664</td>                                                                                                                                                                                                                                                                                                                                                                                                                          | FD2        | -9.1        | 268.8       | -0.2      | 0.2 ± 0.4                 | 0.1 ± 1.0            | $-21.0 \pm 10.1$ | GA00664 |
| FDA         -9.1         213.4         -0.2         0.0 ±         0.0         0.5 ±         1.1         -26.0 ±         9.9         GA00666           FE1         -9.1         246.6         0.0         0.0 ±         0.0         -0.5 ±         0.8         -24.2 ±         9.2         GA00667           FE2         -9.1         191.3         -0.1         0.0 ±         0.0         -0.5 ±         0.7         -22.9 ±         9.9         GA00667           WA1A         -9.1         313.1         -0.2         0.0 ±         0.0         0.3 ±         1.0         -21.7 ±         11.7         GA00670           WA2A         1.6         80.5         -0.7         0.0 ±         0.0         -0.5 ±         1.1         -20.9 ±         9.0         GA00672           WA3A         12.3         -8.1         -0.7         0.0 ±         0.0         -0.4 ±         0.7         -19.5 ±         9.4         GA00672           WA3A         12.3         -8.1         -0.7         0.0 ±         0.0         -0.4 ±         0.7         -19.5 ±         9.4         GA00674           WA3B         16.1         12.3         -25.1         -1.3         0.0 ±         0.0 ± <td< td=""><td>FD3</td><td>-9.1</td><td>202.3</td><td>-0.2</td><td><math>0.2 \pm 0.4</math></td><td><math>-0.8 \pm 0.8</math></td><td><math>-26.0 \pm 9.9</math></td><td>GA00665</td></td<>                                                                                                                                                                                                                                                              | FD3        | -9.1        | 202.3       | -0.2      | $0.2 \pm 0.4$             | $-0.8 \pm 0.8$       | $-26.0 \pm 9.9$  | GA00665 |
| FET         -9.1         246.6         0.0         0.0 ±         0.0         -0.5 ±         0.8         -24.2 ±         9.2         GA00667           FE2         -9.1         191.3         -0.1         0.0 ±         0.0         -0.5 ±         0.7         -22.9 ±         9.9         GA00668           FE3         -9.1         279.9         -0.2         0.4 ±         0.6         -0.8 ±         0.8         -23.4 ±         9.8         GA00667           WA1A         -9.1         -41.3         -0.6         0.0 ±         0.0         -0.7 ±         0.7         -16.6 ±         8.9         GA00671           WA3A         -9.1         47.3         -0.5         -0.1 ±         0.0         0.5 ±         1.1         -23.0 ±         8.6         GA00672           WA3A         -9.1         47.3         -0.5         -0.1 ±         0.0         0.5 ±         1.2         -17.4 ±         9.1         GA00677           WA4A         12.3         25.1         -1.2         0.0 ±         0.0         -0.5 ±         0.8         -26.8 ±         9.5         GA00677           WA4B         1.6         102.6         -1.2         0.0 ±         0.0         -0.1 ± <t< td=""><td>FD4</td><td>-9.1</td><td>213.4</td><td>-0.2</td><td><math>0.0 \pm 0.0</math></td><td><math>0.5 \pm 1.1</math></td><td><math>-26.0 \pm 9.9</math></td><td>GA00666</td></t<>                                                                                                                                                                                                                                                                | FD4        | -9.1        | 213.4       | -0.2      | $0.0 \pm 0.0$             | $0.5 \pm 1.1$        | $-26.0 \pm 9.9$  | GA00666 |
| FEZ         -9.1         1913         -0.1         0.0 ±         0.0         -0.5 ±         0.7         22.9 ±         9.9         GA00668           FE3         -9.1         279.9         -0.2         0.4 ±         0.6         -0.8 ±         0.8         23.4 ±         9.8         GA00669           FE4         -9.1         313.1         -0.2         0.0 ±         0.0         0.3 ±         1.0         21.7 ±         11.7         GA00670           WA1A         -9.1         -41.3         -0.6         0.0 ±         0.0         0.5 ±         1.1         -20.9 ±         9.0         GA00671           WA2A         1.6         80.5         -0.7         0.0 ±         0.0         0.5 ±         1.1         -20.9 ±         9.0         GA00673           WA3A         -9.1         47.3         -0.5         -0.1 ±         0.0         0.0 ±         1.1         -23.0 ±         8.6         GA00673           WA4B         1.2.3         25.1         -1.2         0.0 ±         0.0         -0.4 ±         1.1         -28.0 ±         9.7         GA00677           WA4B         1.6         102.6         -1.2         0.0 ±         0.0 ±         0.0 ±         1.                                                                                                                                                                                                                                                                                                                                                                                                                                                  | FF1        | -9.1        | 246.6       | 0.0       | $0.0 \pm 0.0$             | $-0.5 \pm 0.8$       | -24.2 ± 9.2      | GA00667 |
| FE3         9.1         27.9         0.2         0.4         0.6         0.8         0.8         23.4         9.8         GA00669           FE4         -9.1         313.1         -0.2         0.0         0.0         0.3         1.0         -21.7         11.7         GA00670           WA1A         -9.1         -41.3         -0.6         0.0         0.0         0.5         1.1         -20.9         9.0         GA00671           WA2A         1.6         80.5         -0.7         0.0         0.0         0.5         1.1         -20.9         9.0         GA00673           WA3A         -9.1         47.3         -0.5         -0.1         0.0         0.0         1.1         -23.0         8.6         GA00673           WA4A         12.3         -8.1         -0.7         0.0         0.0         -0.3         1.0         23.0         8.6         GA00675           WA2B         -9.1         346.3         -1.3         0.0         0.0         -0.3         28.2         28.2         9.7         GA00677           WA2B         1.6         102.6         -1.2         0.0         -0.0         1.1         -28.0         9.7         GA00677                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | FF2        | -9.1        | 191.3       | -0.1      | $0.0 \pm 0.0$             | $-0.5 \pm 0.7$       | -229+99          | GA00668 |
| FE4-9.1313.1-0.20.0 $\pm$ 0.00.3 $\pm$ 1.0-21.7 $\pm$ 11.7GA00670WA1A-9.1-41.3-0.60.0 $\pm$ 0.0-0.7 $\pm$ 0.7-16.6 $\pm$ 8.9GA00671WA2A1.680.5-0.70.0 $\pm$ 0.00.5 $\pm$ 1.1-22.9 $\pm$ 9.0GA00672WA3A-9.147.3-0.5-0.1 $\pm$ 0.00.0 $\pm$ 1.1-23.0 $\pm$ 8.6GA00673WA4A12.3-8.1-0.70.0 $\pm$ 0.0-0.4 $\pm$ 0.7-19.5 $\pm$ 9.4GA00674WA1B12.325.1-1.20.0 $\pm$ 0.0-0.3 $\pm$ 0.8-26.8 $\pm$ 9.5GA006764WA3B-9.1346.3-1.30.0 $\pm$ 0.0-0.3 $\pm$ 0.8-26.8 $\pm$ 9.5GA006776WA4B1.6102.6-1.20.0 $\pm$ 0.0-0.1 $\pm$ 1.0-18.3 $\pm$ 9.7GA006776WA4B1.6102.6-1.20.0 $\pm$ 0.0-0.1 $\pm$ 1.0-18.3 $\pm$ 9.0GA00679WB2A-9.191.6-1.40.0 $\pm$ 0.0-0.7 $\pm$ 0.6-17.9 $\pm$ 8.8GA00680WB2A-9.191.6-1.40.0 $\pm$ 0.0-1.20.6-17.9 $\pm$ 8.8GA00680WB2A-9.191.6-1.40.0 $\pm$ 0.0-0.5 $\pm$ 0.7-25.6 $\pm$ 10.8GA00682WB2A-9.191.6-1.40.0 $\pm$ </td <td>FE3</td> <td>-9.1</td> <td>279.9</td> <td>-0.2</td> <td>04+ 06</td> <td>-0.8 + 0.8</td> <td>-234+ 98</td> <td>GA00669</td>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | FE3        | -9.1        | 279.9       | -0.2      | 04+ 06                    | -0.8 + 0.8           | -234+ 98         | GA00669 |
| VA1A         -0.1         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         0.0         1.0         1.1         22.0         ±         8.0         GA00672           WA3A         -9.1         47.3         -0.5         -0.1         0.0         0.0         1.1         -23.0         ±         8.6         GA00673           WA4A         12.3         -8.1         -0.7         0.0         0.0         -0.4         0.7         -19.5         9.4         GA00676           WA1B         12.3         25.1         -1.2         0.0         0.0         -0.3         1.8         -26.8         9.5         GA00676           WA2B         -9.1         390.6         -1.3         -0.1         0.0         -0.2         1.1         -28.0         9.7         GA00677           WA2A         -9.1         91.6         -1.4         0.0         -0.1         -1.1         0.0         -1.2         0.6         -17.2         9.9         G                                                                                                                                                                                                                                                                                                                                                                                                                                                             | FFA        | -9.1        | 313.1       | -0.2      | 0.11 0.0                  | $0.3 \pm 1.0$        | -217 ± 117       | GA00670 |
| NAA         Description         Description <thdescription< th=""> <thdes< td=""><td>WAIA</td><td>-9.1</td><td>-41.3</td><td>-0.6</td><td><math>0.0 \pm 0.0</math></td><td><math>-0.7 \pm 0.7</math></td><td>-166 + 89</td><td>GA00671</td></thdes<></thdescription<> | WAIA       | -9.1        | -41.3       | -0.6      | $0.0 \pm 0.0$             | $-0.7 \pm 0.7$       | -166 + 89        | GA00671 |
| WA3A         -9.1         47.3         -0.5         -0.1 ± 0.0         0.0 ± 1.1         -23.0 ± 8.6         GA00673           WA4A         12.3         -8.1         -0.7         0.0 ± 0.0         -0.4 ± 0.7         -19.5 ± 9.4         GA00674           WA1B         12.3         25.1         -1.2         0.0 ± 0.0         -0.5 ± 1.2         -17.4 ± 9.1         GA00675           WA2B         -9.1         346.3         -1.3         0.0 ± 0.0         -0.3 ± 0.8         -26.8 ± 9.5         GA00676           WA3B         -9.1         390.6         -1.3         -0.1 ± 0.0         0.0 ± 1.1         -28.0 ± 9.7         GA00677           WA4B         1.6         102.6         -1.2         0.0 ± 0.0         -0.8 ± 0.4         -17.2 ± 9.9         GA00678           WB1A         -9.1         25.1         -1.3         0.0 ± 0.0         -0.1 ± 1.0         -18.3 ± 9.0         GA00679           WB2A         -9.1         91.6         -1.4         0.0 ± 0.0         -0.1 ± 1.0         -18.3 ± 9.0         GA00680           WB3A         -9.1         91.6         -1.4         0.0 ± 0.0         0.1 ± 0.9         9.1 3.9 ± 9.0         GA00681           WB4A         1.6         -196.4         -1.1                                                                                                                                                                                                                                                                                                                                                                                                        | WA2A       | 1.6         | 80.5        | -0.7      | 0.0 ± 0.0                 | $0.5 \pm 1.1$        | -209 + 90        | GA00672 |
| No.         No. <td>WA3A</td> <td>-9.1</td> <td>47.3</td> <td>-0.5</td> <td><math>-0.1\pm0.0</math></td> <td><math>0.0 \pm 1.1</math></td> <td>-23.0 ± 8.6</td> <td>GA00673</td>                                                                                                                                                                                                                                                                          | WA3A       | -9.1        | 47.3        | -0.5      | $-0.1\pm0.0$              | $0.0 \pm 1.1$        | -23.0 ± 8.6      | GA00673 |
| WA1B         12.3         25.1         -1.2         0.0±         0.0         0.5±         1.2         -17.4±         9.1         GA00675           WA2B         -9.1         346.3         -1.3         0.0±         0.0         -0.3±         0.8         -26.8±         9.5         GA00676           WA3B         -9.1         390.6         -1.3         -0.1±         0.0         0.0±         1.1         -28.0±         9.7         GA00677           WA4B         1.6         102.6         -1.2         0.0±         0.0         -0.1±         1.0         -18.3±         9.0         GA00679           WB1A         -9.1         25.1         -1.3         0.0±         0.0         -0.1±         1.0         -18.3±         9.0         GA00678           WB2A         -9.1         91.6         -1.4         0.0±         0.0         -0.1±         1.0         -18.3±         9.0         GA00680           WB3A         -9.1         -30.3         -1.3         0.0±         0.0         -1.2±         0.6         -15.0±         9.4         GA00681           WB4A         1.6         -196.4         -1.1         0.0±         0.0         -0.5±         0.7         <                                                                                                                                                                                                                                                                                                                                                                                                                                                       | WA4A       | 12.3        | -8.1        | -0.7      | 0.0 ± 0.0                 | $-0.4 \pm 0.7$       | -19.5 ± 9.4      | GA00674 |
| WA2B         -9.1         346.3         -1.3         0.0 ± 0.0         -0.3 ± 0.8         -26.8 ± 9.5         GA00676           WA3B         -9.1         390.6         -1.3         -0.1 ± 0.0         0.0 ± 1.1         -28.0 ± 9.7         GA00677           WA4B         1.6         102.6         -1.2         0.0 ± 0.0         -0.8 ± 0.4         -17.2 ± 9.9         GA00678           WB1A         -9.1         25.1         -1.3         0.0 ± 0.0         -0.1 ± 1.0         -18.3 ± 9.0         GA00679           WB2A         -9.1         91.6         -1.4         0.0 ± 0.0         -0.7 ± 0.6         -17.9 ± 8.8         GA00680           WB2A         -9.1         -30.3         -1.3         -0.1 ± 0.0         -1.2 ± 0.6         -15.0 ± 9.4         GA00681           WB4A         1.6         -196.4         -1.1         0.0 ± 0.0         0.1 ± 0.9         -13.9 ± 9.0         GA00682           WB5A         22.9         180.2         -0.8         0.0 ± 0.0         -0.5 ± 0.7         -25.6 ± 10.8         GA00683           WB4B         -9.1         202.3         -0.9         0.0 ± 0.0         -0.5 ± 0.7         -25.6 ± 10.8         GA006864           WB5B         -9.1         102.6         -0.                                                                                                                                                                                                                                                                                                                                                                                                   | WA1B       | 12.3        | 25.1        | -1.2      | 0.0 ± 0.0                 | 0.5 ± 1.2            | -17.4 ± 9.1      | GA00675 |
| WA3B         -9.1         390.6         -1.3         -0.1         0.0         1.1         -28.0         9.7         GA00677           WA4B         1.6         102.6         -1.2         0.0         0.0         ± 1.1         -28.0         9.7         GA00677           WA4B         1.6         102.6         -1.2         0.0         ± 0.0         -0.8         0.4         -17.2         9.9         GA00678           WB1A         -9.1         25.1         -1.3         0.0         ± 0.0         -0.1         1.0         -18.3         9.0         GA00679           WB2A         -9.1         91.6         -1.4         0.0         ± 0.0         -0.7         0.6         -17.9         # 8.8         GA00680           WB3A         -9.1         -30.3         -1.3         -0.1         0.0         -1.2         ± 0.6         -15.0         9.4         GA00682           WB3A         22.9         180.2         -0.8         0.0         ± 0.0         0.5         ± 1.2         -10.9         9.3         GA00683           WB2B         9.1         202.3         -0.9         0.0         ± 0.0         -0.5         ± 0.7         -25.6         ± 10.8                                                                                                                                                                                                                                                                                                                                                                                                                                                                | WA2B       | -9.1        | 346.3       | -1.3      | 0.0 ± 0.0                 | $-0.3 \pm 0.8$       | -26.8 ± 9.5      | GA00676 |
| WAAB         1.6         102.6         -1.2         0.0 ±         0.0         -0.8 ±         0.4         -17.2 ±         9.9         GA00678           WB1A         -9.1         25.1         -1.3         0.0 ±         0.0         -0.1 ±         1.0         -18.3 ±         9.0         GA00679           WB2A         -9.1         91.6         -1.4         0.0 ±         0.0         -0.7 ±         0.6         -17.9 ±         8.8         GA00680           WB3A         -9.1         -30.3         -1.3         -0.1 ±         0.0         -1.2 ±         0.6         -15.0 ±         9.4         GA00681           WB4A         1.6         -196.4         -1.1         0.0 ±         0.0         0.1 ±         0.9         -13.9 ±         9.0         GA00682           WB5A         22.9         180.2         -0.8         0.0 ±         0.0         0.5 ±         1.2         -10.9 ±         9.3         GA00683           WB4B         -9.1         202.3         -0.9         0.0 ±         0.0         -0.5 ±         0.7         -25.6 ±         10.8         GA00685           WB2B         12.3         324.2         -1.0         -0.1 ±         0.0         0.3 ±                                                                                                                                                                                                                                                                                                                                                                                                                                                    | WA3B       | -9.1        | 390.6       | -1.3      | -0.1 ± 0.0                | $0.0 \pm 1.1$        | $-28.0 \pm 9.7$  | GA00677 |
| WB1A         -9.1         25.1         -1.3         0.0 ±         0.0         -0.1 ±         1.0         -18.3 ±         9.0         GA00679           WB2A         -9.1         91.6         -1.4         0.0 ±         0.0         -0.1 ±         1.0         -18.3 ±         9.0         GA00679           WB2A         -9.1         -30.3         -1.3         -0.1 ±         0.0         -0.7 ±         0.6         -17.9 ±         8.8         GA00680           WB3A         -9.1         -30.3         -1.3         -0.1 ±         0.0         -1.2 ±         0.6         -15.0 ±         9.4         GA00681           WB4A         1.6         -196.4         -1.1         0.0 ±         0.0         0.1 ±         0.9         -13.9 ±         9.0         GA00682           WB5A         22.9         180.2         -0.8         0.0 ±         0.0         -0.5 ±         0.7         -25.6 ±         10.8         GA00683           WB2B         12.3         324.2         -1.0         -0.1 ±         0.0         -0.6 ±         0.9         -20.0 ±         9.4         GA00686           WB3B         -9.1         168.0         -0.7         0.0 ±         0.0         0.3 ±                                                                                                                                                                                                                                                                                                                                                                                                                                                 | WA4B       | 1.6         | 102.6       | -1.2      | $0.0 \pm 0.0$             | $-0.8 \pm 0.4$       | -17.2 ± 9.9      | GA00678 |
| WB2A         9.1         91.6         -1.4         0.0 ±         0.0         -0.7 ±         0.6         -17.9 ±         8.8         GA00680           WB3A         -9.1         -30.3         -1.3         -0.1 ±         0.0         -1.2 ±         0.6         -17.9 ±         8.8         GA00680           WB4A         1.6         -196.4         -1.1         0.0 ±         0.0         0.1 ±         0.9         -13.9 ±         9.0         GA00682           WB5A         22.9         180.2         -0.8         0.0 ±         0.0         -0.5 ±         0.7         -25.6 ±         10.8         GA00683           WB5A         22.9         180.2         -1.0         -0.1 ±         0.0         -0.5 ±         0.7         -25.6 ±         10.8         GA00683           WB2B         12.3         324.2         -1.0         -0.1 ±         0.0         -0.6 ±         0.9         -20.0 ±         9.4         GA00686           WB3B         -9.1         102.6         -0.9         0.0 ±         0.0         -0.5 ±         0.8         -22.7 ±         8.4         GA00686           WB4B         -9.1         -74.6         -0.7         0.0 ±         0.0         0.1 ±                                                                                                                                                                                                                                                                                                                                                                                                                                                | WB1A       | -9.1        | 25.1        | -1.3      | $0.0 \pm 0.0$             | $-0.1 \pm 1.0$       | -18.3 ± 9.0      | GA00679 |
| WB3A         -9.1         -30.3         -1.3         -0.1 ±         0.0         -1.2 ±         0.6         -15.0 ±         9.4         GA00681           WB4A         1.6         -196.4         -1.1         0.0 ±         0.0         0.1 ±         0.9         -13.9 ±         9.0         GA00682           WB5A         22.9         180.2         -0.8         0.0 ±         0.0         0.5 ±         1.2         -10.9 ±         9.3         GA00683           WB5B         22.9         180.2         -0.8         0.0 ±         0.0         -0.5 ±         0.7         -25.6 ±         10.8         GA00684           WB2B         12.3         324.2         -1.0         -0.1 ±         0.0         -0.6 ±         0.9         -20.0 ±         9.4         GA00685           WB3B         -9.1         102.6         -0.9         0.0 ±         0.0         0.3 ±         1.0         -17.0 ±         8.7         GA00686           WB4B         -9.1         158.0         -0.7         0.0 ±         0.0         0.1 ±         1.0         -14.5 ±         8.7         GA00687           WB4B         -9.1         .74.6         -0.7         0.0 ±         0.0         0.1 ±                                                                                                                                                                                                                                                                                                                                                                                                                                                   | WB2A       | -9.1        | 91.6        | -1.4      | $0.0 \pm 0.0$             | $-0.7 \pm 0.6$       | -17.9 ± 8.8      | GA00680 |
| WB4A         1.6         -196.4         -1.1         0.0 ±         0.0         0.1 ±         0.9         -13.9 ±         9.0         GA00682           WB5A         22.9         180.2         -0.8         0.0 ±         0.0         0.5 ±         1.2         -10.9 ±         9.3         GA00682           WB5A         22.9         180.2         -0.8         0.0 ±         0.0         0.5 ±         1.2         -10.9 ±         9.3         GA00683           WB1B         -9.1         202.3         -0.9         0.0 ±         0.0         -0.5 ±         0.7         -25.6 ±         10.8         GA00684           WB2B         12.3         324.2         -1.0         -0.1 ±         0.0         -0.6 ±         0.9         -20.0 ±         9.4         GA00685           WB3B         -9.1         102.6         -0.9         0.0 ±         0.0         -0.5 ±         0.8         -22.7 ±         8.4         GA006867           WB4B         -9.1         158.0         -0.7         0.0 ±         0.0         0.1 ±         1.0         -14.5 ±         8.7         GA006888           WC1A         1.6         191.3         -0.3         0.2 ±         0.0         0.1 ±                                                                                                                                                                                                                                                                                                                                                                                                                                                   | WB3A       | -9.1        | -30.3       | -1.3      | -01± 00                   | -12 ± 0.6            | -150 + 94        | GA00681 |
| WB5A         22.9         180.2         -0.8         0.0±         0.0         0.5±         1.2         -10.9±         9.3         GA00683           WB1B         -9.1         202.3         -0.9         0.0±         0.0         -0.5±         0.7         -25.6±         10.8         GA00684           WB2B         12.3         324.2         -1.0         -0.1±         0.0         -0.6±         0.9         -20.0±         9.4         GA00685           WB3B         -9.1         102.6         -0.9         0.0±         0.0         0.3±         1.0         -17.0±         8.7         GA00686           WB4B         -9.1         158.0         -0.7         0.0±         0.0         0.3±         1.0         -17.0±         8.7         GA00688           WB5B         -9.1         -74.6         -0.7         0.0±         0.0         0.1±         1.0         -14.5±         8.7         GA00688           WC1A         1.6         191.3         -0.3         0.2±         0.4         -0.2±         1.1         -15.7±         8.6         GA00699           WC2A         1.6         102.6         -0.1         0.0±         0.0         0.1±         1.0         <                                                                                                                                                                                                                                                                                                                                                                                                                                                       | WB4A       | 1.6         | -196.4      | -1.1      | 0.0 ± 0.0                 | 0.1 ± 0.9            | -13.9 ± 9.0      | GA00682 |
| WB1R       -9.1       202.3       -0.9       0.0 ±       0.0       -0.5 ±       0.7       -25.6 ±       10.8       GA00684         WB2B       12.3       324.2       -1.0       -0.1 ±       0.0       -0.6 ±       0.9       -20.0 ±       9.4       GA00685         WB3B       -9.1       102.6       -0.9       0.0 ±       0.0       -0.6 ±       0.9       -20.0 ±       9.4       GA00686         WB4B       -9.1       158.0       -0.7       0.0 ±       0.0       -0.5 ±       0.8       -22.7 ±       8.4       GA00686         WB5B       -9.1       -74.6       -0.7       0.0 ±       0.0       -0.1 ±       1.0       -14.5 ±       8.7       GA00688         WC1A       1.6       191.3       -0.3       0.2 ±       0.4       -0.2 ±       1.1       -15.7 ±       8.6       GA00689         WC2A       1.6       102.6       -0.1       0.0 ±       0.0       0.7 ±       1.1       -18.3 ±       8.4       GA00690         WC3A       -9.1       80.5       -0.1       0.0 ±       0.0       -0.1 ±       1.0       -17.8 ±       8.6       GA00692         WC4A       1.6       158.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | WB5A       | 22.9        | 180.2       | -0.8      | 0.0 ± 0.0                 | 0.5+ 12              | -10.9 + 9.3      | GA00683 |
| WB2B         12.3         324.2         -1.0         -0.1 ±         0.0         -0.6 ±         0.9         -20.0 ±         9.4         GA00685           WB3B         -9.1         102.6         -0.9         0.0 ±         0.0         0.3 ±         1.0         -17.0 ±         8.7         GA00686           WB4B         -9.1         158.0         -0.7         0.0 ±         0.0         -0.5 ±         0.8         -22.7 ±         8.4         GA00687           WB5B         -9.1         -74.6         -0.7         0.0 ±         0.0         0.1 ±         1.0         -14.5 ±         8.7         GA00688           WC1A         1.6         191.3         -0.3         0.2 ±         0.4         -0.2 ±         1.1         -15.7 ±         8.6         GA00690           WC2A         1.6         102.6         -0.1         0.0 ±         0.0         0.7 ±         1.1         -18.3 ±         8.4         GA00690           WC3A         -9.1         80.5         -0.1         0.0 ±         0.0         -0.1 ±         1.0         -17.8 ±         8.6         GA00693           WC4A         1.6         434.9         -0.1         0.0 ±         0.0         0.7 ±         <                                                                                                                                                                                                                                                                                                                                                                                                                                              | WB1B       | -9.1        | 202.3       | -0.9      | 00+00                     | -0.5 + 0.7           | -25.6 ± 10.8     | GA00684 |
| WB3B       -9.1       102.6       -0.9       0.0 ±       0.0       0.3 ±       1.0       -17.0 ±       8.7       GA00686         WB4B       -9.1       158.0       -0.7       0.0 ±       0.0       -0.5 ±       0.8       -22.7 ±       8.4       GA00686         WB5B       -9.1       -74.6       -0.7       0.0 ±       0.0       0.1 ±       1.0       -14.5 ±       8.7       GA00688         WC1A       1.6       191.3       -0.3       0.2 ±       0.4       -0.2 ±       1.1       -15.7 ±       8.6       GA00689         WC2A       1.6       102.6       -0.1       0.0 ±       0.0       0.7 ±       1.1       -18.3 ±       8.4       GA00690         WC3A       -9.1       80.5       -0.1       0.0 ±       0.0       0.1 ±       1.0       -12.8 ±       8.9       GA00691         WC4A       1.6       434.9       -0.1       0.0 ±       0.0       0.1 ±       1.0       -17.8 ±       8.6       GA00692         WC1B       -9.1       279.9       -0.1       0.2 ±       0.4       -0.4 ±       1.0       -25.8 ±       10.1       GA00693         WC2B       1.6       158.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | WB2B       | 12.3        | 324.2       | -1.0      | $-0.1\pm0.0$              | -06 + 09             | -20.0 + 9.4      | GA00685 |
| WB4B-9.1158.0-0.7 $0.0 \pm 0.0$ $-0.5 \pm 0.8$ $-22.7 \pm 8.4$ GA00687WB5B-9.1-74.6-0.7 $0.0 \pm 0.0$ $0.1 \pm 1.0$ $-14.5 \pm 8.7$ GA00688WC1A1.6191.3-0.3 $0.2 \pm 0.4$ $-0.2 \pm 1.1$ $-15.7 \pm 8.6$ GA00689WC2A1.6102.6-0.1 $0.0 \pm 0.0$ $0.7 \pm 1.1$ $-18.3 \pm 8.4$ GA00690WC3A-9.180.5-0.1 $0.0 \pm 0.0$ $0.7 \pm 1.1$ $-18.3 \pm 8.4$ GA00691WC4A1.6434.9-0.1 $0.0 \pm 0.0$ $0.1 \pm 1.0$ $-12.8 \pm 8.9$ GA00692WC1B-9.1279.9-0.1 $0.0 \pm 0.0$ $0.1 \pm 1.0$ $-17.8 \pm 8.6$ GA00693WC2B1.6158.0-0.1 $0.0 \pm 0.0$ $0.7 \pm 1.1$ $-25.8 \pm 10.1$ GA00693WC2B1.6346.3-0.2 $0.0 \pm 0.0$ $0.7 \pm 1.1$ $-16.2 \pm 8.6$ GA00694WC3B1.6346.3-0.2 $0.0 \pm 0.0$ $0.3 \pm 1.1$ $-16.2 \pm 8.6$ GA00695WC4B22.9169.1-0.1 $0.0 \pm 0.0$ $0.9 \pm 1.3$ $-18.3 \pm 8.4$ GA00696WD1A12.3191.3 $-0.2$ $-0.1 \pm 0.0$ $0.2 \pm 1.2$ $-12.3 \pm 8.9$ GA00697WD2A-9.1169.1 $-0.2$ $0.0 \pm 0.0$ $-0.4 \pm 0.7$ $-16.6 \pm 8.5$ GA00698WD3A-9.1324.2 $-0.2$ $0.0 \pm 0.0$ $-0.5 \pm 1.2$ $-18.3 \pm 8.4$ GA00699                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | WB3B       | -9.1        | 102.6       | -0.9      | 0.0 ± 0.0                 | 0.3 ± 1.0            | -17.0 ± 8.7      | GA00686 |
| WB5B-9.1-74.6-0.7 $0.0 \pm 0.0$ $0.1 \pm 1.0$ -14.5 \pm 8.7GA00688WC1A1.6191.3-0.3 $0.2 \pm 0.4$ -0.2 \pm 1.1-14.5 \pm 8.7GA00689WC2A1.6102.6-0.1 $0.0 \pm 0.0$ $0.7 \pm 1.1$ -15.7 \pm 8.6GA00690WC3A-9.180.5-0.1 $0.0 \pm 0.0$ $0.7 \pm 1.1$ -18.3 \pm 8.4GA00691WC4A1.6434.9-0.1 $0.0 \pm 0.0$ $-0.1 \pm 1.0$ -12.8 \pm 8.9GA00692WC1B-9.1279.9-0.1 $0.0 \pm 0.0$ $0.1 \pm 1.0$ -17.8 \pm 8.6GA00693WC2B1.6158.0-0.1 $0.0 \pm 0.0$ $0.7 \pm 1.1$ -20.0 \pm 8.4GA00694WC3B1.6346.3-0.2 $0.0 \pm 0.0$ $0.3 \pm 1.1$ -16.2 \pm 8.6GA00695WC4B22.9169.1-0.1 $0.0 \pm 0.0$ $0.9 \pm 1.3$ -18.3 \pm 8.4GA00696WD1A12.3191.3-0.2 $-0.1 \pm 0.0$ $0.2 \pm 1.2$ -12.3 \pm 8.9GA00697WD2A-9.1169.1-0.2 $0.0 \pm 0.0$ $-0.4 \pm 0.7$ -16.6 \pm 8.5GA00698WD3A-9.1324.2-0.2 $0.0 \pm 0.0$ $0.5 \pm 1.2$ -18.3 \pm 8.4GA00699                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | WB4B       | -9.1        | 158.0       | -0.7      | 0.0 ± 0.0                 | $-0.5 \pm 0.8$       | -22.7 ± 8.4      | GA00687 |
| WC1A1.6191.3 $-0.3$ $0.2 \pm 0.4$ $-0.2 \pm 1.1$ $-15.7 \pm 8.6$ GA00689WC2A1.6102.6 $-0.1$ $0.0 \pm 0.0$ $0.7 \pm 1.1$ $-15.7 \pm 8.6$ GA00690WC3A $-9.1$ $80.5$ $-0.1$ $0.0 \pm 0.0$ $0.7 \pm 1.1$ $-18.3 \pm 8.4$ GA00690WC4A1.6434.9 $-0.1$ $0.0 \pm 0.0$ $-0.1 \pm 1.0$ $-12.8 \pm 8.9$ GA00691WC4A1.6434.9 $-0.1$ $0.0 \pm 0.0$ $0.1 \pm 1.0$ $-17.8 \pm 8.6$ GA00692WC1B $-9.1$ 279.9 $-0.1$ $0.2 \pm 0.4$ $-0.4 \pm 1.0$ $-25.8 \pm 10.1$ GA00693WC2B1.6158.0 $-0.1$ $0.0 \pm 0.0$ $0.7 \pm 1.1$ $-20.0 \pm 8.4$ GA00694WC3B1.6346.3 $-0.2$ $0.0 \pm 0.0$ $0.3 \pm 1.1$ $-16.2 \pm 8.6$ GA00695WC4B22.9169.1 $-0.1$ $0.0 \pm 0.0$ $0.9 \pm 1.3$ $-18.3 \pm 8.4$ GA00696WD1A12.3191.3 $-0.2$ $-0.1 \pm 0.0$ $0.2 \pm 1.2$ $-12.3 \pm 8.9$ GA00697WD2A $-9.1$ 169.1 $-0.2$ $0.0 \pm 0.0$ $-0.4 \pm 0.7$ $-16.6 \pm 8.5$ GA00698WD3A $-9.1$ $324.2$ $-0.2$ $0.0 \pm 0.0$ $0.5 \pm 1.2$ $-18.3 \pm 8.4$ GA00699                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | WB5B       | -9.1        | -74.6       | -0.7      | $0.0 \pm 0.0$             | 0.1 ± 1.0            | -145 + 87        | GA00688 |
| WC2A       1.6       102.6       -0.1 $0.0 \pm 0.0$ $0.7 \pm 1.1$ $-18.3 \pm 8.4$ GA00690         WC3A       -9.1 $80.5$ -0.1 $0.0 \pm 0.0$ $0.7 \pm 1.1$ $-18.3 \pm 8.4$ GA00690         WC3A       -9.1 $80.5$ -0.1 $0.0 \pm 0.0$ $-0.1 \pm 1.0$ $-12.8 \pm 8.9$ GA00691         WC4A       1.6 $434.9$ $-0.1$ $0.0 \pm 0.0$ $0.1 \pm 1.0$ $-17.8 \pm 8.6$ GA00692         WC1B       -9.1       279.9 $-0.1$ $0.2 \pm 0.4$ $-0.4 \pm 1.0$ $-25.8 \pm 10.1$ GA00693         WC2B       1.6       158.0 $-0.1$ $0.0 \pm 0.0$ $0.7 \pm 1.1$ $-20.0 \pm 8.4$ GA00694         WC3B       1.6       346.3 $-0.2$ $0.0 \pm 0.0$ $0.3 \pm 1.1$ $-16.2 \pm 8.6$ GA00695         WC4B       22.9       169.1 $-0.1$ $0.0 \pm 0.0$ $0.9 \pm 1.3$ $-18.3 \pm 8.4$ GA00696         WD1A       12.3       191.3 $-0.2$ $-0.1 \pm 0.0$ $0.2 \pm 1.2$ $-12.3 \pm 8.9$ GA00697         WD2A       -9.1       169.1 $-0.2$ $0.0 \pm 0.0$ $-0.4 \pm 0.7$ $-16.6$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | WC1A       | 1.6         | 191.3       | -0.3      | 0.2 ± 0.4                 | $-0.2 \pm 1.0$       | -157+ 86         | GA00689 |
| WC3A-9.1 $80.5$ -0.1 $0.0 \pm 0.0$ -0.1 $\pm 1.0$ -12.8 $\pm 8.9$ GA00691WC4A1.6434.9-0.1 $0.0 \pm 0.0$ $0.1 \pm 1.0$ -17.8 $\pm 8.6$ GA00692WC1B-9.1279.9-0.1 $0.2 \pm 0.4$ -0.4 $\pm 1.0$ -25.8 $\pm 10.1$ GA00693WC2B1.6158.0-0.1 $0.0 \pm 0.0$ $0.7 \pm 1.1$ -20.0 $\pm 8.4$ GA00694WC3B1.6346.3-0.2 $0.0 \pm 0.0$ $0.3 \pm 1.1$ -16.2 $\pm 8.6$ GA00695WC4B22.9169.1-0.1 $0.0 \pm 0.0$ $0.9 \pm 1.3$ -18.3 $\pm 8.4$ GA00696WD1A12.3191.3-0.2-0.1 $\pm 0.0$ $0.2 \pm 1.2$ -12.3 $\pm 8.9$ GA00697WD2A-9.1169.1-0.2 $0.0 \pm 0.0$ $-0.4 \pm 0.7$ -16.6 $\pm 8.5$ GA00698WD3A-9.1324.2-0.2 $0.0 \pm 0.0$ $0.5 \pm 1.2$ -18.3 $\pm 8.4$ GA00699                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | WC2A       | 1.6         | 102.6       | -0.1      | $0.0 \pm 0.0$             | 0.7 ± 1.1            | $-18.3 \pm 8.4$  | GA00690 |
| WC4A       1.6       434.9 $-0.1$ $0.0 \pm 0.0$ $0.1 \pm 1.0$ $-17.8 \pm 8.6$ GA00692         WC1B $-9.1$ 279.9 $-0.1$ $0.2 \pm 0.4$ $-0.4 \pm 1.0$ $-25.8 \pm 10.1$ GA00693         WC2B       1.6       158.0 $-0.1$ $0.0 \pm 0.0$ $0.7 \pm 1.1$ $-20.0 \pm 8.4$ GA00694         WC3B       1.6       346.3 $-0.2$ $0.0 \pm 0.0$ $0.3 \pm 1.1$ $-16.2 \pm 8.6$ GA00695         WC4B       22.9       169.1 $-0.1$ $0.0 \pm 0.0$ $0.9 \pm 1.3$ $-18.3 \pm 8.4$ GA00696         WD1A       12.3       191.3 $-0.2$ $-0.1 \pm 0.0$ $0.2 \pm 1.2$ $-12.3 \pm 8.9$ GA00697         WD2A $-9.1$ 169.1 $-0.2$ $0.0 \pm 0.0$ $-0.4 \pm 0.7$ $-16.6 \pm 8.5$ GA00698         WD3A $-9.1$ 324.2 $-0.2$ $0.0 \pm 0.0$ $0.5 \pm 1.2$ $-18.3 \pm 8.4$ GA00699                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | WC3A       | -9.1        | 80.5        | -0.1      | $0.0 \pm 0.0$             | -0.1 ± 1.0           | -12.8 ± 8.9      | GA00691 |
| WC1B       -9.1       279.9       -0.1 $0.2 \pm 0.4$ -0.4 \pm 1.0       -25.8 \pm 10.1       GA00693         WC2B       1.6       158.0       -0.1 $0.0 \pm 0.0$ $0.7 \pm 1.1$ -20.0 \pm 8.4       GA00694         WC3B       1.6       346.3       -0.2 $0.0 \pm 0.0$ $0.3 \pm 1.1$ -16.2 \pm 8.6       GA00695         WC4B       22.9       169.1       -0.1 $0.0 \pm 0.0$ $0.9 \pm 1.3$ -18.3 \pm 8.4       GA00696         WD1A       12.3       191.3       -0.2       -0.1 \pm 0.0 $0.2 \pm 1.2$ -12.3 \pm 8.9       GA00697         WD2A       -9.1       169.1       -0.2 $0.0 \pm 0.0$ $0.5 \pm 1.2$ -18.3 \pm 8.4       GA00698         WD3A       -9.1       324.2       -0.2 $0.0 \pm 0.0$ $0.5 \pm 1.2$ -18.3 \pm 8.4       GA006999                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | WC4A       | 1.6         | 434.9       | -0.1      | 0.0± 0.0                  | 01+ 10               | -178+ 86         | GA00692 |
| WC2B       1.6       158.0 $-0.1$ $0.0 \pm 0.0$ $0.7 \pm 1.3$ $10.0 \pm 10.1$ $0.00000$ WC2B       1.6       346.3 $-0.2$ $0.0 \pm 0.0$ $0.7 \pm 1.1$ $-20.0 \pm 8.4$ GA00694         WC3B       1.6       346.3 $-0.2$ $0.0 \pm 0.0$ $0.3 \pm 1.1$ $-16.2 \pm 8.6$ GA00695         WC4B       22.9       169.1 $-0.1$ $0.0 \pm 0.0$ $0.9 \pm 1.3$ $-18.3 \pm 8.4$ GA00696         WD1A       12.3       191.3 $-0.2$ $-0.1 \pm 0.0$ $0.2 \pm 1.2$ $-12.3 \pm 8.9$ GA00697         WD2A $-9.1$ 169.1 $-0.2$ $0.0 \pm 0.0$ $-0.4 \pm 0.7$ $-16.6 \pm 8.5$ GA00698         WD3A $-9.1$ $324.2$ $-0.2$ $0.0 \pm 0.0$ $0.5 \pm 1.2$ $-18.3 \pm 8.4$ GA006999                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | WC1B       | -9.1        | 279.9       | -0.1      | 0.2 ± 0.4                 | -0.4 ± 10            | -25.8 ± 10.1     | GA00693 |
| WC3B       1.6       346.3       -0.2 $0.0 \pm 0.0$ $0.3 \pm 1.1$ -16.2 \pm 8.6       GA00695         WC4B       22.9       169.1       -0.1 $0.0 \pm 0.0$ $0.9 \pm 1.3$ -18.3 \pm 8.4       GA00696         WD1A       12.3       191.3       -0.2       -0.1 \pm 0.0 $0.2 \pm 1.2$ -12.3 \pm 8.9       GA00697         WD2A       -9.1       169.1       -0.2 $0.0 \pm 0.0$ -0.4 \pm 0.7       -16.6 \pm 8.5       GA00698         WD3A       -9.1       324.2       -0.2 $0.0 \pm 0.0$ $0.5 \pm 1.2$ -18.3 \pm 8.4       GA00699                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | WC2B       | 1.6         | 158.0       | -0.1      | 0.0 ± 0.0                 | 0.7 ± 1.0            | -20.0 + 8.4      | GA00694 |
| WC4B         22.9         169.1         -0.1         0.0 ±         0.0         0.9 ±         1.3         -18.3 ±         8.4         GA00696           WD1A         12.3         191.3         -0.2         -0.1 ±         0.0         0.2 ±         1.2         -12.3 ±         8.9         GA00697           WD2A         -9.1         169.1         -0.2         0.0 ±         0.0         -0.4 ±         0.7         -16.6 ±         8.5         GA00698           WD3A         -9.1         324.2         -0.2         0.0 ±         0.0         0.5 ±         1.2         -18.3 ±         8.4         GA00699                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | WC3B       | 16          | 346.3       | -0.2      | 0.0 + 0.0                 | 03+ 11               | -162+ 86         | GA00695 |
| WD1A         12.3         191.3         -0.2         -0.1 ±         0.0         0.2 ±         1.3         -16.5 ±         6.4         GA00697           WD1A         12.3         191.3         -0.2         -0.1 ±         0.0         0.2 ±         1.2         -12.3 ±         8.9         GA00697           WD2A         -9.1         169.1         -0.2         0.0 ±         0.0         -0.4 ±         0.7         -16.6 ±         8.5         GA00698           WD3A         -9.1         324.2         -0.2         0.0 ±         0.0         0.5 ±         1.2         -18.3 ±         8.4         GA00699                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | WCAR       | 22.0        | 169.0       | _0.1      | 0.0 + 0.0                 | 0.0 + 1.1            | -183+ 94         | GANNEGE |
| WD2A         -9.1         169.1         -0.2         0.0 $\pm$ 0.0         -0.4 $\pm$ 0.7         -16.6 $\pm$ 8.5         GA00698           WD3A         -9.1         324.2         -0.2         0.0 $\pm$ 0.0         -0.5 $\pm$ 1.2         -18.3 $\pm$ 8.4         GA00699                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |            | 123         | 191.3       |           | -0.1 + 0.0                | 0.0 ± 1.0            | -123+ 90         | GA00697 |
| WD3A $-91$ 324.2 $-0.2$ $0.0 \pm 0.0$ $0.5 \pm 1.2$ $-18.3 \pm 8.4$ GA00699                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |            |             | 169.1       | _0.2      |                           | -0.4 + 0.7           | -166+ 95         | GANNERS |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | WD3A       |             | 324.2       | -0.2      | 0.0 + 0.0                 | 0.7 1 0.7            | -18 2 + 9 4      | GANNEGO |

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| Fort Meade, Building 2802 (Room 3) |             |             |       |            |                     |              |         |  |
|------------------------------------|-------------|-------------|-------|------------|---------------------|--------------|---------|--|
| Location                           |             | Monitoring  |       |            |                     |              |         |  |
| Code                               | Alpha       | Beta        | Gamma | Alpha      | Beta                | LS           | Wipe    |  |
| (Units =>)                         | dpm/100cm^2 | dpm/100cm^2 | uR/hr | dpi        | m/100cm^2 +/- 2 sig | ma           | Number  |  |
| (Bkgd =>)                          | 1.7         | 149.47      | 5.00  | 0.0        | 1.0                 | 30.6         | 1       |  |
| (MDA =>)                           | 54          | 401         | -     | 0.6        | 1.0                 | 26.5         |         |  |
| WD4A                               | -9.1        | 202.3       | -0.4  | 0.0 ± 0.0  | 1.1 ± 1.3           | -19.6 ± 8.5  | GA00700 |  |
| WD5A                               | -9.1        | 169.1       | -0.1  | 0.4 ± 0.6  | -1.4 ± 0.5          | -17.0 ± 8.5  | GA00701 |  |
| WD1B                               | 1.6         | 191.3       | -0.4  | 0.0 ± 0.0  | -0.6 ± 0.6          | -15.3 ± 8.7  | GA00702 |  |
| WD2B                               | 12.3        | 279.9       | -0.4  | 0.0 ± 0.0  | -0.3 ± 0.9          | -12.8 ± 8.9  | GA00703 |  |
| WD3B                               | 1.6         | 3.0         | -0.5  | 0.0 ± 0.0  | -0.7 ± 0.6          | -11.5 ± 9.0  | GA00704 |  |
| WD4B                               | -9.1        | 69.4        | -0.8  | -0.1 ± 0.0 | -0.8 ± 0.8          | -15.3 ± 9.6  | GA00705 |  |
| WD5B                               | -9.1        | 291.0       | -0.9  | 0.0 ± 0.0  | ,0.5 ± 1.1          | -18.3 ± 8.6  | GA00706 |  |
| QA                                 | N/A         | N/A         | N/A   | 0.0 ± 0.0  | -0.3 ± 0.9          | -17.0 ± 8.5  | GA00707 |  |
| RSINK1                             | 1.6         | 47.3        | -1.3  | 0.2 ± 0.4  | 0.7 ± 1.2           | -14.5 ± 9.4  | GA00708 |  |
| RCAB2                              | 1.6         | 224.5       | -1.3  | 0.2 ± 0.4  | -0.2 ± 1.1          | -28.1 ± 12.2 | GA00709 |  |
| RCAB3                              | -9.1        | 36.2        | -1.1  | 0.0 ± 0.0  | 0.9 ± 1.2           | -26.7 ± 10.7 | GA00710 |  |
| RCAB4                              | -9.1        | 124.8       | -1.1  | 0.0 ± 0.0  | -0.5 ± 0.8          | -20.5 ± 9.7  | GA00711 |  |
| RCAB5                              | 1.6         | 257.7       | -0.9  | 0.0 ± 0.0  | 1.1 ± 1.3           | -19.1 ± 9.0  | GA00712 |  |
| RCAB6                              | -9.1        | 158.0       | -1.0  | 0.2 ± 0.4  | -0.2 ± 1.1          | -20.0 ± 8.4  | GA00713 |  |
| RCAB7                              | -9.1        | 357.4       | -1.1  | 0.0 ± 0.0  | -0.8 ± 0.4          | -15.1 ± 9.1  | GA00714 |  |
| RD8                                | 12.3        | 124.8       | -1.6  | 0.0 ± 0.0  | -0.3 ± 0.9          | -15.0 ± 9.4  | GA00715 |  |
| RCAB9                              | 1.6         | 213.4       | -1.3  | 0.0 ± 0.0  | 0.1 ± 1.0           | -16.8 ± 9.2  | GA00716 |  |
| RVENT                              | -9.1        | 257.7       | -0.7  | 0.2 ± 0.4  | 0.2 ± 1.2           | -15.0 ± 10.5 | GA00717 |  |
| RPIPE                              | 1.6         | 113.7       | -0.6  | 0.4 ± 0.6  | 0.3 ± 1.0           | -19.1 ± 9.3  | GA00718 |  |

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|            | Fort Meade, Building 2802 (Room 4) |             |       |            |                     |              |         |  |  |  |
|------------|------------------------------------|-------------|-------|------------|---------------------|--------------|---------|--|--|--|
| Location   |                                    | Monitoring  |       |            | ·                   |              |         |  |  |  |
| Code       | Aipha                              | Beta        | Gamma | Alpha      | Beta                | LS           | Wipe    |  |  |  |
| (Units =>) | dpm/100cm^2                        | dpm/100cm^2 | uR/hr | dp         | m/100cm^2 +/- 2 sig | ma           | Number  |  |  |  |
| (Bkgd =>)  | 1.7                                | 149.47      | 5.00  | 0.0        | 1.0                 | 30.0         | ]       |  |  |  |
| (MDA =>)   | 54                                 | 401         | -     | 0.6        | 1.0                 | 27.8         |         |  |  |  |
| WD4A       | -9.1                               | 25.1        | -0.5  | 0.2 ± 0.4  | -0.8 ± 0.8          | -28.2 ± 8.8  | GA00769 |  |  |  |
| WD5A       | 12.3                               | 91.6        | -0.6  | 0.0 ± 0.0  | 0.3.± 1.0           | -20.9 ± 9.5  | GA00770 |  |  |  |
| WD1B       | 12.3                               | -74.6       | -0.5  | 0.0 ± 0.0  | -0.5 ± 0.8          | -22.6 ± 8.8  | GA00771 |  |  |  |
| WD2B       | -9.1                               | 25.1        | -0.7  | 0.0 ± 0.0  | -0.9 ± 0.4          | -20.8 ± 8.7  | GA00772 |  |  |  |
| WD3B       | -9.1                               | 25.1        | -0.6  | 0.2 ± 0.4  | -0.6± 0.9           | -27.0 ± 10.3 | GA00773 |  |  |  |
| WD4B       | 1.6                                | 36.2        | -0.5  | 0.2 ± 0.4  | 0.3 ± 1.0           | -35.9 ± 11.7 | GA00774 |  |  |  |
| WD5B       | -9.1                               | 69.4        | -0.7  | 0.0 ± 0.0  | 0.3 ± 1.1           | -19.1 ± 9.1  | GA00775 |  |  |  |
| RCNT1      | -9.1                               | 91.6        | -1.1  | 0.2 ± 0.4  | -0.9 ± 0.4          | -22.8 ± 9.8  | GA00776 |  |  |  |
| RCNT2      | 12.3                               | 169.1       | -1.3  | -0.1 ± 0.0 | -1.2 ± 0.6          | -22.3 ± 9.8  | GA00777 |  |  |  |
| RSNK3      | 12.3                               | 268.8       | -0.8  | 0.0 ± 0.0  | 0.1 ± 0.9           | -14.8 ± 9.7  | GA00778 |  |  |  |
| RD4        | 1.6                                | 202.3       | -1.0  | 0.0 ± 0.0  | -0.1 ± 1.0          | -24.8 ± 9.9  | GA00779 |  |  |  |
| RD5        | 1.6                                | 268.8       | -1.0  | 0.0 ± 0.0  | -0.1 ± 0.9          | -22.5 ± 10.7 | GA00780 |  |  |  |
| RD6        | 1.6                                | 235.6       | -1.1  | 0.2 ± 0.4  | -0.6 ± 0.9          | -27.1 ± 9.7  | GA00781 |  |  |  |
| RD7        | -9.1                               | -30.3       | -0.9  | 0.2 ± 0.4  | -0.4 ± 0.7          | -21.9 ± 10.1 | GA00782 |  |  |  |
| RD8        | -9.1                               | -30.3       | -0.9  | 0.0 ± 0.0  | -0.7 ± 0.7          | -25.6 ± 9.5  | GA00783 |  |  |  |

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| Fort Meade, Building 2802 (Room 4) |             |             |       |             |                     |              |         |
|------------------------------------|-------------|-------------|-------|-------------|---------------------|--------------|---------|
| Location                           |             | Monitoring  |       |             | Wipe Test           |              | T       |
| Code                               | Alpha       | Beta        | Gamma | Alpha       | Beta                | LS           | Wipe    |
| (Units =>)                         | dpm/100cm^2 | dpm/100cm^2 | uR/hr | dp          | m/100cm^2 +/- 2 sig | ma           | Number  |
| (Bkgd =>)                          | 1.7         | 149.47      | 5.00  | 0.0         | 1.0                 | 30.0         | 1       |
| (MDA =>)                           | 54          | 401         | -     | 0.6         | 1.0                 | 27.8         | 1 1     |
| FA1                                | 1.6         | 146.9       | -0.9  | 0.0 ± 0.0   | 0.3 ± 1.1           | -21.9 ± 9.0  | GA00719 |
| FA2                                | 1.6         | 158.0       | -1.0  | 0.0 ± 0.0   | -0.3 ± 0.8          | -15.7 ± 8.9  | GA00720 |
| FA3                                | -9.1        | 91.6        | -1.2  | -0.1 ± 0.0  | -0.6 ± 0.9          | -22.7 ± .8.4 | GA00721 |
| FA4                                | -9.1        | 357.4       | -1.3  | 0.0 ± 0.0   | -0.6 ± 0.6          | -17.0 ± 8.7  | GA00722 |
| FB1                                | -9.1        | 224.5       | -1.2  | 0.0 ± 0.0   | 0.7 ± 1.3           | -18.2 ± 9.1  | GA00723 |
| FB2                                | -9.1        | 235.6       | -1.1  | 0.0 ± 0.0   | 0.1 ± 1.0           | -17.3 ± 8.9  | GA00724 |
| FB3                                | -9.1        | -52.4       | -1.1  | -0.1 ± 0.0  | -1.2 ± 0.6          | -17.2 ± 9.4  | GA00725 |
| FB4                                | -9.1        | 102.6       | -1.0  | 0.0 ± 0.0   | 0.1 ± 0.9           | -18.6 ± 10.0 | GA00726 |
| FC1                                | 1.6         | 146.9       | -0.9  | 0.2 ± 0.4   | -0.1 ± 1.0          | -26.2 ± 9.6  | GA00727 |
| FC2                                | 1.6         | 279.9       | -0.8  | 0.0 ± 0.0   | -0.1 ± 0.9          | -21.4 ± 9.5  | GA00728 |
| FC3                                | 1.6         | 401.7       | -0.7  | 0.2 ± 0.4   | -0.4 ± 1.0          | -21.8 ± 9.4  | GA00729 |
| FC4                                | -9.1        | 102.6       | -0.9  | 0.0 ± 0.0   | 0.3 ± 1.0           | -24.8 ± 8.6  | GA00730 |
| FD1                                | -9.1        | 191.3       | -0.8  | 0.0 ± 0.0   | 0.1 ± 1.1           | -20.9 ± 9.0  | GA00731 |
| FD2                                | -9.1        | 302.0       | -0.8  | 0.0 ± 0.0   | 0.7 ± 1.2           | -20.0 ± 9.6  | GA00732 |
| FD3                                | 1.6         | 257.7       | -0.7  | -0.1 ± 0.0  | -0.6 ± 0.9          | -21.3 ± 9.0  | GA00733 |
| FD4                                | 1.6         | 235.6       | -0.6  | 0.0 ± 0.0   | -0.2 ± 0.8          | -19.1 ± 9.4  | GA00734 |
| FE1                                | 1.6         | 135.9       | -0.4  | 0.0 ± 0.0   | -0.5 ± 0.8          | -19.5 ± 9.6  | GA00735 |
| FE2                                | -9.1        | 102.6       | -0.4  | 0.0 ± 0.0   | 0.3 ± 1.1           | -24.0 ± 9.0  | GA00736 |
| FE3                                | 1.6         | 335.3       | -0.3  | -0.1 ± 0.0  | -0.4 ± 1.0          | -25.9 ± 9.0  | GA00737 |
| FE4                                | -9.1        | 58.3        | -0.4  | 0.0 ± 0.0   | 0.1 ± 0.9           | -18.2 ± 9.8  | GA00738 |
| WA1A                               | 1.6         | -196.4      | -1.1  | 0.0 ± 0.0   | 0.1 ± 1.1           | -18.7 ± 9.5  | GA00739 |
| WA2A                               | -9.1        | -296.1      | -1.2  | 0.0 ± 0.0   | -0.5 ± 0.7          | -22.6 ± 10.8 | GA00740 |
| WA3A                               | 12.3        | -141.0      | -1.2  | -0.1 ± 0.0  | 0.4 ± 1.3           | -27.8 ± 11.4 | GA00741 |
| WA4A                               | 12.3        | -141.0      | -1.4  | 0.0 ± 0.0   | -0.2 ± 0.8          | -22.3 ± 9.4  | GA00742 |
| WA1B                               | -9.1        | 213.4       | -1.4  | 0.0 ± 0.0   | -0.7 ± 0.7          | -19.1 ± 8.9  | GA00743 |
| WA2B                               | 12.3        | -41.3       | -1.3  | 0.0 ± 0.0   | -0.1 ± 0.9          | -20.9 ± 8.8  | GA00744 |
| WA3B                               | 1.6         | 279.9       | -1.2  | -0.1 ± 0.0  | -0.8 ± 0.8          | -19.6 ± 8.9  | GA00745 |
| WA4B                               | 1.6         | -8.1        | -1.3  | 0.0 ± 0.0   | -0.4 ± 0.7          | -17.9 ± 9.1  | GA00746 |
| WB1A                               | -9.1        | 25.1        | -1.4  | 0.0 ± 0.0   | -0.3 ± 0.9          | -21.3 ± 8.7  | GA00747 |
| WB2A                               | -9.1        | 135.9       | -1.5  | 0.0 ± 0.0   | -0.3 ± 0.8          | -19.6 ± 8.9  | GA00748 |
| WB3A                               | -9.1        | 146.9       | -1.4  | -0.1 ± 0.0  | 0.6 ± 1.3           | -16.3 ± 9.0  | GA00749 |
| WB4A                               | -9.1        | 3.0         | -1.2  | 0.0 ± 0.0   | -0.2 ± 0.8          | -21.7 ± 8.7  | GA00750 |
| QA                                 | N/A         | N/A         | N/A   | 0.2 ± 0.4   | -0,5 ± 0.8          | -21.7 ± 8.9  | GA00751 |
| WB5A                               | -9.1        | 257.7       | -0.8  | 0.0 ± 0.0   | -0.3 ± 0.8          | -22.6 ± 8.6  | GA00752 |
| WB1B                               | /12.3       | 191.3       | -1.0  | -0.1 ± 0.0  | 0.2 ± 1.2           | -20.9 ± 8.8  | GA00753 |
| WB2B                               | -9.1        | 291.0       | -1.0  | 0.0 ± 0.0   | -0.2 ± 0.8          | -17.4 ± 9.1  | GA00754 |
| WB3B                               | -9.1        | -74.6       | -1.0  | 0.0 ± 0.0   | -0.5 ± 0.8          | -19.6 ± 8.7  | GA00755 |
| WB4B                               | -9.1        | 257.7       | -0.9  | 0.0 ± 0.0   | -0.1 ± 0.9          | -20.9 ± 8.8  | GA00756 |
| WB5B                               | 1.6         | 146.9       | -0.9  | -0.1 ± 0.0  | -0.4 ± 1.0          | -20.0 ± 8.9  | GA00757 |
| WC1A                               | 22.9        | 357.4       | -0.7  | 0.0 ± 0.0   | -0.2 ± 0.8          | -17.9 ± 9.1  | GA00758 |
| WC2A                               | 1.6         | 468.2       | -0.8  | 0.0 ± 0.0   | -0.1 ± 1.0          | -23.5 ± 8.8  | GA00759 |
| WC3A                               | 1.6         | 169.1       | -0.4  | 0.0 ± 0.0   | 0.1 ± 1.0           | -14.5 ± 9.4  | GA00760 |
| WC4A                               | 1.6         | 202.3       | -0.5  | 0.2 ± 0.4   | -0.6 ± 0.9          | -16.6 ± 9.2  | GA00761 |
| WC1B                               | 12.3        | 180.2       | -0.6  | 0.2 ± 0.4   | 0.9 ± 1.2           | -17.9 ± 9.1  | GA00762 |
| WC2B                               | -9.1        | 14.0        | -0.7  | 0.0 ± 0.0   | 0.1 ± 1.1           | -19.6 ± 9.1  | GA00763 |
| WC3B                               | -9.1        | -8.1        | -0.6  | ′ 0.2 ± 0.4 | 0.3 ± 1.1           | -35.6 ± 12.4 | GA00764 |
| WC4B                               | -9.1        | 324.2       | -0.5  | -0.1 ± 0.0  | -1.0 ± 0.7          | -20.0 ± 9.3  | GA00765 |
| WD1A                               | 1.6         | 47.3        | -0.5  | 0.0 ± 0.0   | -0.2 ± 0.8          | -19.6 ± 9.1  | GA00766 |
| WD2A                               | -9.1        | 80.5        | -0.4  | 0.0 ± 0.0   | -0.7 ± 0.7          | -16.2 ± 9.2  | GA00767 |
| WD3A                               | -9.1        | 113.7       | -0.3  | 0.0 ± 0.0   | 0.5 ± 1.1           | -21.7 ± 8.9  | GA00768 |

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11. see - 11. 460



|            |             | Fo          | rt Meade, | Building 2802 | (Room 5)            |                 |         |
|------------|-------------|-------------|-----------|---------------|---------------------|-----------------|---------|
| Location   |             | Monitoring  |           |               | Wipe Test           |                 |         |
| Code       | Alpha       | Beta        | Gamma     | Alpha         | Beta                | LS .            | Wipe    |
| (Units =>) | dpm/100cm^2 | dpm/100cm^2 | uR/hr     | dpi           | m/100cm^2 +/- 2 sig | ma              | Number  |
| (Bkgd =>)  | 1.7         | 149.47      | 5.00      | 0.0           | 0.8                 | 31.4            |         |
| (MDA =>)   | 54          | 401         | -         | 2.6           | 2.8                 | 28.2            | 1       |
| FA1        | 1.6         | 69.4        | -0.2      | 0.0 ± 0.0     | -0.1 ± 0.9          | -23.6 ± 9.4     | GA00784 |
| FA2        | 12.3        | 246.6       | -0.5      | -0.1 ± 0.0    | -0.4 ± 1.0          | -25.5 ± 9.3     | GA00785 |
| FA3        | 1.6         | 113.7       | -0.8      | 0.0 ± 0.0     | -0.2 ± 0.8          | -20.4 ± 9.5     | GA00786 |
| FA4        | 1.6         | -74.6       | -0.6      | 0.0 ± 0.0     | -0.5 ± 0.8          | -25.5 ± 9.3     | GA00787 |
| FA5        | 1.6         | -185.4      | -0.7      | 0.0 ± 0.0     | -0.3 ± 0.8          | -21.3 ± 9.4     | GA00788 |
| FB1        | -9.1        | 80.5        | -0.7      | -0.1 ± 0.0    | -0.4 ± 1.0          | -20.4 ± 9.5     | GA00789 |
| FB2        | -9.1        | -130.0      | -0.8      | 0.0 ± 0.0     | 0.1 ± 0.9           | -20.9 ± 9.9     | GA00790 |
| FB3        | -9.1        | -85.7       | -0.9      | 0.0 ± 0.0     | -0.7 ± 0.7          | -17.7 ± 10.2    | GA00791 |
| FB4        | -9.1        | -85.7       | -0.9      | 0.0 ± 0.0     | 0.7 ± 1.2           | -21.7 ± 9.1     | GA00792 |
| FB5        | 12.3        | 3.0         | -0.8      | -0.1 ± 0.0    | -0.4 ± 1.0          | -19.1 ± 9.1     | GA00793 |
| FC1        | -9.1        | -185.4      | -0.7      | 0.0 ± 0.0     | -0.2 ± 0.8          | -19.1 ± 9.1     | GA00794 |
| FC2        | 1.6         | -174.3      | -0.7      | 0.2 ± 0.4     | -0.7 ± 0.7          | -24.8 ± 8.8     | GA00795 |
| FC3        | 1.6         | -152.1      | -0.6      | 0.0 ± 0.0     | -0.7 ± 0.6          | -19.1 ± 9.3     | GA00796 |
| FC4        | 1.6         | -141.0      | -0.6      | 0.2 ± 0.4     | -0.2 ± 1.1          | -21.7 ± 8.9     | GA00797 |
| FC5        | 12.3        | 3.0         | -0.5      | 0.0 ± 0.0     | 0.5 ± 1.1           | -17.8 ± 9.4     | GA00798 |
| FD1        | -9.1        | -163.2      | -0.6      | 0.0 ± 0.0     | -0.5 ± 0.8          | -20.0 ± 9.3     | GA00799 |
| QA         | N/A         | N/A         | N/A       | 0.0 ± 0.0     | -0.3 ± 0.8          | -21.3 ± 8.9     | GA00800 |
| FD2        | -9.1        | -318.3      | -0.5      | 0.2 ± 0.4     | -0.4 ± 1.0          | -31.9 ± 9.2     | GA00801 |
| FD3        | -9.1        | -240.7      | -0.5      | 0.2 ± 0.4     | 0.1 ± 0.9           | -17.9 ± 9.2     | GA00802 |
| FD4        | 1.6         | -285.0      | -0.9      | $0.0 \pm 0.0$ | -0.5 ± 0.8          | $-25.0 \pm 9.3$ | GA00803 |
| FD5        | 1.6         | -406.9      | -0.6      | $0.0 \pm 0.0$ | -0.5 ± 0.7          | -22.6 ± 8.8     | GA00804 |
| FE1        | -9.1        | -362.6      | -0.1      | -0.1 ± 0.0    | -0.8 ± 0.8          | -21.4 ± 9.6     | GA00805 |
| FE2        | 12.3        | -440.1      | -0.1      | 0.0 ± 0.0     | 0.1 ± 0.9           | -23.9 ± 10.3    | GA00806 |
| FE3        | -9.1        | -107.8      | -0.2      | 0.0 ± 0.0     | -0.1 ± 1.0          | -20.5 ± 9.7     | GA00807 |
| FE4        | -9.1        | -240.7      | -0.4      | 0.0 ± 0.0     | -0.7 ± 0.6          | -23.2 ± 9.5     | GA00808 |
| FE5        | 12.3        | -52.4       | -0.2      | -0.1 ± 0.0    | 0.2 ± 1.2           | -31.2 ± 12.1    | GA00809 |
| FF1        | -9.1        | -74.6       | -0.3      | 0.0 ± 0.0     | -0.4 ± 0.7          | -21.3 ± 8.9     | GA00810 |
| FF2        | -9.1        | 3.0         | -0.3      | 0.0 ± 0.0     | -0.5 ± 0.8          | -27.1 ± 8.8     | GA00811 |
| FF3        | 1.6         | 124.8       | -0.3      | 0.0 ± 0.0     | 0.3 ± 1.1           | -23.9 ± 8.9     | GA00812 |
| FF4        | 1.6         | -63.5       | -0.2      | -0.1 ± 0.0    | -1.0 ± 0.7          | -25.0 ± 9.3     | GA00813 |
| FF5        | 12.3        | 113.7       | -0.3      | 0.0 ± 0.0     | -0.2 ± 0.8          | -23.0 ± 9.0     | GA00814 |
| WAIA       | 1.6         | -130.0      | -0.9      | 0.0 ± 0.0     | -0.5 ± 0.8          | -24.7 ± 8.6     | GA00815 |
| WA2A       | - 1.6       | -130.0      | -1.1      | 0.2 ± 0.4     | 0.1 ± 1.0           | -19.6 ± 9.5     | GA00816 |
| WA3A       | 1.6         | -52.4       | -1.1      | -0.1 ± 0.0    | -0.6 ± 0.9          | -22.2 ± 9.3     | GA00817 |
| WA4A       | 1.6         | -141.0      | -1.1      | 0.0 ± 0.0     | -0.6 ± 0.6          | -16.2 ± 9.4     | GA00818 |
| WA1B       | -9.1        | 113.7       | -1.1      | 0.0 ± 0.0     | -0.7 ± 0.7          | -24.3 ± 8.6     | GA00819 |
| WA2B       | 1.6         | -130.0      | -1.0      | 0.0 ± 0.0     | 0.3 ± 1.1           | -27.0 ± 9.4     | GA00820 |
| WA3B       | 1.6         | -174.3      | -0.8      | 0.2 ± 0.4     | 0.2 ± 1.2           | -22.5 ± 8.6     | GA00821 |
| WA4B       | 1.6         | 268.8       | -1.1      | 0.0 ± 0.0     | 0.3 ± 1.0           | -22.1 ± 8.8     | GA00822 |
| WB1A       | 12.3        | 25.1        | -1.1      | 0.0 ± 0.0     | -0.1 ± 1.0          | -14.2 ± 9.3     | GA00823 |
| WB2A       | -9.1        | -274.0      | -1.2      | 0.0 ± 0.0     | -0.9 ± 0.4          | -24.7 ± 8.6     | GA00824 |
| WB3A       | 1.6         | -8.1        | -1.0      | -0.1 ± 0.0    | 0.2 ± 1.2           | -21.4 ± 9.6     | GA00825 |
| WB4A       | -9.1        | -63.5       | -0.9      | 0.0 ± 0.0     | -0.2 ± 0.8          | -23.6 ± 9.2     | GA00826 |
| WB1B       | 12.3        | -8.1        | -1.1      | 0.0 ± 0.0     | -0.9± 0.6           | -19.6 ± 9.3     | GA00827 |
| WB2B       | -9.1        | 36.2        | -1.1      | 0.0 ± 0.0     | -0.1 ± 0.9          | -21.3 ± 8.7     | GA00828 |
| WB3B       | -9.1        | 69.4        | -0.9      | -0.1 ± 0.0    | -0.4 ± 1.0          | -22.8 ± 9.8     | GA00829 |
| WB4B       | -9.1        | 102.6       | -1.0      | 0,0 ± 0.0     | 0.9 ± 1.2           | -20.4 ± 8.8     | GA00830 |
| WC1A       | 1.6         | 14.0        | -0.7      | 0.0 ± 0.0     | 0.3 ± 1.1           | -18.0 ± 8.8     | GA00831 |
| WC2A       | -9.1        | 91.6        | -0.6      | 0.2 ± 0.4     | -0.7 ± 0.6          | -21.2 ± 8.5     | GA00832 |
| WC3A       | -9.1        | 14.0        | -0.7      | -0.1 ± 0.0    | -0.6 ± 0.9          | -19.2 ± 8.7     | GA00833 |

C-9-1

| Fort Meade, Building 2802 (Room 5) |             |             |       |                |                     |              |         |  |  |
|------------------------------------|-------------|-------------|-------|----------------|---------------------|--------------|---------|--|--|
| Location                           |             | Monitoring  |       |                | Wipe Test           |              |         |  |  |
| Code                               | Alpha       | Beta        | Gamma | Alpha          | Beta                | LS           | Wipe    |  |  |
| (Units =>)                         | dpm/100cm^2 | dpm/100cm^2 | uR/hr | dp             | m/100cm^2 +/- 2 sig | ma           | Number  |  |  |
| (Bkgd =>)                          | 1.7         | 149.47      | 5.00  | 0.0            | 0.8                 | 31.4         | ·       |  |  |
| (MDA =>)                           | 54          | 401         | -     | 2.6            | 2.8                 | 28.2         | 1 .     |  |  |
| WC4A                               | 12.3        | -30.3       | -0.6  | 0.0 ± 0.0      | -0.6 ± 0.6          | € -22.9± 8.3 | GA00834 |  |  |
| WC1B                               | 12.3        | 102.6       | -0.6  | 0.0 ± 0.0      | -0.3 ± 0.9          | -20.8 ± 8.7  | GA00835 |  |  |
| WC2B                               | -9.1        | 113.7       | -1.0  | 0.0 ± 0.0      | -0.7 ± 0.6          | -21.3 ± 8.7  | GA00836 |  |  |
| WC3B                               | 1.6         | 202.3       | -0.8  | 0.2 ± 0.4      | -0.2 ± 1.1          | -21.7 ± 8.2  | GA00837 |  |  |
| WC4B                               | 12.3        | -19.2       | -1.1  | 0.0 ± 0.0      | -0.4 ± 0.7          | -17.9 ± 8.6  | GA00838 |  |  |
| WD1A                               | 1.6         | -52.4       | -1.2  | 0.0 ± 0.0      | -0.1 ± 1.0          | -19.2 ± 8.5  | GA00839 |  |  |
| WD1B                               | 12.3        | -85.7       | -1.0  | 0.0 ± 0.0      | -0.5 ± 0.7          | -20.4 ± 9.1  | GA00840 |  |  |
| WE1A                               | -9.1        | -30.3       | -1.1  | -0.1 ± 0.0     | -0.8 ± 0.8          | -19.2 ± 8.5  | GA00841 |  |  |
| WE2A                               | 1.6         | -96.7       | -1.0  | 0.0 ± 0.0      | -0.2 ± 0.8          | -18.0 ± 8.4  | GA00842 |  |  |
| WE3A                               | -9.1        | 146.9       | -1.0  | 0.0 ± 0.0      | -0.3 ± 0.9          | -18.4 ± 8.4  | GA00843 |  |  |
| WE4A                               | 1.6         | -96.7       | -1.0  | 0.0 ± 0.0      | -0.1 ± 0.9          | -19.2 ± 8.5  | GA00844 |  |  |
| WE5A                               | -9.1        | -30.3       | -0.6  | $-0.1 \pm 0.0$ | $0.8 \pm 1.4$       | -15.4 ± 8.8  | GA00845 |  |  |
| WE6A                               | -9.1        | -218.6      | -0.7  | $0.0 \pm 0.0$  | 0.1 ± 0.9           | -15.0 + 8.9  | GA00846 |  |  |
| WE1B                               | 1.6         | 3.0         | -0.8  | 0.0 ± 0.0      | -0.1 ± 1.0          | -18.3 + 8.6  | GA00847 |  |  |
| WE2B                               | 12.3        | 135.9       | -0.9  | $0.0 \pm 0.0$  | -0.1 ± 0.9          | -16.3 + 8.5  | GA00848 |  |  |
| WE3B                               | -9.1        | 69.4        | -1.0  | -01+ 00        | -04+ 10             | -17.1 + 8.5  | GA00849 |  |  |
| OA .                               | N/A         | N/A         | N/A   | 00+ 00         | -04+ 07             | -117+ 92     | GA00850 |  |  |
| WE4B                               | 12.3        | 257.7       | -1.0  | $0.0 \pm 0.0$  | -0.3 ± 0.9          | -179+ 86     | GA00851 |  |  |
| WE5B                               | 1.6         | 135.9       | -0.7  | $0.0 \pm 0.0$  | -0.3 ± 0.8          | -17.4 + 8.9  | GA00852 |  |  |
| WE6B                               | 12.3        | -96.7       | -0.6  | -01+ 00        | -0.4 + 1.0          | -217+ 82     | GA00853 |  |  |
| WE1A                               | -91         | 80.5        | -0.5  | 0.0+ 0.0       | -0.2 + 0.8          | -20.4 + 8.4  | GA00854 |  |  |
| WF2A                               | 1.6         | -85.7       | -0.6  | $0.0 \pm 0.0$  | 0.5 + 1.2           | -18.8 + 8.5  | GA00855 |  |  |
| WE3A                               | 1.6         | 324.2       | -0.6  | 0.0 ± 0.0      | -0.3 ± 0.8          | -163+ 85     | GA00856 |  |  |
| WF4A                               | 1.6         | 36.2        | -0.7  | -0.1 ± 0.0     | 00+ 11              | -184+ 84     | GA00857 |  |  |
| WF5A                               | -9.1        | -8.1        | -0.6  | $0.0 \pm 0.0$  | 0.3 ± 1.0           | -176+ 84     | GA00858 |  |  |
| WF1B                               | -9.1        | 102.6       | -0.7  | $0.0 \pm 0.0$  | -0.3 ± 0.9          | -213+ 83     | GA00859 |  |  |
| WE2B                               | -91         | 58.3        | -0.6  | 0.0 + 0.0      | -03+ 08             | -142+ 89     | GA00860 |  |  |
| WF3B                               | -9.1        | 91.6        | -0.7  | -01+ 00        | 0.6 + 1.3           | -10.6+ 9.5   | GA00861 |  |  |
| WF4B                               | -9.1        | -19.2       | -0.6  | 0.0 ± 0.0      | 03+ 10              | -167+ 85     | GA00862 |  |  |
| WF5B                               | -9.1        | 833.7       | -0.2  | $0.0 \pm 0.0$  | -0.7 ± 0.7          | -180+ 84     | GA00863 |  |  |
| WG1A                               | -9.1        | 191.3       | -0.5  | 0.0 ± 0.0      | $0.3 \pm 1.1$       | -192 + 85    | GA00864 |  |  |
| WG2A                               | -9.1        | -163.2      | -0.5  | -0.1 ± 0.0     | -0.4 ± 1.0          | -196+ 87     | GA00865 |  |  |
| WG3A                               | -9.1        | -41.3       | -0.8  | $0.0 \pm 0.0$  | -0.4 ± 0.7          | -174+ 89     | GA00866 |  |  |
| WG4A                               | -9.1        | -96.7       | -0.8  | $0.0 \pm 0.0$  | -0.5 ± 0.8          | -214+ 95     | GA00867 |  |  |
| WG5A                               | -9.1        | -118.9      | -1.0  | $0.0 \pm 0.0$  | $-0.7 \pm 0.6$      | -182+ 93     | GA00868 |  |  |
| WG6A                               | -9.1        | 146.9       | -1.4  | $-0.1 \pm 0.0$ | -0.2 ± 1.1          | -122+ 96     | GA00869 |  |  |
| WG1B                               | -9.1        | -130.0      | -1.1  | $0.2 \pm 0.4$  | 1.1 ± 1.3           | -158 ± 88    | GA00870 |  |  |
| WG2B                               | -9.1        | 213.4       | -0.9  | $0.7 \pm 1.3$  | $-1.9 \pm 2.4$      | -234 + 83    | GA00871 |  |  |
| WG3B                               | -91         | 69.4        | -0.7  | 37+ 36         | 28+ 35              | -28.6 + 10.6 | GA00872 |  |  |
| WG4B                               | 16          | 25.1        | -1.0  | -0.5 + 0.3     | -02+ 30             | -171+ 87     | GA00873 |  |  |
| WG5B                               | -9.1        | 102.6       | -0.9  | 1.5± 2.1       | 0.7 ± 2.8           | -27.3 + 12.4 | GA00874 |  |  |
| WG6B                               | 16          | 91.6        | -1.1  | 0.7 + 13       | -0.7 + 2.0          | -28 4 + 12 2 | GA00875 |  |  |
| RCNT1                              | 1.5         | 180.2       | -12   | 0.0+ 0.0       | -0.1 + 2.5          | -20.5 + 0.2  | GA00876 |  |  |
| RD2                                | 1.5         | 124.8       | -10   | -0.5 + 0.3     | -19+ 23             | -20.0 + 9.5  | GA00877 |  |  |
| RCNT3                              |             | 124.8       | -1 1  | 0.0+ 0.1       | -10+ 20             | -214+ 0.0    | GA00878 |  |  |
| RD4                                |             | 47.3        | -11   | 0.0 + 0.1      | -13+ 27             | -16.2 + 0.0  | GA00970 |  |  |
| RD5                                |             | 25.1        | -1 1  | 0.0 + 0.0      | -13+ 17             | -15.0+ 0.9   | GA00880 |  |  |
| RSNKE                              | 01          | 36.2        | -1.4  | 0.01 0.0       | -02+ 30             | -14.0 + 0.2  | GA00000 |  |  |
| RD7                                | 16          | 47.3        | -14   | 07+ 15         | -0.5 + 2.3          | -14.01 9.2   | GA00882 |  |  |
| BCNT8                              | 1.0         | 14.0        | -1.4  | 0.1 1.5        | -13+ 27             | -24.5 + 0.0  | GA00882 |  |  |
| In control                         | 1 1.0       | 1 17.5      | -1.0  | 1 0.0 I 0.1    | -1.5 - 2.7          | -24.JI 9.U   | 0700000 |  |  |

C-9-2

Termination Survey, Fort Meade, MD, 11 Aug 97-23 an 98

| Fort Meade, Building 2802 (Room 5) |             |             |       |           |            |               |         |  |  |  |  |
|------------------------------------|-------------|-------------|-------|-----------|------------|---------------|---------|--|--|--|--|
| Location                           | Monitoring  |             |       |           |            |               |         |  |  |  |  |
| Code                               | Alpha       | Beta        | Gamma | Alpha     | Beta       | LS            | Wipe    |  |  |  |  |
| (Units =>)                         | dpm/100cm^2 | dpm/100cm^2 | uR/hr | dp        | Number     |               |         |  |  |  |  |
| (Bkgd =>)                          | 1.7         | 149.47      | 5.00  | 0.0       | 0.8        | 31.4 .        |         |  |  |  |  |
| (MDA =>)                           | 54          | 401         | -     | 2.6       | 2.8        | 28.2          |         |  |  |  |  |
| RD9                                | 1.6         | -218.6      | -1.5  | 0.0 ± 0.0 | 2.2 ± 3.3  | ✓ -21.8 ± 9.3 | GA00884 |  |  |  |  |
| RCNT10                             | -9.1        | -440.1      | -1.6  | 0.3 ± 1.6 | -1.3 ± 2.5 | -17.4 ± 8.9   | GA00885 |  |  |  |  |
| RD11                               | -9.1        | 135.9       | -1.4  | 0.0 ± 0.1 | 0.1 ± 2.5  | -27.3 ± 8.7   | GA00886 |  |  |  |  |

C-9-3

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|            | -           | Fort Me     | ade, Buil | ding 2802 (Ladi | es' Restroom)       | ······································ |         |
|------------|-------------|-------------|-----------|-----------------|---------------------|----------------------------------------|---------|
| Location   | Į –         | Monitoring  |           |                 | Wipe Test           |                                        |         |
| Code       | Alpha       | Beta        | Gamma     | Alpha           | Beta                | LS                                     | Wipe    |
| (Units =>) | dpm/100cm^2 | dpm/100cm^2 | uR/hr     | dpi             | m/100cm^2 +/- 2 sig | ma                                     | Number  |
| (Bkgd =>)  | 1.7         | 149.47      | 5.00      | 0.0             | 2.4                 | 31.8                                   | 1       |
| (MDA =>)   | 54          | 401         | -         | 2.6             | 2.8                 | 24.4                                   | 1       |
| FA1        | -9.1        | 1764.1      | -1.0      | 0.0 ± 0.1       | 1.1 ± 3.5           | -21.7 ± 8.5                            | GA00887 |
| FA2        | -9.1        | 1697.7      | -1.1      | 0.0 ± 0.0       | 2.2 ± 3.3           | -23.8 ± 8.3                            | GA00888 |
| FA3        | 12.3        | 1498.3      | -0.9      | 0.3 ± 1.6       | 0.4 ± 3.2           | -17.5 ± 8.7                            | GA00889 |
| FB1        | . 22.9      | 1321.1      | -0.9      | 0.0 ± 0.1       | 0.7 ± 2.8           | -19.1 ± 8.8                            | GA00890 |
| FB2        | 12.3        | 1465.1      | -0.9      | 0.0 ± 0.1       | -3.0 ± 1.8          | -23.0 ± 8.4                            | GA00891 |
| FB3        | 12.3        | 1642.3      | -0.6      | 0.0 ± 0.0       | -0.7 ± 2.1          | -20.9 ± 8.6                            | GA00892 |
| WA1A       | 12.3        | -8.1        | -0.8      | -0.5 ± 0.3      | 0.4 ± 3.2           | -19.6 ± 8.7                            | GA00893 |
| WA2A       | -9.1        | 401.7       | -0.7      | 0.0 ± 0.1       | 1.8 ± 3.2           | -19.6 ± 8.7                            | GA00894 |
| WA3A       | -9.1        | -85.7       | -0.8      | 0.0 ± 0.1       | -1.9 ± 2.4          | -20.4 ± 8.7                            | GA00895 |
| WA1B       | -9.1        | 102.6       | -1.0      | 0.0 ± 0.0       | -0.7 ± 2.1          | -17.9 ± 8.7                            | GA00896 |
| WA2B       | -9.1        | 135.9       | -1.3      | 0.3 ± 1.6       | 0.9 ± 3.4           | -17.9 ± 8.9                            | GA00897 |
| WA3B       | 10.1        | 25.1        | -1.0      | 0.0 ± 0.1       | 0.7 ± 2.8           | -20.0 ± 8.7                            | GA00898 |
| WB1A       | 1.6         | -85.7       | -1.2      | 0.0 ± 0.1       | -0.1 ± 3.1          | -20.8 ± 8.4                            | GA00899 |
| QA         | Ň/A         | N/A         | N/A       | 0.0 ± 0.0       | -0.7 ± 2.1          | -22.9 ± 8.2                            | GA00900 |
| WB2A       | -9.1        | 246.6       | -0.6      | -0.5 ± 0.3      | -0.2 ± 3.0          | -22.1 ± 8.3                            | GA00901 |
| WB1B       | -9.1        | 58.3        | -0.8      | 0.0 ± 0.1       | 0.1 ± 2.5           | -17.5 ± 8.7                            | GA00902 |
| WB2B       | -9.1        | 102.6       | -0.9      | 0.0 ± 0.1       | -1.3 ± 2.7          | -31.1 ± 10.9                           | GA00903 |
| WC1A       | 1.6         | 113.7       | -1.1      | 0.0 ± 0.0       | -0.1 ± 2.4          | -20.0 ± 8.9                            | GA00904 |
| WC2A       | 1.6         | 1121.7      | -1.1      | 0.3 ± 1.6       | -0.8 ± 2.8          | -19.2 ± 8.6                            | GA00905 |
| WC3A       | 22.9        | 1132.8      | -1.2      | 0.0 ± 0.1       | 0.1 ± 2.5           | -15.0 ± 8.9                            | GA00906 |
| WC1B       | -9.1        | -30.3       | -1.0      | 0.0 ± 0.1       | -0.1 ± 3.1          | -19.2 ± 8.6                            | GA00907 |
| WC2B       | 1.6         | 135.9       | -1.1      | 0.0 ± 0.0       | 2.2 ± 3.3           | -19.6 ± 8.3                            | GA00908 |
| WC3B       | -9.1        | -30.3       | -1.2      | -0.5 ± 0.3      | 0.4 ± 3.2           | -17.0 ± 9.0                            | GA00909 |
| WD1A       | 12.3        | -52.4       | -1.2      | 0.0 ± 0.1       | 1.3 ± 3.0           | -16.7 ± 8.6                            | GA00910 |
| WD2A       | 22.9        | -85.7       | -1.0      | 0.0 ± 0.1       | -1.3 ± 2.7          | -19.2 ± 8.6                            | GA00911 |
| WD1B       | 25.2        | 3.0         | -1.0      | 0.0 ± 0.0       | -0.1 ± 2.4          | -20.9 ± 8.9                            | GA00912 |
| WD2B       | -9.1        | 169.1       | -1.2      | -0.5 ± 0.3      | -1.3 ± 2.5          | -18.8 ± 8.6                            | GA00913 |
| RSNK1      | 40.3        | 2871.8      | -1.4      | 0.0 ± 0.1       | 1.8 ± 3.2           | -20.0 ± 8.5                            | GA00914 |

# Termination Survey, ort Meade, MD, 11 Aug 97-23 n 98

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| Fort Meade, Building 2802 (Men's Restroom) |             |             |        |            |                     |              |         |
|--------------------------------------------|-------------|-------------|--------|------------|---------------------|--------------|---------|
| Location                                   |             | Monitoring  |        |            | Wipe Test           |              | ·       |
| Code                                       | Alpha       | Beta        | Gamma  | Alpha      | Beta                | LS           | Wipe    |
| (Units =>)                                 | dpm/100cm^2 | dpm/100cm^2 | uR/hr  | dpi        | m/100cm^2 +/- 2 sig | ma           | Number  |
| (Bkgd =>)                                  | 1.7         | 149.47      | 5.00   | 0.0        | 2.4                 | 25.3         |         |
| (MDA =>)                                   | 54          | 401         | -      | 2.6        | 2.8                 | 25.5         | ·       |
| FA1                                        | 12.3        | 1420.8      | -1.3   | 0.0 ± 0.1  | -3.0 ± 1.8          | ✓-23.9 ± 8.6 | GA00915 |
| FA2                                        | 1.6         | 1454.0      | -1.0   | 0.0 ± 0.0  | 1.7 ± 3.1           | -15.2 ± 9.4  | GA00916 |
| FA3                                        | 1.6         | 1620.1      | -0.9   | 0.3 ± 1.6  | -0.8 ± 2.8          | -18.7 ± 9.1  | GA00917 |
| FB1                                        | 22.9        | 1465.1      | -0.7   | 0.0 ± 0.1  | 1.8 ± 3.2           | -18.2 ± 9.6  | GA00918 |
| FB2                                        | 12.3        | 1321.1      | -0.6   | 0.0 ± 0.1  | -1.3 ± 2.7          | -22.4 ± 9.7  | GA00919 |
| FB3                                        | -9.1        | 1498.3      | -0.5   | 0.0 ± 0.0  | -0.7 ± 2.1          | -20.0 ± 8.9  | GA00920 |
| WA1A                                       | 1.6         | 1265.7      | -0.6   | -0.5 ± 0.3 | -1.3 ± 2.5          | -18.4 ± 8.4  | GA00921 |
| WA2A                                       | 22.9        | 1177.1      | -0.5   | 0.0 ± 0.1  | -1.0 ± 2.0          | -20.8 ± 8.4  | GA00922 |
| WA3A                                       | 12.3        | 102.6       | -0.3   | 0.0 ± 0.1  | -1.3 ± 2.7          | -18.7 ± 8.8  | GA00923 |
| WA1B                                       | -9.1        | -296.1      | · -0.5 | 0.0 ± 0.0  | 1.1 ± 2.9           | -17.9 ± 8.7  | GA00924 |
| WA2B                                       | 1.6         | 69.4        | -1.0   | -0.5 ± 0.3 | -1.9 ± 2.3          | -22.1 ± 8.5  | GA00925 |
| WA3B                                       | -9.1        | 69.4        | -1.0   | 0.0 ± 0.1  | -1.0 ± 2.0          | -17.4 ± 9.2  | GA00926 |
| WB1A                                       | -9.1        | 91.6        | -0.9   | 0.0 ± 0.1  | -1.3 ± 2.7          | -10.6 ± 8.3  | GA00927 |
| WB2A                                       | -9.1        | 58.3        | -0.7   | 0.0 ± 0.0  | 1.1 ± 2.9           | -16.3 ± 7.5  | GA00928 |
| WB1B                                       | -9.1        | -19.2       | -0.6   | 0.3 ± 1.6  | -0.8 ± 2.8          | -26.5 ± 11.5 | GA00929 |
| WB2B                                       | 1.6         | 36.2        | -0.9   | 0.0 ± 0.1  | -1.6 ± 1.7          | -11.3 ± 8.4  | GA00930 |
| WC1A                                       | -9.1        | -63.5       | -0.9   | 0.0 ± 0.1  | -1.9 ± 2.4          | -13.2 ± 8.0  | GA00931 |
| WC2A                                       | -9.1        | 47.3        | -0.8   | 0.0 ± 0.0  | 1.7 ± 3.1           | -10.0 ± 8.2  | GA00932 |
| WC3A                                       | -9.1        | 235.6       | -0.8   | -0.5 ± 0.3 | -0.8 ± 2.8          | -11.7 ± 8.0  | GA00933 |
| WC1B                                       | 12.3        | 80.5        | -0.9   | 0.0 ± 0.1  | 1.8 ± 3.2           | -18.2 ± 8.2  | GA00934 |
| WC2B                                       | -9.1        | 213.4       | -1.2   | 0.0 ± 0.1  | -1.3 ± 2.7          | -13.3 ± 7.8  | GA00935 |
| WC3B                                       | -9.1        | 279.9       | -1.2   | 0.0 ± 0.0  | -0.7 ± 2.1          | -10.0 ± 8.2  | GA00936 |
| WD1A                                       | -9.1        | 124.8       | -1.2   | -0.5 ± 0.3 | 0.4 ± 3.2           | -7.1 ± 8.4   | GA00937 |
| WD2A                                       | -9.1        | 158.0       | -0.9   | 0.0 ± 0.1  | -1.0 ± 2.0          | -13.3 ± 7.8  | GA00938 |
| WD1B                                       | 1.6         | 3.0         | -1.0   | 0.0 ± 0.1  | -0.1 ± 3.1          | -12.9 ± 7.9  | GA00939 |
| WD2B                                       | -9.1        | 14.0        | -1.1   | 0.0 ± 0.0  | 0.5 ± 2.6           | -11.7 ± 8.0  | GA00940 |
| RSNK1                                      | 1.6         | 2772.1      | -1.2   | -0.5 ± 0.3 | -0.8 ± 2.8          | -9.6 ± 8.2   | GA00941 |

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| Fort Meade, Building 2805 (Hallway) |             |               |        |               |                     |              |          |
|-------------------------------------|-------------|---------------|--------|---------------|---------------------|--------------|----------|
| Location                            |             | Monitoring    |        |               | Wipe Test           |              | 1        |
| Code                                | Alpha       | Beta          | Gamma  | Alpha         | Beta                | LS           | Wipe     |
| (Units =>)                          | dpm/100cm^2 | dpm/100cm^2   | uR/hr  | dpi           | m/100cm^2 +/- 2 sig | ma           | Number   |
| (Bkgd =>)                           | 1.7         | 149.47        | 5.00   | 0.0           | 2.0                 | 29.0         | 1        |
| (MDA =>)                            | 54          | 401           | -      | 2.1           | 2.4                 | 60.1         | 1        |
| FA5                                 | -9.1        | 146.9         | -1.3   | 0.0 ± 0.0     | 0.7 ± 2.7           | 3.1 ± 14.9   | GA01489  |
| FA12                                | -9.1        | 213.4         | -1.3   | 0.0 ± 0.0     | -1.5 ± 1.6          | -10.8 ± 11.7 | GA01490  |
| FA13                                | 10.1        | 191.3         | -1.1   | 0.0 ± 0.0     | 0.7 ± 2.7           | -12.9 ± 12.6 | GA01491  |
| FB5                                 | 5.0         | 302.0         | -1.3   | 0.0 ± 0.0     | -1.5 ± 1.6          | 40.8 ± 21.8  | GA01492  |
| FB12                                | -9.1        | 14.0          | -1.2   | 0.0 ± 0.0     | 0.7 ± 2.7           | -14.5 ± 12.9 | GA01493  |
| FB13                                | -9.1        | 202.3         | -1.1   | 0.0 ± 0.0     | 2.3 ± 3.3           | -20.5 ± 10.5 | GA01494  |
| FC1                                 | -9.1        | 124.8         | -1.2   | 0.0 ± 0.0     | 1.2 ± 2.9           | 60.0 ± 27.9  | GA01495  |
| FC2                                 | -9.1        | -30.3         | -1.0   | 0.0 ± 0.0     | 1.8 ± 3.1           | 4.1 ± 16.4   | GA01496  |
| FC3                                 | -9.1        | 324.2         | -1.0   | 0.0 ± 0.0     | 1.8 ± 3.1           | 34.8 ± 23.0  | GA01497  |
| FC4                                 | 12.3        | 169.1         | -0.8   | 1.6 ± 2.2     | 1.2 ± 2.9           | -3.2 ± 14.8  | GA01498  |
| FC5                                 | -9.1        | 180.2         | -0.6   | $0.0 \pm 0.0$ | 0.7 ± 2.7           | 41.0 ± 26.5  | GA01499  |
|                                     | N/A         | N/A           | N/A    | $0.0 \pm 0.0$ | $-0.4 \pm 2.2$      | -16.2 ± 8.5  | GA01500  |
| FC6                                 | -9.1        | 135.9         | -0.9   | $0.0 \pm 0.0$ | 1.8± 3.1            | 31.9 + 19.7  | GA01501  |
| FC7                                 | 12.3        | 124.8         | -0.9   | 0.0 + 0.0     | 23+ 33              | -20.0 + 11.6 | GA01502  |
| FC8                                 | _91         | 146.9         | -0.7   | 0.01 0.0      | 01+ 25              | -132+ 112    | GA01503  |
| FC9                                 | -9.1        | 224.5         | -0.9   | 0.0 + 0.0     | 12+ 29              | -17.1 + 12.3 | GA01504  |
| FC10                                | -9.1        | 58.3          | -1 1   | 0.0 + 0.0     | 01+ 25              | -12.0 + 10.6 | GA01505  |
| FC11                                | _0.1        | 69.4          | -1.9   | 0.0 + 0.0     | 07+ 27              | 510+ 272     | GA01506  |
| FC12                                | -9.1        | 113.7         | -1.6   | 0.0 + 0.0     | -15+ 16             | -53+ 151     | GA01507  |
| FC13                                | 33.6        | 69.4          | -1.7   | 0.0 ± 0.0     |                     | -0.51 10.1   | GA01508  |
| EC14                                | _0.1        | 135.9         | -1.8   | 0.0 ± 0.0     | -1.5+ 1.6           | -137+ 111    | GA01509  |
| EC15                                | -5.1        | 3.0           | -1.0   | 0.0 ± 0.0     | -1.0 ± 1.0          | -14+ 160     | GA01510  |
| FC16                                | -0.1        | 135.9         | -1.8   | 0.0 + 0.0     | 07+ 27              | 73+ 218      | GA01511  |
| EC17                                | -9.1        | 25.1          | -1.0   | 0.0 + 0.0     | 0.1 + 2.5           | 2143+ 478    | GA01512  |
|                                     | 1.6         | 3.0           |        | 0.0 ± 0.0     | 29+ 34              | -166+ 85     | GA01513  |
| 14/424                              | 1.0         | 1137          | -1.0   | 0.0 ± 0.0     | -04+ 22             | -129+ 86     | GA01514  |
| WA3A                                | 1.6         | 180.2         | -1.0   | 0.0 + 0.0     | -10+ 19             | -166+ 85     | GA01515  |
| WAAA                                | - 01        | 91.6          | -11    | 0.0 + 0.0     | 01+ 25              | -157+ 85     | GA01516  |
| WA1B                                | 12.3        | -130.0        | -1.0   | 0.0 + 0.0     | 0.1 + 25            | -20.0 + 8.6  | GA01517  |
| WA2B                                | -91         | -52.4         | -1.0   | 0.8 + 15      | -10+ 19             | -226+ 79     | GA01518  |
| WA3B                                | -91         | 69.4          | -1.1   | 0.8+ 15       | 18± 31              | -17.0 + 8.4  | GA01519  |
| WAAR                                | 123         | 169.1         |        | 0.0+ 0.0      | 12+ 29              | -123+ 89     | GA01520  |
| W/R1A                               | 1.5         | -85.7         | -0.8   | 0.8+ 15       | -15+ 16             | -196+ 82     | GA01521  |
| WB1A                                | 9 1         | 224.5         | -0.9   | 0.8+ 15       | $-1.5 \pm 1.5$      | -183+ 81     | GA01522  |
| WB1B                                |             | 3.0           | -11    | 0.0 + 0.0     | 01+ 25              | -13.2 + 8.8  | GA01523  |
| WB1D                                |             | 490.3         | -10    | 0.0 + 0.0     | 12+ 29              | -72.3 + 8.6  | GA01524  |
| WO2D                                |             |               | -1.0   | 0.0 ± 0.0     | $0.7 \pm 2.5$       | -22.3 1 0.0  | GA01525  |
|                                     | -9.1        | -0.1          | -1.5   | 0.0± 0.0      | $0.7 \pm 2.7$       | 157 + 95     | GA01525  |
|                                     | -9.1        | 235.6         |        | 0.01 0.0      |                     | -13.7 ± 0.5  | GA01527  |
| WD IA                               | 22.5        | 233.0<br>60.4 | -1.4   | 0.0 ± 0.0     | 1.0 ± 3.1           | -10.3 ± 0.3  | GA01527  |
|                                     | 1.0.        | 26.2          | -1.4   | 0.0 ± 0.0     | 1.0 I J.1           | -10.3 I 0.3  | GA01520  |
| WD1B                                | -9.1        | 30.2          | -1.3   |               | -1.UI 1.9           | -10,2 I 0.0  | GA01529  |
|                                     | 12.3        | 14.0<br>52.4  | -1.3   |               | 121 2.9             | -10.7 I 0.0  | GA01530  |
|                                     | 1.0         | -02.4         | -1.5   |               | 1.2 1 2.9           | -10,1 I 0./  | GA01522  |
| WEZA                                | 12.3        | 110.7         | -1.5   |               |                     | -17.9 I 0.3  | GA01532  |
|                                     | -9.1        | 112.7         | -1.5   |               | -0.1 = 1.9          | -15.2 I 0.4  | GA01533  |
|                                     | 1.0         | 10.7          | -1.5   | 0.4 1.1       | -0.12 1.9           | -20.0 I 0.3  | GA01525  |
| WESA                                | 12.3        | -13.2         | -1.0   | -U.2 I U.I    | 1.0 ± 2.0           | -10.3 I 0./  | GA01535  |
| WEDA                                | 1.0         | 14.0          | -1.0   |               | -U.JI 1./           | -10.0 I 0./  | GA01530  |
| VVETB                               | 33.0        | -152.1        | -1.0   | -0.2 ± 0.1    | $1.2 \pm 2.4$       | -17.0 I 0.4  | GA01537  |
| JVVEZB                              | J -9.1      | J 14.0        | J -1.0 | j -∪.∠≖ 0.1 - | J U.4 I Z.1         | 1 -10.UI 8.3 | 10/10/20 |

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|            |             | Fo          | rt Meade, | Building 2805 | Hallway)            |             |         |
|------------|-------------|-------------|-----------|---------------|---------------------|-------------|---------|
| Location   |             | Monitoring  |           |               | Wipe Test           |             |         |
| Code       | Alpha       | Beta        | Gamma     | Alpha         | Beta                | LS          | Wipe    |
| (Units =>) | dpm/100cm^2 | dpm/100cm^2 | uR/hr     | dpr           | n/100cm^2 +/- 2 sig | ma          | Number  |
| (Bkgd =>)  | 1.7         | 149.47      | 5.00      | 0.0           | 2.0                 | 29.0        |         |
| (MDA =>)   | 54          | 401         | •         | 2.1           | 2.4                 | 60.1        | -       |
| WE3B       | 12.3        | 36.2        | -1.5      | -0.2 ± 0.1    | 0.4 ± 2.1           | -20.8 ± 8.2 | GA01539 |
| WE4B       | -9.1        | 47.3        | -1.5      | -0.2 ± 0.1    | 2.0 ± 2.6           | -18.8 ± 8.4 | GA01540 |
| WE5B       | -9.1        | -30.3       | -1.5      | 1.6 ± 2.0     | 2.0 ± 2.6           | -21.3 ± 8.2 | GA01541 |
| WE6B       | 1.6         | -130.0      | -1.7      | 1.0 ± 1.6     | 1.2 ± 2.4           | -18.3 ± 8.5 | GA01542 |
| WF1A       | 33.6        | 124.8       | -1.5      | 1.0 ± 1.6     | 0.8 ± 2.2           | -19.2 ± 8.4 | GA01543 |
| WF2A       | -9.1        | 191.3       | -1.4      | -0.2 ± 0.1    | -1.3 ± 1.2          | -19.6 ± 8.4 | GA01544 |
| WF1B       | -9.1        | 47.3        | -1.3      | -0.2 ± 0.1    | 1.6 ± 2.5           | -12.5 ± 9.0 | GA01545 |
| WF2B       | -9.1        | -8.1        | -1.2      | -0.2 ± 0.1    | 0.4 ± 2.1           | -17.5 ± 8.6 | GA01546 |
| WG1A       | 1.6         | 58.3        | -1.2      | 0.4 ± 1.1     | 1.2 ± 2.4           | -17.9 ± 8.5 | GA01547 |
| WG2A       | -9.1        | -41.3       | -1.2      | -0.2 ± 0.1    | 1.6 ± 2.5           | -17.5 ± 8.6 | GA01548 |
| WG1B       | 12.3        | 279.9       | -1.1      | -0.2 ± 0.1    | 0.4 ± 2.1           | -13.3 ± 8.9 | GA01549 |
| QA         | N/A         | N/A         | N/A       | -0.2 ± 0.1    | 2.5 ± 2.8           | -22.5 ± 8.1 | GA01550 |
| WG2B       | 1.6         | -141.0      | -1.5      | -0.2 ± 0.1    | -0.1 ± 1.9          | -18.0 ± 8.3 | GA01551 |
| WH1A       | 1.6         | 213.4       | -1.6      | 1.6 ± 2.0     | 1.2 ± 2.4           | -13.5 ± 8.7 | GA01552 |
| WH2A       | 1.6         | 169.1       | -1.6      | 0.4 ± 1.1     | 0.8 ± 2.2           | -18.8 ± 8.2 | GA01553 |
| WH1B       | -9.1        | 135.9       | -1.5      | -0.2 ± 0.1    | -0.1 ± 1.9          | -17.6 ± 8.4 | GA01554 |
| WH2B       | 1.6         | 257.7       | -1.4      | -0.2 ± 0.1    | -0.5 ± 1.7          | -20.4 ± 8.1 | GA01555 |
| WI1A       | 12.3        | -130.0      | -1.5      | -0.2 ± 0.1    | -0.5 ± 1.7          | -18.0 ± 8.3 | GA01556 |
| WI2A       | 1.6         | 58.3        | -1.7      | 0.4 ± 1.1     | -0.9 ± 1.5          | -18.8 ± 8.4 | GA01557 |
| WI3A       | -9.1        | 335.3       | -1.8      | 1.6 ± 2.0     | 0.4 ± 2.1           | -18.0 ± 8.3 | GA01558 |
| WI4A       | -9.1        | 235.6       | -2.0      | -0.2 ± 0.1    | 0.4 ± 2.1           | -17.9 ± 8.5 | GA01559 |
| WI1B       | -9.1        | 191.3       | -1.8      | -0.2 ± 0.1    | 0.8 ± 2.2           | -15.9 ± 8.5 | GA01560 |
| WI2B       | -9.1        | 180.2       | -2.0      | -0.2 ± 0.1    | -1.3 ± 1.2          | -13.1 ± 8.8 | GA01561 |
| WI3B       | 1.6         | -52.4       | -1.8      | -0.2 ± 0.1    | 1.2 ± 2.4           | -18.8 ± 8.2 | GA01562 |
| WI4B       | -9.1        | -8.1        | -1.9      | -0.2 ± 0.1    | 0.4 ± 2.1           | -18.8 ± 8.2 | GA01563 |
| WJ1A       | -9.1        | -163.2      | -2.1      | -0.2 ± 0.1    | 0.4 ± 2.1           | -16.3 ± 8.5 | GA01564 |
| WJ1B       | 12.3        | 102.6       | -2.1      | -0.2 ± 0.1    | -0.1 ± 1.9          | -20.4 ± 8.3 | GA01565 |
| WK1A       | -9.1        | / 1310.0    | -2.1      | -0.2 ± 0.1    | 1.2 ± 2.4           | -16.7 ± 8.6 | GA01566 |
| WK2A       | -9.1        | -85.7       | -1.8      | -0.2 ± 0.1    | 1.6 ± 2.5           | -14.6 ± 8.8 | GA01567 |
| WK3A       | 22.9        | -19.2       | -2.0      | -0.2 ± 0.1    | 1.2 ± 2.4           | -17.6 ± 8.4 | GA01568 |
| WK4A       | 1.6         | -41.3       | -2.0      | 0.3 ± 1.1     | 0.1 ± 1.9           | -17.9 ± 8.5 | GA01569 |
| WK5A       | -9.1        | 202.3       | -1.8      | -0.3 ± 0.2    | 0.1± 1.9            | -19.1 ± 8.6 | GA01570 |
| WK6A       | 33.6        | -118.9      | -1.8      | -0.3 ± 0.2    | 0.5 ± 2.1           | -20.4 ± 8.1 | GA01571 |
| WK7A       | 1.6         | 169.1       | -1.6      | 1.4 ± 2.0     | 0.5 ± 2.1           | -20.4 ± 8.1 | GA01572 |
| WK8A       | 12.3        | 3.0         | -1.9      | -0.3 ± 0.2    | 0.5 ± 2.1           | -13.9 ± 8.7 | GA01573 |
| WK9A       | -9.1        | -118.9      | -1.8      | -0.3 ± 0.2    | -0.7 ± 1.5          | -13.5 ± 8.7 | GA01574 |
| WK10A      | -9.1        | 25.1        | -1.9      | -0.3 ± 0.2    | 0.5 ± 2.1           | -17.9 ± 8.5 | GA01575 |
| WK11A      | -9.1        | 146.9       | -1.8      | -0.3 ± 0.2    | 2.2 ± 2.6           | -15.4 ± 8.8 | GA01576 |
| WK12A      | 1.6         | -8.1        | -1.7      | -0.3 ± 0.2    | 2.2 ± 2.6           | -16.7 ± 8.4 | GA01577 |
| WK13A      | 1.6         | 14.0        | -1.6      | 0.9± 1.6      | 2.2 ± 2.6           | -17.9 ± 8.5 | GA01578 |
| WK14A      | 1.6         | 124.8       | -1.6      | -0.3 ± 0.2    | 0.1 ± 1.9           | -17.1 ± 8.6 | GA01579 |
| WK15A      | -9.1        | 202.3       | -1.5      | 0.3 ± 1.1     | 0.5 ± 2.1           | -13.8 ± 8.9 | GA01580 |
| WK16A      | -9.1        | 102.6       | -1.2      | 0.3 ± 1.1     | -0.7 ± 1.5          | -17.9 ± 8.5 | GA01581 |
| WK17A      | -9.1        | -74.6       | -1.2      | -0.3 ± 0.2    | 0.5 ± 2.1           | -15.8 ± 8.7 | GA01582 |
| WK1B       | -9.1        | -174.3      | -1.6      | -0.3 ± 0.2    | 1.8 ± 2.5           | -10.8 ± 9.2 | GA01583 |
| WK2B       | -9.1        | -52.4       | -1.6      | 0.3 ± 1.1     | 1.4 ± 2.4           | -21.4 ± 9.7 | GA01584 |
| WK3B       | -9.1        | 47.3        | -1.7      | -0.3 ± 0.2    | 0.9 ± 2.2           | -16.7 ± 8.4 | GA01585 |
| WK4B       | 12.3        | 124.8       | -1.7      | -0.3 ± 0.2    | 1.4 ± 2.4           | -19.6 ± 8.4 | GA01586 |
| WK5B       | 12.3        | 324.2       | -1.5      | 0.3 ± 1.1     | 0.5 ± 2.1           | -15.1 ± 8.6 | GA01587 |
| WK6B       | -9.1        | 91.6        | -1.5      | 0.9 ± 1.6     | 0.5 ± 2.1           | -11.7 ± 9.1 | GA01588 |

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| ······     |             | Fo          | rt Meade,    | Building 2805 | (Hallway)           | · · · · · · · · · · · · · · · · · · · |         |
|------------|-------------|-------------|--------------|---------------|---------------------|---------------------------------------|---------|
| Location   |             | Monitoring  | nagé superio |               | Wipe Test           |                                       |         |
| Code       | Alpha       | Beta        | Gamma        | Alpha         | Beta                | LS                                    | Wipe    |
| (Units =>) | dpm/100cm^2 | dpm/100cm^2 | uR/hr -      | dp            | m/100cm^2 +/- 2 sig | ima                                   | Number  |
| (Bkgd =>)  | 1.7         | 149.47      | 5.00         | 0.0           | 2.0                 | 29.0                                  | 1       |
| (MDA =>)   | 54          | 401         | •            | 2.1           | 2.4                 | 60.1                                  | 1       |
| WK7B       | 1.6         | -141.0      | -1.6         | 0.3 ± 1.1     | 0.9 ± 2.2           | -22.4 ± 7.9                           | GA01589 |
| WK8B       | -9.1        | 180.2       | -1.8         | -0.3 ± 0.2    | 0.5 ± 2.1           | -12.7 ± 8.8                           | GA01590 |
| WK9B       | 22.9        | -85.7       | -1.7         | -0.3 ± 0.2    | 0.1 ± 1.9           | -20.4 ± 8.1                           | GA01591 |
| WK10B      | 12.3        | 58.3        | -1.6         | 0.3 ± 1.1     | -0.3 ± 1.7          | -15.1 ± 8.6                           | GA01592 |
| WK11B      | -9.1        | 113.7       | -1.6         | 0.3 ± 1.1     | 0.1 ± 1.9           | -15.9 ± 8.5                           | GA01593 |
| WK12B      | 1.6         | 3.0         | -1.6         | -0.3 ± 0.2    | 2.2 ± 2.6           | -16.7 ± 8.4                           | GA01594 |
| WK13B      | 1.6         | 124.8       | -1.3         | 0.9 ± 1.6     | 1.4 ± 2.4           | -15.0 ± 8.8                           | GA01595 |
| WK14B      | -9.1        | 213.4       | -1.1         | -0.3 ± 0.2    | 0.1 ± 1.9           | -14.3 ± 8.7                           | GA01596 |
| WK15B      | 12.3        | 135.9       | -1.0         | -0.3 ± 0.2    | 0.1 ± 1.9           | -21.7 ± 8.2                           | GA01597 |
| WK16B      | 1.6         | 58.3        | -1.3         | -0.3 ± 0.2    | 0.5 ± 2.1           | -18.3 ± 8.5                           | GA01598 |
| WK17B      | 12.3        | -185.4      | -1.4         | 0.3 ± 1.1     | 1.8 ± 2.5           | -14.3 ± 8.7                           | GA01599 |
| QA         | N/A         | N/A         | N/A          | -0.3 ± 0.2    | 0.1 ± 1.9           | -16.3 ± 8.7                           | GA01600 |
| WL1A       | -9.1        | -130.0      | -1.3         | 0.3 ± 1.1     | -0.7 ± 1.5          | -15.9 ± 8.5                           | GA01601 |
| WL1B       | 1.6         | 36.2        | -1.2         | -0.3 ± 0.2    | -1.2 ± 1.2          | -22.9 ± 8.8                           | GA01602 |

C-13-3



|            |             | Fo          | rt Meade, | Building 2805 | (Room 1)            |              |         |
|------------|-------------|-------------|-----------|---------------|---------------------|--------------|---------|
| Location   | <b>I</b>    | Monitoring  |           |               | Wipe Test           |              |         |
| Code       | Alpha       | Beta        | Gamma     | Alpha         | Beta                | LS           | Wipe    |
| (Units =>) | dpm/100cm^2 | dpm/100cm^2 | uR/hr     | dpi           | m/100cm^2 +/- 2 sig | ma`          | Number  |
| (Bkgd =>)  | 1.7         | 149.47      | 5.00      | 0.0           | 2.3                 | 25.3         | 1       |
| (MDA =>)   | 54          | 401         | -         | 2.6           | 2.8                 | 33.5         |         |
| FA1        | -9.1        | 257.7       | -0.9      | 0.0 ± 0.1     | -0.5 ± 2.3          | -10.6 ± 8.3  | GA00942 |
| FA2        | -9.1        | 36.2        | -0.9      | 0.0 ± 0.1     | -1.3 ± 2.7          | -15.3 ± 7.8  | GA00943 |
| FA3        | -9.1        | 69.4        | -0.8      | 0.0 ± 0.0     | 2.2 ± 3.3           | -11.5 ± 8.2  | GA00944 |
| FA4        | -9.1        | 113.7       | -0.9      | -0.5 ± 0.3    | 2.0 ± 3.7           | -16.4 ± 8.1  | GA00945 |
| FA5        | -9.1        | 58.3        | -0.8      | 0.0 ± 0.1     | 1.8 ± 3.2           | -8.7 ± 8.7   | GA00946 |
| FB1        | -9.1        | 191.3       | -0.6      | 0.0 ± 0.1     | -0.7 ± 2.9          | -15.9 ± 8.4  | GA00947 |
| FB2        | 1.6         | 291.0       | -0.9      | 0.0 ± 0.0     | 1.7 ± 3.1           | -12.6 ± 8.3  | GA00948 |
| FB3        | -9.1        | 224.5       | -0.9      | -0.5 ± 0.3    | -3.0 ± 1.7          | -11.4 ± 8.9  | GA00949 |
| QA         | N/A         | N/A         | N/A       | 0.0 ± 0.1     | -0.5 ± 2.3          | -11.8 ± 7.8  | GA00950 |
| FB4        | -9.1        | 191.3       | -0.8      | 0.0 ± 0.1     | -1.9 ± 2.4          | -8.7 ± 8.7   | GA00951 |
| FB5        | -9.1        | 135.9       | -0.4      | 0.0 ± 0.0     | 0.5 ± 2.6           | -14.8 ± 8.1  | GA00952 |
| FC1        | -9.1        | 390.6       | -0.6      | 0.3 ± 1.6     | -1.9 ± 2.3          | -12.3 ± 8.8  | GA00953 |
| FC2        | 22.9        | 246.6       | -0.6      | 0.0 ± 0.1     | 0.7 ± 2.8           | -16.6 ± 9.1  | GA00954 |
| FC3        | -9.1        | 246.6       | -0.6      | $0.0 \pm 0.1$ | -1.9 ± 2.4          | -13.5 ± 8.9  | GA00955 |
| FC4        | -9.1        | 69.4        | -0.5      | $0.0 \pm 0.0$ | 0.5 ± 2.6           | -14.4 ± 8.8  | GA00956 |
| FC5        | -9.1        | 246.6       | -0.6      | -0.5 ± 0.3    | -1.3 ± 2.5          | -13.6 ± 8.6  | GA00957 |
| FD2        | -9.1        | 146.9       | -0.8      | 0.0 ± 0.1     | -0.5 ± 2.3          | -11.4 ± 8.9  | GA00958 |
| FD3        | -9.1        | 235.6       | -0.9      | 0.0 ± 0.1     | -1.3 ± 2.7          | -14.9 ± 8.7  | GA00959 |
| FD4        | 1.6         | 213.4       | -0.7      | 0.0 ± 0.0     | -0.1 ± 2.4          | -17.6 ± 8.7  | GA00960 |
| ED5        | 1.6         | 224.5       | -0.6      | 0.3 ± 1.6     | -0.8 ± 2.8          | -14.0 ± 8.8  | GA00961 |
| FE1        | 22.9        | 135.9       | -0.8      | 0.7 ± 1.5     | $-0.5 \pm 2.3$      | -21.6 ± 9.7  | GA00962 |
| FF2        | -9.1        | 401.7       | -0.7      | $0.7 \pm 1.3$ | $-1.9 \pm 2.4$      | -18.6 ± 8.4  | GA00963 |
| FE3        | -9.1        | 368.5       | -0.7      | 0.9± 1.8      | 0.5 ± 2.6           | -17.8 ± 10.4 | GA00964 |
| FE4        | 12.3        | 268.8       | -0.7      | -0.5 ± 0.3    | -0.2 ± 3.0          | -16.3 ± 8.6  | GA00965 |
| FE5        | -9.1        | 36.2        | -0.8      | 0.0 ± 0.1     | 0.1 ± 2.5           | -12.3 ± 8.8  | GA00966 |
| FF1        | 1.6         | 224.5       | -0.5      | 0.0 ± 0.1     | -1.3 ± 2.7          | -23.8 ± 14.5 | GA00967 |
| FF2        | -9.1        | 401.7       | -0.6      | 0.0 ± 0.0     | 0.5 ± 2.6           | -21.2 ± 10.8 | GA00968 |
| FF3        | 1.6         | 302.0       | -0.7      | 0.3 ± 1.6     | 0.4 ± 3.2           | -14.8 ± 9.0  | GA00969 |
| FF4        | -9.1        | 434.9       | -0.6      | 0.0 ± 0.1     | -1.6 ± 1.7          | -18.1 ± 8.4  | GA00970 |
| FF5        | 1.6         | 213.4       | -0.6      | 0.0 ± 0.1     | -3.0 ± 1.8          | -15.8 ± 8.6  | GA00971 |
| FG1        | -9.1        | 291.0       | -0.4      | 0.0 ± 0.0     | 2.2 ± 3.3           | -31.1 ± 11.0 | GA00972 |
| FG2        | -9.1        | 69.4        | -0.3      | -0.5 ± 0.3    | -0.2 ± 3.0          | -33.1 ± 12.6 | GA00973 |
| FG3        | -9.1        | 313.1       | -0.5      | 0.0 ± 0.1     | 2.4 ± 3.4           | -23.3 ± 9.5  | GA00974 |
| FG4        | -9.1        | 135.9       | -0.5      | 0.0 ± 0.1     | -1.3 ± 2.7          | -22.8 ± 9.5  | GA00975 |
| FG5        | -9.1        | 346.3       | -0.6      | 0.0 ± 0.0     | 2.2 ± 3.3           | -23.7 ± 9.4  | GA00976 |
| WA1A       | -9.1        | 368.5       | -0.8      | 0.3 ± 1.6     | -1.3 ± 2.5          | -22.6 ± 8.5  | GA00977 |
| WA2A       | 1.6         | -96.7       | -0.6      | 0.7 ± 1.5     | -1.6 ± 1.7          | -17.9 ± 8.8  | GA00978 |
| WA3A       | 12.3        | 80.5        | -0.7      | 0.0 ± 0.1     | -0.1 ± 3.1          | -22.5 ± 8.3  | GA00979 |
| WA4A       | 1.6         | 113.7       | -0.6      | 0.0 ± 0.0     | -0.1 ± 2.4          | -17.4 ± 9.0  | GA00980 |
| WA5A       | 1.6         | 235.6       | -0.7      | -0.5 ± 0.3    | 0.9 ± 3.4           | -21.7 ± 8.6  | GA00981 |
| WA1B       | 12.3        | 25.1        | -0.8      | 0.0 ± 0.1     | 1.3 ± 3.0           | -8.6 ± 9.4   | GA00982 |
| WA2B       | -9.1        | 58.3        | -0.9      | 0.0 ± 0.1     | -0.1 ± 3.1          | -16.7 ± 8.9  | GA00983 |
| WA3B       | 1.6         | 102.6       | -1.1      | 0.9 ± 1.8     | 1.7 ± 3.1           | -20.4 ± 8.5  | GA00984 |
| WA4B       | 1.6         | 80.5        | -1.1      | -0.5 ± 0.3    | 0.9 ± 3.4           | -23.8 ± 8.2  | GA00985 |
| WA5B       | 1.6         | 113.7       | -1.0      | 0.0 ± 0.1     | -1.6 ± 1.7          | -22.0 ± 8.2  | GA00986 |
| WB1A       | 1.6         | 25.1        | -1.0      | 0.0 ± 0.1     | -1.3 ± 2.7          | -22.1 ± 8.6  | GA00987 |
| WB2A       | 1.6         | 69.4        | -1.0      | 0.0 ± 0.0     | -1.9 ± 1.3          | -16.3 ± 8.9  | GA00988 |
| WB3A       | 33.6        | 47.3        | -0.9      | 0.3 ± 1.6     | -0.8 ± 2.8          | -20.4 ± 8.5  | GA00989 |
| WB4A       | -9.1        | 135.9       | -0.7      | 0.0 ± 0.1     | -1.0 ± 2.0          | -19.2 ± 8.6  | GA00990 |
| WB5A       | 12.3        | 235.6       | -0.9      | 0.0 ± 0.1     | -0.7 ± 2.9          | -16.6 ± 9.1  | GA00991 |

C-14-1

|            |             | Fo          | rt Meade, | Building 2805  | Room 1)             |                 |         |
|------------|-------------|-------------|-----------|----------------|---------------------|-----------------|---------|
| Location   |             | Monitoring  |           |                | Wipe Test           |                 |         |
| Code       | Alpha       | Beta        | Gamma     | Alpha          | Beta                | LS              | Wipe    |
| (Units =>) | dpm/100cm^2 | dpm/100cm^2 | uR/hr     | dp             | n/100cm^2 +/- 2 sig | ma              | Number  |
| (Bkgd =>)  | 1.7         | 149.47      | 5.00      | 0.0            | 2.3                 | 25.3            | 1 [     |
| (MDA =>)   | 54          | 401         | -         | 2.6            | 2.8                 | 33.5            | 1.      |
| WB6A       | -9.1        | 36.2        | -1.1      | 0.0 ± 0.0      | -0.7 ± 2.1          |                 | GA00992 |
| WB7A       | 12.3        | -74.6       | -1.0      | 0.3 ± 1.6      | $-2.4 \pm 2.0$      | -20.0 + 8.6     | GA00993 |
| WB1B       | 1.6         | 235.6       | -1,1      | $0.0 \pm 0.1$  | 0.7 ± 2.8           | -22.4 ± 8.1     | GA00994 |
| WB2B       | 1.6         | 3.0         | -0.9      | $0.7 \pm 1.3$  | $-1.9 \pm 2.4$      | -143 ± 89       | GA00995 |
| WB3B       | 1.6         | 80.5        | -0.9      | $0.0 \pm 0.0$  | $-0.1 \pm 2.4$      | -20.8 ± 8.3     | GA00996 |
| WB4B       | -9.1        | -74.6       | -1.3      | $-0.5 \pm 0.3$ | $-1.9 \pm 2.3$      | $-14.2 \pm 9.1$ | GA00997 |
| WB5B       | -9.1        | -107.8      | -1.2      | 0.0 ± 0.1      | $-1.6 \pm 1.7$      | -17.5 ± 8.8     | GA00998 |
| WB6B       | -9.1        | -74.6       | -1.0      | $0.0 \pm 0.1$  | -0.7 ± 2.9          | -24.4 + 8.8     | GA00999 |
| QA         | N/A         | N/A         | N/A       | 0.9± 1.8       | $1.7 \pm 3.1$       | $-13.3 \pm 9.2$ | GA01000 |
| WB7B       | 1.6         | -74.6       | -1.4      | $0.3 \pm 1.6$  | $-0.2 \pm 3.0$      | -245 + 91       | GA01001 |
| WC1A       | -9.1        | -85.7       | -0.6      | $0.0 \pm 0.1$  | $-0.5\pm 2.3$       | -23.8 + 8.2     | GA01002 |
| WC2A       | -9.1        | 279.9       | -0.6      | $0.0 \pm 0.1$  | -0.7 ± 2.9          | -20.8 ± 8.5     | GA01003 |
| WC3A       | -9.1        | 36.2        | -0.4      | $0.0 \pm 0.0$  | $0.5 \pm 2.6$       | -232+ 92        | GA01004 |
| WC4A       | 12.3        | 335.3       | -0.4      | $-0.5 \pm 0.3$ | $-0.2 \pm 3.0$      | -191+ 93        | GA01005 |
| WC5A       | 1.6         | 169.1       | -0.4      | $0.0 \pm 0.1$  | $-0.5 \pm 2.3$      | -14.5 + 9.3     | GA01006 |
| WC1B       | -9.1        | 113.7       | -0.5      | $0.0 \pm 0.1$  | $1.1 \pm 3.5$       | -22.3 ± 9.6     | GA01007 |
| WC2B       | -9.1        | 135.9       | -0.5      | $0.0 \pm 0.0$  | 1.1 ± 2.9           | -20.8 ± 8.5     | GA01008 |
| WC3B       | -9.1        | 291.0       | -0.3      | $-0.5 \pm 0.3$ | $-0.2 \pm 3.0$      | -244+ 99        | GA01009 |
| WC4B       | 1.6         | 180.2       | -0.2      | $0.0 \pm 0.1$  | 0.1 + 2.5           | -226+ 88        | GA01010 |
| WC5B       | 22.9        | 335.3       | -0.1      | $0.0 \pm 0.1$  | -07+ 29             | -204 + 87       | GA01011 |
| WD1A       | 12.3        | 91.6        | 0.1       | $0.0 \pm 0.0$  | 0.5 + 2.6           | -184+ 85        | GA01012 |
| WD2A       | 12.3        | 268.8       | 0.0       | $-0.5 \pm 0.3$ | -13+ 25             | -165+ 93        | GA01013 |
| WD3A       | 12.3        | 47.3        | -0.5      | $0.0 \pm 0.1$  | $0.7 \pm 2.8$       | -28.1 + 8.0     | GA01014 |
| WD4A       | 1.6         | 146.9       | -0.8      | $0.0 \pm 0.1$  | $-1.3 \pm 2.7$      | -18.3 + 8.9     | GA01015 |
| WD5A       | -9.1        | 91.6        | -0.8      | $0.0 \pm 0.0$  | $-0.7 \pm 2.1$      | $-20.0 \pm 8.8$ | GA01016 |
| WD6A       | -9.1        | 313.1       | -0.6      | $-0.5 \pm 0.3$ | -3.0 ± 1.7          | -22.9 ± 8.6     | GA01017 |
| WD7A       | 10.1        | -152.1      | -0.7      | 0.0 ± 0.1      | $-2.2 \pm 1.2$      | $-23.8 \pm 8.7$ | GA01018 |
| WD1B       | -9.1        | -41.3       | -0.3      | 0.0 ± 0.1      | -1.9 ± 2.4          | -22.2 ± 9.1     | GA01019 |
| WD2B       | -9.1        | 335.3       | -0.2      | 0.9 ± 1.8      | 1.7 ± 3.1           | -22.5 ± 8.6     | GA01020 |
| WD3B       | -9.1        | 202.3       | -0.1      | -0.5 ± 0.3     | 1.5 ± 3.5           | -22.2 ± 9.4     | GA01021 |
| WD4B       | -9.1        | -130.0      | -0.2      | 0.0 ± 0.1      | -2.7 ± 0.5          | -21.7 ± 8.7     | GA01022 |
| WD5B       | -9.1        | 36.2        | -0.4      | 0.0 ± 0.1      | -0.7 ± 2.9          | -22.1 ± 8.7     | GA01023 |
| WD6B       | -9.1        | 279.9       | -0.5      | 0.0 ± 0.0      | 0.5 ± 2.6           | -23.9 ± 10.3    | GA01024 |
| WD7B       | 1.6         | 14.0        | -0.7      | -0.5 ± 0.3     | -0.8 ± 2.8          | -19.2 ± 8.9     | GA01025 |
| RSINK1     | 12.3        | 25.1        | -0.5      | 0.0 ± 0.1      | 2.4 ± 3.4           | -20.0 ± 9.3     | GA01026 |
| RCNT2      | -9.1        | 235.6       | -0.8      | 0.0 ± 0.1      | -2.4 ± 2.1          | -21.8 ± 9.4     | GA01027 |
| RD3        | -9.1        | 124.8       | -0.8      | 0.9 ± 1.8      | 3.4 ± 3.7           | -20.9 ± 9.5     | GA01028 |
| RD4        | -9.1        | 80.5        | -0.9      | 0.3 ± 1.6      | -0.8 ± 2.8          | -21.7 ± 9.2     | GA01029 |
| RCNT5      | 1.6         | 25.1        | -1.0      | 0.0 ± 0.1      | 1.3 ± 3.0           | -21.7 ± 8.9     | GA01030 |
| RD6        | -9.1        | 213.4       | -1.1      | 0.0 ± 0.0      | 0.1 ± 2.5           | -22.2 ± 9.1     | GA01031 |
| RCNT7      | -9.1        | 235.6       | -1.0      | 0.0 ± 0.0      | 2.3 ± 3.3           | -22.1 ± 8.9     | GA01032 |
| RD8        | -9.1        | 36.2        | -0.9      | 0.8 ± 1.5      | 37.3 ± 9.2          | -22.6 ± 9.1     | GA01033 |
| RD9        | -9.1        | 169.1       | -1.2      | 0.0 ± 0.0      | -1.5 ± 1.6          | -23.0 ± 9.1     | GA01034 |
| RNCT10     | -9.1        | 180.2       | -1.1      | 0.0 ± 0.0      | -1.0 ± 1.9          | -24.3 ± 8.9     | GA01035 |
| RD11       | -9.1        | 224.5       | -1.1      | 0.8 ± 1.5      | -0.4 ± 2.2          | -20,4 ± 9.1     | GA01036 |
| RCNT12     | 12.3        | 180.2       | -1.3      | 0.8 ± 1.5      | 2.9 ± 3.4           | -19.6 ± 9.4     | GA01037 |
| RSINK13    | -9.1        | 313.1       | -1.2      | 1.6 ± 2.2      | -1.0 ± 1.9          | -26.7 ± 9.8     | GA01038 |
| RD14       | 12.3        | 124.8       | -0.9      | 0.0 ± 0.0      | 0.1 ± 2.5           | -25,5 ± 9.3     | GA01039 |
| RCNT15     | 1.6         | 291.0       | -1.1      | 0.0 ± 0.0      | 0.1 ± 2.5           | -24.0 ± 9.2     | GA01040 |
| RD16       | -9.1        | 36.2        | -1.1      | 0.0 ± 0.0      | 2.9 ± 3.4           | -23.4 ± 8.8     | GA01041 |

C-14-2

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| Fort Meade, Building 2805 (Room 1) |             |             |       |                                                                                                                 |                         |              |         |  |
|------------------------------------|-------------|-------------|-------|-----------------------------------------------------------------------------------------------------------------|-------------------------|--------------|---------|--|
| Location                           | •••• · · ·  | Monitoring  |       | a de la companya de l | Wipe Test               |              |         |  |
| Code                               | Alpha       | Beta        | Gamma | Alpha                                                                                                           | Beta                    | LS           | Wipe    |  |
| (Units =>)                         | dpm/100cm^2 | dpm/100cm^2 | uR/hr | dp                                                                                                              | dpm/100cm^2 +/- 2 sigma |              |         |  |
| (Bkgd =>)                          | 1.7         | 149.47      | 5.00  | 0.0                                                                                                             | 2.3                     | 25.3         |         |  |
| (MDA =>)                           | 54          | 401         | • ·   | 2.6                                                                                                             | 2.8                     | 33.5         |         |  |
| RD17                               | 12.3        | 279.9       | -1.1  | 0.0 ± 0.0                                                                                                       | 3.4 ± 3.6               | -23.0 ± 9.1  | GA01042 |  |
| RVENT18                            | 1.6         | 390.6       | -0.8  | 1.6 ± 2.2                                                                                                       | 4.5 ± 3.9               | -45.2 ± 14.9 | GA01043 |  |

C-14-3

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |            |             | Fo          | rt Meade, | Building 2805  | (Room 3)            |                 |         |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-------------|-------------|-----------|----------------|---------------------|-----------------|---------|
| Code         Alpha         Beta         Gamma         Alpha         Deta         LS         Winds           (Units =>)         dpm/100cm*2 dpm/100cm*2 uR/ht         dpm/100cm*2 H/-2 sigma         humbh         humbh         humbh         humbh         humbh         humbh         humbh         humbh           (Units =>)         54         401         -         1.8         1.8         2.2         24.3         humbh           FA1         1.6         58.3         1.3         -0.2 ±         0.1         -0.5 ±         1.7         -16.1 ±         8.6         GA0109           FA3         -9.1         401.7         1.0         -0.2 ±         0.1         -0.5 ±         1.7         -16.5 ±         8.6         GA0109           FA3         -9.1         246.6         0.7         -0.2 ±         0.1         -0.1 ±         1.9         -20.3 ±         8.0         GA0109           FA4         1.6         335.3         0.5         0.4 ±         1.1         0.4 ±         2.1         -16.9 ±         8.5         GA0109           FB2         -9.1         276.8         0.5         1.0 ±         1.6         1.5         1.6         SA0110         -0.2 ±         0.1                                                                                                                        | Location   | I           | Monitoring  |           | [              | Wipe Test           | · · · · ·       |         |
| Tunis sol         dpm/100cm*2         ur/Nr         ur/Nr         ur/Nr         ur/Nr         ur/Nr         Number           (Bkgd =>)         1.7         149.47         5.00         0.2         2.2         24.3           (Bkgd =>)         1.7         149.47         5.00         0.2         2.2         24.3           FA1         1.6         58.3         1.3         0.22         0.1         0.5 ±         1.7         1.5 ±         8.6         GA0109           FA2         12.3         422.9         1.1         0.2 ±         0.1         1.2 ±         2.4         1.4.6 ±         8.3         GA0109           FA3         -9.1         246.6         0.7         0.2 ±         0.1         0.1 ±         1.9         -18.9 ±         8.0         GA0109           FA5         -9.1         246.6         0.7         0.2 ±         0.1         0.1 ±         1.4         0.4 ±         2.1         -16.9 ±         8.0         GA0109           FA5         -9.1         268.8         0.5         1.0 ±         1.6         -17.1 ±         8.4         GA010           FA1         -9.1         268.8         0.5         1.0 ±         1.1         1.3 ±                                                                                                                                             | Code       | Alpha       | Beta        | Gamma     | Alpha          | Beta                | LS              | Wipe    |
| (Bidg =>)         1.7         14947         5.00         0.2         2.2         24.3           (MDA =>)         54         401         -         1.8         1.8         28.5           FA1         1.6         58.3         1.3         -0.2±         0.1         -0.1±         1.9         -25.1±         9.9         GA0109           FA2         12.3         423.9         1.1         -0.2±         0.1         -0.5±         1.7         -15.8±         8.0         GA0109           FA3         -9.1         401.7         1.0         -0.2±         0.1         -0.5±         1.7         -15.8±         8.0         GA0109           FA5         -9.1         246.6         0.7         -0.2±         0.1         -0.1±         1.9         -18.9±         8.0         GA0109           FA6         -9.1         191.3         0.5         0.2±         0.1         -1.1±         1.4±         6.0         GA0110           FB1         -9.1         279.9         0.7         -0.2±         0.1         -0.1±         1.9         -11.3±         2.0         GA0110           FB2         -9.1         279.9         0.7         -0.2±         0.1                                                                                                                                                              | (Units =>) | dpm/100cm^2 | dpm/100cm^2 | uR/hr     | dpi            | m/100cm^2 +/- 2 sig | ma              | Number  |
| (NDA =>)         64         401         -         1.8         1.8         28.2           FA1         1.6         58.3         1.3         -0.2 ±         0.1         -0.1 ±         1.9         -25.1 ±         9.9         GA0109           FA2         12.3         423.9         1.1         -0.2 ±         0.1         1.2 ±         2.4         1.46.8         8.3         GA0109           FA3         -9.1         401.7         1.0         -0.2 ±         0.1         -0.5 ±         1.7         -15.8 ±         8.0         GA0109           FA4         1.6         313.1         0.9         -0.2 ±         0.1         -0.1 ±         1.9         -20.3 ±         8.0         GA0109           FA6         -9.1         191.3         0.5         -0.2 ±         0.1         -0.1 ±         1.9         -16.3 ±         6.0         GA0100           GA         N/A         N/A         N/A         0.4 ±         1.1         -13.2 ±         -14.1 ±         3.5         GA010           GA         9.1         268.8         0.5         1.0 ±         1.6 ±         1.5 ±         A0110         -0.2 ±         0.1         1.6 ±         3.6         GA0110                                                                                                                                                 | (Bkgd =>)  | 1.7         | 149.47      | 5.00      | 0.2            | 2.2                 | 24.3            | 1       |
| $\bar{PA1}$ 1.658.31.3 $-0.2\pm$ 0.1 $-0.1\pm$ 1.9 $-25.1\pm$ 9.9GA0109 $\bar{FA2}$ 1.2.3423.91.1 $-0.2\pm$ 0.1 $-0.5\pm$ 1.7 $-15.1\pm$ 8.6GA0109 $\bar{FA3}$ -9.1401.71.0 $-0.2\pm$ 0.1 $-0.5\pm$ 1.7 $-15.0\pm$ 8.0GA0109 $\bar{FA5}$ -9.1246.60.7 $-0.2\pm$ 0.1 $-0.1\pm$ 1.9 $-20.3\pm$ 8.0GA0109 $\bar{FA5}$ -9.1191.30.5 $-0.2\pm$ 0.1 $-0.1\pm$ 1.9 $-20.3\pm$ 8.0GA0109 $\bar{FA6}$ -9.1191.30.5 $0.2\pm$ 0.1 $-0.1\pm$ 1.9 $-18.9\pm$ 8.0GA0109 $\bar{FA6}$ -9.1268.80.5 $1.0\pm$ 1.5 $-0.1\pm$ $1.9$ $-18.1\pm$ 8.0GA0110 $\bar{FB2}$ -9.1268.80.5 $1.0\pm$ 1.5 $-0.1\pm$ $1.9$ $-18.1\pm$ 8.0GA0110 $\bar{FB4}$ 1.838.20.8 $0.2\pm$ 0.1 $1.6\pm$ $2.1+1\pm$ $4.4\pm$ $4.7\pm$ $7.9$ GA0110 $\bar{FB4}$ 1.6335.30.7 $-0.2\pm$ 0.1 $4.1\pm$ $3.2$ $-16.1\pm$ $8.3$ GA0110 $\bar{FB4}$ 1.6335.30.7 $-0.2\pm$ 0.1 $1.4\pm$ $2.4$ $-17.4\pm$ $7.9$ GA0110 $\bar{FB5}$ 1.6335.30.7 $-0.2\pm$ 0.1 $1.4\pm$ $2.4$ $-17.4\pm$ $7.9$ GA0110 $\bar{FB4}$ 1.6 <t< td=""><td>(MDA =&gt;)</td><td>54</td><td>401</td><td></td><td>1.8</td><td>1.8</td><td>26.2</td><td>1 .  </td></t<>                                                                                                                                                                                                                                        | (MDA =>)   | 54          | 401         |           | 1.8            | 1.8                 | 26.2            | 1 .     |
| FA2         12.3         423.9         1.1 $-0.2\pm$ 0.1 $-0.5\pm$ 1.7 $-1.5\pm$ 6.6         GA0109           FA3         -9.1         401.7         1.0 $-0.2\pm$ 0.1 $1.2\pm$ $2.4$ $-1.4.5\pm$ 8.3         GA0109           FA4         1.6         313.1         0.9 $-0.2\pm$ 0.1 $-0.1\pm$ 1.9 $-0.3\pm$ 8.0         GA0109           FA6         -9.1         246.6         0.7 $-0.2\pm$ 0.1 $-0.1\pm$ 1.9 $-0.3\pm$ 8.0         GA0109           FA6         -9.1         246.6         0.7 $-0.2\pm$ 0.1 $-0.4\pm$ $-1.6\pm$ $-1.8\pm$ GA0109           FB7         -9.1         258.8         0.5         1.0± $1.6$ $-0.2\pm$ $0.1$ $-1.8\pm$ GA0110           FB2         -9.1         279.9         0.7 $-0.2\pm$ $0.1$ $1.4\pm$ $2.4$ $-17.4\pm$ $8.0$ GA0110           FB6         1.6         357.4         0.9 $-0.2\pm$ $0.1$ $0.5\pm$ $1.7$                                                                                                                                                                                                                                                                                                                                                                                                                                                             | FA1        | 1.6         | 58.3        | 1.3       | -0.2 ± 0.1     | -0.1 ± 1.9          | -25.1 ± 9.9     | GA01093 |
| $ \begin{array}{c c c c c c c c c c c c c c c c c c c $                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | FA2        | 12.3        | 423.9       | 1.1       | -0.2 ± 0.1     | -0.5 ± 1.7          | -15.1 ± 8.6     | GA01094 |
| $ \begin{array}{c c c c c c c c c c c c c c c c c c c $                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | FA3        | -9.1        | 401.7       | 1.0       | -0.2 ± 0.1     | 1.2 ± 2.4           | -14.6 ± 8.3     | GA01095 |
| $ \begin{array}{c c c c c c c c c c c c c c c c c c c $                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | FA4        | 1.6         | 313.1       | 0.9       | -0.2 ± 0.1     | -0.5 ± 1.7          | -15.8 ± 8.0     | GA01096 |
| $ \begin{array}{c c c c c c c c c c c c c c c c c c c $                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | FA5        | -9.1        | 246.6       | 0.7       | -0.2 ± 0.1     | -0.1 ± 1.9          | -20.3 ± 8.0     | GA01097 |
| FB1         -9.1         335.3         0.5         0.4±         1.1         0.4±         2.1         -16.9±         8.5         GA0109           GA         N/A         N/A         N/A         N/A         N/A         O.4±         1.1         -1.3±         1.2         -14.3±         7.7         GA0110           FB2         -9.1         286.8         0.5         1.0±         1.6         -0.1±         1.9         -18.1±         8.8         GA0110           FB3         -9.1         279.9         0.7         -0.2±         0.1         1.6±         2.5         -17.1±         8.4         GA0110           FB5         1.6         335.3         0.7         -0.2±         0.1         1.6±         2.5         -17.1±         8.3         GA0110           FC2         -9.1         169.1         1.0         -0.2±         0.1         -0.1±         1.9         -11.3±         8.5         GA0110           FC2         -9.1         479.3         1.0         -0.2±         0.1         -0.1±         1.9         -20.5±         8.3         GA0111           FC3         -9.1         25.7         1.1         0.2±         0.1         -0.9± <td< td=""><td>FA6</td><td>-9.1</td><td>191.3</td><td>0.5</td><td>-0.2 ± 0.1</td><td>-0.1 ± 1.9</td><td>-18.9 ± 8.9</td><td>GA01098</td></td<>           | FA6        | -9.1        | 191.3       | 0.5       | -0.2 ± 0.1     | -0.1 ± 1.9          | -18.9 ± 8.9     | GA01098 |
| QA         N/A         N/A         0.4 ± 1.1         -1.3 ± 1.2         -14.3 ± 7.7         GA0110           FB2         -9.1         268.8         0.5         1.0 ± 1.6         -0.1 ± 1.9         -18.1 ± 8.8         GA0110           FB3         -9.1         279.9         0.7         -0.2 ± 0.1         -0.5 ± 1.7         -18.5 ± 8.0         GA0110           FB4         1.6         35.3         0.7         -0.2 ± 0.1         1.6 ± 2.5         -17.1 ± 8.4         GA0110           FB6         1.6         357.4         0.9         -0.2 ± 0.1         -0.1 ± 1.9         -11.3 ± 8.5         GA0110           FC1         -9.1         199.1         1.0         -0.2 ± 0.1         -0.1 ± 1.9         -11.3 ± 8.5         GA0110           FC2         -9.1         479.3         1.0         -0.2 ± 0.1         -0.5 ± 1.7         -21.0 ± 8.0         GA0110           FC4         33.6         146.9         1.0         -0.2 ± 0.1         -0.5 ± 1.7         -19.0 ± 8.7         GA0111           FC5         12.3         257.7         1.1         -0.2 ± 0.1         -0.9 ± 1.5         -15.5 ± 8.3         GA0111           FD2         1.6         235.6         1.2         -0.2 ± 0.1         -0.9                                                                                           | FB1        | -9.1        | 335.3       | 0.5       | 0.4 ± 1.1      | 0.4 ± 2.1           | -16.9 ± 8.5     | GA01099 |
| FB2         -9.1         268.8         0.5         1.0±         1.6         -0.1±         1.9         -18.1±         8.8         GA0110           FB3         -9.1         279.9         0.7         -0.2±         0.1         -0.5±         1.7         -18.5±         8.0         GA0110           FB4         1.6         362.2         0.1         1.6±         2.5         -17.1±         8.4         GA0110           FB5         1.6         335.3         0.7         -0.2±         0.1         4.1±         3.2         -16.1±         8.3         GA0110           FC1         -9.1         169.1         1.0         -0.2±         0.1         -0.1±         1.9         -11.3±         6.6         GA0110           FC2         -9.1         102.6         1.0         0.4±         1.1         0.8±         2.2         -16.6±         8.1         GA0110           FC3         -9.1         102.6         1.0         0.4±         1.1         0.8±         2.2         -16.6±         8.1         GA0111           FC4         33.6         146.9         1.0         -0.2±         0.1         -0.9±         1.5         -15.0±         8.3         GA0111                                                                                                                                                  | QA         | N/A         | N/A         | N/A       | 0.4 ± 1.1      | -1.3 ± 1.2          | -14.3 ± 7.7     | GA01100 |
| FB3-9.1279.90.7 $-0.2 \pm 0.1$ $-0.5 \pm 1.7$ $-18.5 \pm 8.0$ GA0110FB41.6336.20.8 $-0.2 \pm 0.1$ $1.6 \pm 2.5$ $-17.1 \pm 8.4$ GA0110FB51.6335.30.7 $-0.2 \pm 0.1$ $4.1 \pm 3.2$ $-16.1 \pm 8.3$ GA0110FC19.1169.11.0 $-0.2 \pm 0.1$ $-0.1 \pm 2.4$ $-17.4 \pm 7.9$ GA0110FC2-9.1479.31.0 $-0.2 \pm 0.1$ $-0.1 \pm 1.9$ $-11.3 \pm 8.5$ GA0110FC3-9.1102.61.0 $-0.2 \pm 0.1$ $-0.1 \pm 1.9$ $-11.3 \pm 8.5$ GA0110FC433.6146.91.0 $-0.2 \pm 0.1$ $-0.1 \pm 1.9$ $-20.5 \pm 8.3$ GA0110FC512.3257.71.1 $-0.2 \pm 0.1$ $-0.5 \pm 1.7$ $-18.0 \pm 8.7$ GA0111FC6-9.125.11.0 $-0.2 \pm 0.1$ $-0.9 \pm 1.5$ $-15.0 \pm 8.3$ GA0111FD322.9224.51.2 $-0.2 \pm 0.1$ $-0.9 \pm 1.5$ $-15.5 \pm 8.1$ GA0111FD41.6457.11.1 $0.4 \pm 1.1$ $-0.9 \pm 1.5$ $-15.5 \pm 8.5$ GA0111FD5-9.1302.01.0 $-0.2 \pm 0.1$ $-0.9 \pm 1.5$ $-15.9 \pm 8.5$ GA0111FD6-9.1302.01.0 $-0.2 \pm 0.1$ $-0.9 \pm 1.5$ $-16.9 \pm 8.5$ GA0111FD41.6169.10.6 $-0.2 \pm 0.1$ $-0.1 \pm 1.9$ $-9.1 \pm 7.8$ GA0111FD41.6169.10.6 $-0.2 \pm 0.1$ $-0.1 \pm 1.9$                                                                                                                                                                                                                                                                                                  | FB2        | -9.1        | 268.8       | 0.5       | 1.0 ± 1.6      | -0.1 ± 1.9          | -18.1 ± 8.8     | GA01101 |
| FB41.6 $36.2$ 0.8 $-0.2 \pm 0.1$ $1.6 \pm 2.5$ $-17.1 \pm 8.4$ GA0110FB51.6 $335.3$ 0.7 $-0.2 \pm 0.1$ $4.1 \pm 3.2$ $-16.1 \pm 8.3$ GA0110FB61.6 $357.4$ 0.9 $-0.2 \pm 0.1$ $1.2 \pm 2.4$ $-17.4 \pm 7.9$ GA0110FC1-9.1169.11.0 $-0.2 \pm 0.1$ $0.1 \pm 1.9$ $-17.4 \pm 7.9$ GA0110FC2-9.1479.31.0 $-0.2 \pm 0.1$ $-0.5 \pm 1.7$ $-21.0 \pm 8.0$ GA0110FC3-9.1102.61.0 $0.4 \pm 1.1$ $0.8 \pm 2.2$ $-16.6 \pm 8.1$ GA0110FC433.6146.91.0 $-0.2 \pm 0.1$ $-0.5 \pm 1.7$ $-19.0 \pm 8.7$ GA0110FC512.3257.71.1 $-0.2 \pm 0.1$ $-0.9 \pm 1.5$ $-15.0 \pm 8.3$ GA0111FC6-9.125.11.0 $-0.2 \pm 0.1$ $-0.9 \pm 1.5$ $-15.0 \pm 8.3$ GA0111FD21.6235.61.2 $-0.2 \pm 0.1$ $-0.9 \pm 1.5$ $-15.0 \pm 8.3$ GA0111FD41.6457.11.1 $0.4 \pm 1.1$ $-0.9 \pm 1.5$ $-15.9 \pm 8.5$ GA0111FD5-9.1386.51.0 $1.0 \pm 1.6$ $-0.5 \pm 1.7$ $-13.4 \pm 9.7$ GA0111VA1A33.668.30.6 $-0.2 \pm 0.1$ $-0.9 \pm 1.5$ $-15.9 \pm 8.5$ GA0111VA1A33.668.30.6 $-0.2 \pm 0.1$ $0.8 \pm 2.2$ $-18.4 \pm 9.1$ GA0111VA3A1.6169.10.6 $5.0 \pm 3.4$ $3.3 \pm 3.0$ $-$                                                                                                                                                                                                                                                                                         | FB3        | -9.1        | 279.9       | 0.7       | -0.2 ± 0.1     | -0.5 ± 1.7          | -18.5 ± 8.0     | GA01102 |
| FBS         1.6         335.3         0.7         -0.2 ±         0.1         4.1 ±         3.2         -16.1 ±         8.3         GA0110           FB6         1.6         357.4         0.9         -0.2 ±         0.1         1.2 ±         2.4         -17.4 ±         7.9         GA0110           FC1         -9.1         169.1         1.0         -0.2 ±         0.1         -0.1 ±         1.9         -11.3 ±         8.5         GA0110           FC2         -9.1         479.3         1.0         -0.2 ±         0.1         -0.5 ±         1.7         -21.0 ±         8.0         GA0110           FC3         -9.1         102.6         1.0         0.4 ±         1.1         0.8 ±         2.2         -16.6 ±         8.1         GA0111           FC4         33.6         146.9         1.0         -0.2 ±         0.1         -0.9 ±         1.5         -15.0 ±         8.3         GA0111           FC5         12.3         257.7         1.1         -0.2 ±         0.1         -0.9 ±         1.5         -15.0 ±         8.3         GA0111           FD4         1.6         1.6         255.6         1.2         -0.2 ±         0.1         -0.9 ±                                                                                                                                         | FB4        | 1.6         | 36.2        | 0.8       | -0.2 ± 0.1     | 1.6 ± 2.5           | -17.1 ± 8.4     | GA01103 |
| FB61.6 $357.4$ 0.9 $-0.2\pm$ 0.1 $1.2\pm$ $2.4$ $-17.4\pm$ $7.9$ GA0110FC1-9.1169.11.0 $-0.2\pm$ 0.1 $-0.1\pm$ 1.9 $-11.3\pm$ 8.5GA0110FC2-9.1479.31.0 $-0.2\pm$ 0.1 $-0.5\pm$ 1.7 $-21.0\pm$ 8.0GA0110FC3-9.1102.61.0 $-0.2\pm$ 0.1 $-0.1\pm$ 1.9 $-20.5\pm$ 8.3GA0110FC433.6146.91.0 $-0.2\pm$ 0.1 $-0.1\pm$ 1.9 $-20.5\pm$ 8.3GA0111FC6-9.125.11.0 $-0.2\pm$ 0.1 $-0.9\pm$ 1.5 $-15.0\pm$ 8.3GA0111FD21.6235.61.2 $-0.2\pm$ 0.1 $-0.9\pm$ 1.5 $-15.0\pm$ 8.3GA0111FD322.9224.51.2 $-0.2\pm$ 0.1 $-0.9\pm$ 1.5 $-15.9\pm$ 8.5GA0111FD41.6457.11.1 $0.4\pm$ 1.1 $-0.9\pm$ 1.5 $-16.9\pm$ 8.5GA0111WA1A33.658.30.6 $-0.2\pm$ 0.1 $0.1\pm$ 1.9 $-19.1\pm$ 7.6GA0111WA2A1.6169.10.8 $-0.2\pm$ 0.1 $0.4\pm$ 2.1 $-11.1\pm$ 8.4GA0111WA3A1.6169.10.5 $-0.2\pm$ 0.1 $0.4\pm$ 2.1 $-10.1\pm$ 8.3GA0111WA3A1.6169.10.5 $-0.2\pm$ 0.1 $0.4\pm$ 2.1 $-10.1$                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | FB5        | 1.6         | 335.3       | 0.7       | -0.2 ± 0.1     | 4.1 ± 3.2           | -16.1 ± 8.3     | GA01104 |
| $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | FB6        | 1.6         | 357.4       | 0.9       | -0.2 ± 0.1     | 1.2 ± 2.4           | -17.4 ± 7.9     | GA01105 |
| FC2-9.1479.31.0 $-0.2 \pm 0.1$ $-0.5 \pm 1.7$ $-21.0 \pm 8.0$ GA0110FC3-9.1102.61.0 $0.4 \pm 1.1$ $0.8 \pm 2.2$ $-16.6 \pm 8.1$ GA0110FC433.6146.91.0 $-0.2 \pm 0.1$ $-0.1 \pm 1.9$ $-20.5 \pm 8.3$ GA0110FC512.3257.71.1 $-0.2 \pm 0.1$ $-0.1 \pm 1.9$ $-20.5 \pm 8.3$ GA0110FC6-9.125.11.0 $-0.2 \pm 0.1$ $-0.9 \pm 1.5$ $-15.0 \pm 8.3$ GA0111FD21.6235.61.2 $-0.2 \pm 0.1$ $-0.9 \pm 1.5$ $-15.5 \pm 8.3$ GA0111FD322.9224.51.2 $-0.2 \pm 0.1$ $-0.9 \pm 1.5$ $-16.9 \pm 8.5$ GA0111FD41.6457.11.1 $0.4 \pm 1.1$ $-0.9 \pm 1.5$ $-16.9 \pm 8.5$ GA0111FD6-9.1302.01.0 $-0.2 \pm 0.1$ $-0.1 \pm 1.9$ $-19.1 \pm 7.8$ GA0111WA1A33.658.30.6 $-0.2 \pm 0.1$ $0.8 \pm 2.2$ $-18.4 \pm 9.1$ GA0111WA2A1.6-30.30.5 $1.0 \pm 1.6$ $0.4 \pm 2.1$ $-21.1 \pm 8.4$ GA0111WA3A-9.125.10.6 $5.0 \pm 3.4$ $3.3 \pm 3.0$ $-20.4 \pm 8.1$ GA0111WA4A-9.125.10.6 $5.0 \pm 3.4$ $3.3 \pm 3.0$ $-20.4 \pm 8.1$ GA0112WA5A1.691.60.5 $-0.2 \pm 0.1$ $0.4 \pm 2.1$ $-10.1 \pm 8.3$ GA0112WA4A-9.125.10.6 $5.0 \pm 3.4$ $3.3 \pm 3.0$ $-20.2 $                                                                                                                                                                                                                                                                                               | FC1        | -9.1        | 169.1       | 1.0       | -0.2 ± 0.1     | -0.1 ± 1.9          | -11.3 ± 8.5     | GA01106 |
| $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | FC2        | -9.1        | 479.3       | 1.0       | -0.2 ± 0.1     | -0.5 ± 1.7          | -21.0 ± 8.0     | GA01107 |
| $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | FC3        | -9.1        | 102.6       | 1.0       | 0.4 ± 1.1      | 0.8 ± 2.2           | -16.6 ± 8.1     | GA01108 |
| FC5         12.3         257.7         1.1         .0.2 ±         0.1         -0.5 ±         1.7         -19.0 ±         8.7         GA0111           FC6         -9.1         25.1         1.0         -0.2 ±         0.1         -0.9 ±         1.5         -15.0 ±         8.3         GA0111           FD2         1.6         235.6         1.2         -0.2 ±         0.1         -0.9 ±         1.5         -15.5 ±         9.1         GA0111           FD3         22.9         224.5         1.2         -0.2 ±         0.1         -0.9 ±         1.5         -16.9 ±         8.5         GA0111           FD4         1.6         457.1         1.1         0.4 ±         1.1         -0.9 ±         1.5         -16.9 ±         8.5         GA0111           FD6         -9.1         302.0         1.0         -0.2 ±         0.1         -0.1 ±         1.9         -19.1 ±         7.8         GA0111           WA1A         33.6         58.3         0.6         -0.2 ±         0.1         0.4 ±         2.1         -10.1 ±         8.3         GA0111           WA3A         1.6         169.1         0.8         -0.2 ±         0.1         0.4 ±         2.1                                                                                                                                        | FC4        | 33.6        | 146.9       | 1.0       | -0.2 ± 0.1     | -0.1 ± 1.9          | -20.5 ± 8.3     | GA01109 |
| $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | FC5        | 12.3        | 257.7       | 1.1       | -0.2 ± 0.1     | -0.5 ± 1.7          | -19.0 ± 8.7     | GA01110 |
| FD2         1.6         235.6         1.2         -0.2 ±         0.1         -0.9 ±         1.5         -24.7 ±         8.5         GA0111           FD3         22.9         224.5         1.2         -0.2 ±         0.1         -0.9 ±         1.5         -15.5 ±         9.1         GA0111           FD4         1.6         457.1         1.1         0.4 ±         1.1         -0.9 ±         1.5         -16.9 ±         8.5         GA0111           FD6         -9.1         368.5         1.0         1.0 ±         1.6         -0.5 ±         1.7         -13.4 ±         9.7         GA0111           WA1A         33.6         58.3         0.6         -0.2 ±         0.1         0.8 ±         2.2         -18.4 ±         9.1         GA0111           WA2A         1.6         -30.3         0.5         1.0 ±         1.6         0.4 ±         2.1         -21.1 ±         8.4         GA0111           WA2A         1.6         169.1         0.8         -0.2 ±         0.1         0.4 ±         2.1         -10.1 ±         8.3         GA0112           WA3A         1.6         91.6         0.5         -0.2 ±         0.1         0.4 ±         2.1                                                                                                                                            | FC6        | -9.1        | 25.1        | 1.0       | $-0.2 \pm 0.1$ | -0.9± 1.5           | $-15.0 \pm 8.3$ | GA01111 |
| FD322.9224.51.2 $-0.2 \pm 0.1$ $-0.9 \pm 1.5$ $-15.5 \pm 9.1$ GA0111FD41.6457.11.1 $0.4 \pm 1.1$ $-0.9 \pm 1.5$ $-16.9 \pm 8.5$ GA0111FD5-9.1368.51.0 $1.0 \pm 1.6$ $-0.5 \pm 1.7$ $-13.4 \pm 9.7$ GA0111FD6-9.1302.01.0 $-0.2 \pm 0.1$ $-0.1 \pm 1.9$ $-19.1 \pm 7.8$ GA0111WA1A33.658.30.6 $-0.2 \pm 0.1$ $-0.1 \pm 1.9$ $-19.1 \pm 7.8$ GA0111WA2A1.6-30.30.5 $1.0 \pm 1.6$ $0.4 \pm 2.1$ $-11.1 \pm 8.4$ GA0111WA3A1.6169.10.8 $-0.2 \pm 0.1$ $0.4 \pm 2.1$ $-10.1 \pm 8.3$ GA0111WA4A-9.125.10.6 $5.0 \pm 3.4$ $3.3 \pm 3.0$ $-20.4 \pm 8.1$ GA0111WA5A1.691.60.5 $-0.2 \pm 0.1$ $2.0 \pm 2.6$ $-13.7 \pm 7.9$ GA0112WA5A1.691.60.5 $-0.2 \pm 0.1$ $2.0 \pm 2.6$ $-13.7 \pm 7.9$ GA0112WA4B-9.158.30.8 $-0.2 \pm 0.1$ $-0.5 \pm 1.7$ $-15.1 \pm 7.9$ GA0112WA4B-9.158.30.8 $-0.2 \pm 0.1$ $-0.5 \pm 1.7$ $-15.1 \pm 7.9$ GA0112WA4B9.1224.50.6 $-0.2 \pm 0.1$ $-0.5 \pm 1.7$ $-15.1 \pm 7.9$ GA0112WA4B9.1224.50.6 $-0.2 \pm 0.1$ $-0.5 \pm 1.7$ $-15.1 \pm 7.9$ GA0112WA5B-9.136.20.4 $-0.2 \pm 0.1$ $-0.5 \pm 1.7$ $-$                                                                                                                                                                                                                                                                                               | FD2        | 1.6         | 235.6       | 1.2       | -0.2 ± 0.1.    | -0.9 ± 1.5          | -24.7 ± 8.5     | GA01112 |
| FD4         1.6         457.1         1.1         0.4 ±         1.1         -0.9 ±         1.5         -16.9 ±         8.5         GA0111           FD5         -9.1         368.5         1.0         1.0 ±         1.6         -0.5 ±         1.7         -13.4 ±         9.7         GA0111           WA1A         33.6         58.3         0.6         -0.2 ±         0.1         -0.1 ±         1.9         -19.1 ±         7.8         GA0111           WA1A         33.6         58.3         0.6         -0.2 ±         0.1         0.8 ±         2.2         -18.4 ±         9.1         GA0111           WA3A         1.6         169.1         0.8         -0.2 ±         0.1         0.4 ±         2.1         -10.1 ±         8.3         GA0111           WA3A         1.6         169.1         0.8         -0.2 ±         0.1         0.4 ±         2.1         -10.1 ±         8.3         GA0112           WA4A         -9.1         25.1         0.6         5.0 ± ±         0.1         2.1 ±         -17.9 ±         7.5         GA0112           WA5A         1.6         91.6         0.5         -0.2 ±         0.1         -1.3 ±         1.2         -17.9 ±                                                                                                                                     | FD3        | 22.9        | 224.5       | 1.2       | -0.2 ± 0.1     | -0.9± 1.5           | -15.5 ± 9.1     | GA01113 |
| FD5         9.1         368.5         1.0         1.0±         1.6         -0.5±         1.7         -13.4±         9.7         GA0111           FD6         -9.1         302.0         1.0         -0.2±         0.1         -0.1±         1.9         -19.1±         7.8         GA0111           WA1A         33.6         58.3         0.6         -0.2±         0.1         0.8±         2.2         -18.4±         9.1         GA0111           WA2A         1.6         -30.3         0.5         1.0±         1.6         0.4±         2.1         -21.1±         8.4         GA0111           WA2A         1.6         169.1         0.8         -0.2±         0.1         0.4±         2.1         -21.1±         8.4         GA0112           WA3A         1.6         191.6         0.5         -0.2±         0.1         0.4±         2.1         -20.4±         8.1         GA0112           WA5A         1.6         91.6         0.5         -0.2±         0.1         1.3±         1.2         -17.9±         7.5         GA0112           WA4B         -9.1         58.3         0.8         -0.2±         0.1         -0.5±         1.7         -15.1±                                                                                                                                                   | FD4        | 1.6         | 457.1       | 1.1       | 0.4 ± 1.1      | -0.9± 1.5           | -16.9 ± 8.5     | GA01114 |
| FD6         .9.1         .302.0         1.0         -0.2 ±         0.1         0.1 ±         1.9         -19.1 ±         7.8         GA0111           WA1A         33.6         58.3         0.6         -0.2 ±         0.1         0.8 ±         2.2         -18.4 ±         9.1         GA0111           WA2A         1.6         -30.3         0.5         1.0 ±         1.6         0.4 ±         2.1         -21.1 ±         8.4         GA0111           WA3A         1.6         169.1         0.8         -0.2 ±         0.1         0.4 ±         2.1         -10.1 ±         8.3         GA0111           WA3A         1.6         169.1         0.8         -0.2 ±         0.1         0.4 ±         2.1         -10.1 ±         8.3         GA0112           WA4A         -9.1         25.1         0.6         5.0 ±         3.4         3.3 ±         3.0         -20.4 ±         8.1         GA0112           WA5A         1.6         91.6         0.5         -0.2 ±         0.1         -3.3 ±         3.0         -20.2 ±         8.1         GA0112           WA2B         1.6         146.9         0.7         -0.2 ±         0.1         -0.9 ±         1.5                                                                                                                                          | FD5        | -9.1        | 368.5       | 1.0       | 1.0 ± 1.6      | -0.5 ± 1.7          | -13.4 ± 9.7     | GA01115 |
| WA1A         33.6         58.3         0.6         -0.2 ±         0.1         0.8 ±         2.2         -18.4 ±         9.1         GA0111           WA2A         1.6         -30.3         0.5         1.0 ±         1.6         0.4 ±         2.1         -21.1 ±         8.4         GA0111           WA3A         1.6         169.1         0.8         -0.2 ±         0.1         0.4 ±         2.1         -10.1 ±         8.3         GA0111           WA3A         1.6         169.1         0.8         -0.2 ±         0.1         0.4 ±         2.1         -10.1 ±         8.3         GA0112           WA4A         -9.1         25.1         0.6         5.0 ±         3.4         3.3 ±         3.0         -20.4 ±         8.1         GA0112           WA5A         1.6         91.6         0.5         -0.2 ±         0.1         -1.3 ±         1.2         -17.9 ±         7.5         GA0112           WA5A         1.6         146.9         0.7         -0.2 ±         0.1         -0.9 ±         1.5         -20.5 ±         8.4         GA0112           WA2B         1.6         146.9         0.7         -0.2 ±         0.1         -0.5 ±         1.7                                                                                                                                          | FD6        | -9.1        | 302.0       | 1.0       | -0.2 ± 0.1     | -0.1 ± 1.9          | -19.1 ± 7.8     | GA01116 |
| WA2A1.6-30.30.51.0 $\pm$ 1.60.4 $\pm$ 2.1-21.1 $\pm$ 8.4GA0111WA3A1.6169.10.8-0.2 $\pm$ 0.10.4 $\pm$ 2.1-10.1 $\pm$ 8.3GA0111WA4A-9.125.10.65.0 $\pm$ 3.43.3 $\pm$ 3.0-20.4 $\pm$ 8.1GA0112WA5A1.691.60.5-0.2 $\pm$ 0.12.0 $\pm$ 2.6-13.7 $\pm$ 7.9GA0112WA6A-9.13.00.6-0.2 $\pm$ 0.1-1.3 $\pm$ 1.2-17.9 $\pm$ 7.5GA0112WA6A-9.158.30.8-0.2 $\pm$ 0.1-1.3 $\pm$ 1.2-17.9 $\pm$ 7.5GA0112WA1B-9.158.30.8-0.2 $\pm$ 0.1-0.9 $\pm$ 1.5-20.5 $\pm$ 8.4GA0112WA2B1.6146.90.7-0.2 $\pm$ 0.1-0.9 $\pm$ 1.5-20.5 $\pm$ 8.4GA0112WA3B1.6357.40.8-0.2 $\pm$ 0.1-0.9 $\pm$ 1.5-12.2 $\pm$ 8.0GA0112WA4B-9.1224.50.6-0.2 $\pm$ 0.1-0.9 $\pm$ 1.5-12.2 $\pm$ 8.0GA0112WA5B-9.136.20.4-0.2 $\pm$ 0.1-0.5 $\pm$ 1.7-15.1 $\pm$ 7.7GA0112WA6B1.6146.90.3-0.2 $\pm$ 0.1-0.5 $\pm$ 1.7-17.9 $\pm$ 7.7GA0112WA6B1.6146.90.3-0.2 $\pm$ 0.1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | WAIA       | 33.6        | 58.3        | 0.6       | -0.2 ± 0.1     | 0.8 ± 2.2           | -18.4 ± 9.1     | GA01117 |
| WA3A       1.6       169,1       0.8       -0.2 ± 0.1       0.4 ± 2.1       -10.1 ± 8.3       GA0111         WA4A       -9.1       25.1       0.6       5.0 ± 3.4       3.3 ± 3.0       -20.4 ± 8.1       GA0112         WA5A       1.6       91.6       0.5       -0.2 ± 0.1       2.0 ± 2.6       -13.7 ± 7.9       GA0112         WA6A       -9.1       3.0       0.6       -0.2 ± 0.1       -1.3 ± 1.2       -17.9 ± 7.5       GA0112         WA6A       -9.1       3.0       0.6       -0.2 ± 0.1       -1.3 ± 1.2       -17.9 ± 7.5       GA0112         WA1B       -9.1       58.3       0.8       -0.2 ± 0.1       -0.9 ± 1.5       -20.5 ± 8.4       GA0112         WA2B       1.6       146.9       0.7       -0.2 ± 0.1       -0.9 ± 1.5       -20.5 ± 8.4       GA0112         WA3B       1.6       357.4       0.8       -0.2 ± 0.1       -0.9 ± 1.5       -12.2 ± 8.0       GA0112         WA4B       -9.1       224.5       0.6       -0.2 ± 0.1       -0.5 ± 1.7       -15.1 ± 7.9       GA0112         WA4B       -9.1       224.5       0.6       -0.2 ± 0.1       -0.5 ± 1.7       -17.9 ± 7.7       GA0112         WA5B       1.6                                                                                                                                                                       | WA2A       | 1.6         | -30.3       | 0.5       | 1.0 ± 1.6      | 0.4 ± 2.1           | -21.1 ± 8.4     | GA01118 |
| WA4A         -9.1         25.1         0.6         5.0 ±         3.4         3.3 ±         3.0         -20.4 ±         8.1         GA0112           WA5A         1.6         91.6         0.5         -0.2 ±         0.1         2.0 ±         2.6         -13.7 ±         7.9         GA0112           WA6A         -9.1         3.0         0.6         -0.2 ±         0.1         -1.3 ±         1.2         -17.9 ±         7.5         GA0112           WA6A         -9.1         58.3         0.8         -0.2 ±         0.1         -3.3 ±         3.0         -20.2 ±         8.1         GA0112           WA1B         -9.1         58.3         0.8         -0.2 ±         0.1         -0.9 ±         1.5         -20.5 ±         8.4         GA0112           WA2B         1.6         146.9         0.7         -0.2 ±         0.1         -0.5 ±         1.7         -15.1 ±         7.9         GA0112           WA4B         -9.1         224.5         0.6         -0.2 ±         0.1         -0.5 ±         1.7         -17.9 ±         7.7         GA0112           WA5B         -9.1         36.2         0.4         -0.2 ±         0.1         -0.5 ±         1.7                                                                                                                                      | WA3A       | 1.6         | 169.1       | 0.8       | -0.2 ± 0.1     | 0.4 ± 2.1           | -10.1 ± 8.3     | GA01119 |
| WA5A         1.6         91.6         0.5         -0.2 ±         0.1         2.0 ±         2.6         -13.7 ±         7.9         GA0112           WA6A         -9.1         3.0         0.6         -0.2 ±         0.1         -1.3 ±         1.2         -17.9 ±         7.5         GA0112           WA1B         -9.1         58.3         0.8         -0.2 ±         0.1         3.3 ±         3.0         -20.2 ±         8.1         GA0112           WA2B         1.6         146.9         0.7         -0.2 ±         0.1         -0.9 ±         1.5         -20.5 ±         8.4         GA0112           WA3B         1.6         357.4         0.8         -0.2 ±         0.1         -0.9 ±         1.5         -20.5 ±         8.4         GA0112           WA4B         -9.1         224.5         0.6         -0.2 ±         0.1         -0.5 ±         1.7         -15.1 ±         7.9         GA0112           WA5B         -9.1         36.2         0.4         -0.2 ±         0.1         -0.5 ±         1.7         -17.9 ±         7.7         GA0112           WA6B         1.6         146.9         0.3         -0.2 ±         0.1         -0.5 ±         1.7                                                                                                                                     | WA4A       | -9.1        | 25.1        | 0.6       | 5.0 ± 3.4      | 3.3 ± 3.0           | -20.4 ± 8.1     | GA01120 |
| WA6A         -9.1         3.0         0.6         -0.2 ±         0.1         -1.3 ±         1.2         -17.9 ±         7.5         GA0112           WA1B         -9.1         58.3         0.8         -0.2 ±         0.1         3.3 ±         3.0         -20.2 ±         8.1         GA0112           WA2B         1.6         146.9         0.7         -0.2 ±         0.1         -0.9 ±         1.5         -20.5 ±         8.4         GA0112           WA3B         1.6         357.4         0.8         -0.2 ±         0.1         -0.9 ±         1.5         -20.5 ±         8.4         GA0112           WA3B         1.6         357.4         0.8         -0.2 ±         0.1         -0.5 ±         1.7         -15.1 ±         7.9         GA0112           WA4B         -9.1         224.5         0.6         -0.2 ±         0.1         -0.9 ±         1.5         -12.2 ±         8.0         GA0112           WA6B         1.6         146.9         0.3         -0.2 ±         0.1         -0.5 ±         1.7         -17.9 ±         7.7         GA0112           WA6B         1.6         146.9         0.3         -0.2 ±         0.1         0.8 ±         2.2 <td>WA5A</td> <td>1.6</td> <td>91.6</td> <td>0.5</td> <td>-0.2 ± 0.1</td> <td>2.0 ± 2.6</td> <td>-13.7 ± 7.9</td> <td>GA01121</td> | WA5A       | 1.6         | 91.6        | 0.5       | -0.2 ± 0.1     | 2.0 ± 2.6           | -13.7 ± 7.9     | GA01121 |
| WA1B-9.158.30.8 $-0.2 \pm 0.1$ $3.3 \pm 3.0$ $-20.2 \pm 8.1$ GA0112WA2B1.6146.90.7 $-0.2 \pm 0.1$ $-0.9 \pm 1.5$ $-20.5 \pm 8.4$ GA0112WA3B1.6357.40.8 $-0.2 \pm 0.1$ $-0.9 \pm 1.5$ $-15.1 \pm 7.9$ GA0112WA4B $-9.1$ 224.50.6 $-0.2 \pm 0.1$ $-0.9 \pm 1.5$ $-12.2 \pm 8.0$ GA0112WA4B $-9.1$ 224.50.6 $-0.2 \pm 0.1$ $-0.9 \pm 1.5$ $-12.2 \pm 8.0$ GA0112WA5B $-9.1$ 36.20.4 $-0.2 \pm 0.1$ $1.6 \pm 2.5$ $-16.5 \pm 7.7$ GA0112WA6B1.6146.90.3 $-0.2 \pm 0.1$ $-0.5 \pm 1.7$ $-17.9 \pm 7.7$ GA0112WA6B1.6146.90.3 $-0.2 \pm 0.1$ $0.8 \pm 2.2$ $-18.2 \pm 7.4$ GA0112WB1A $-9.1$ 213.40.1 $-0.2 \pm 0.1$ $0.8 \pm 2.2$ $-18.2 \pm 7.4$ GA0113WB2A1.6246.60.3 $1.0 \pm 1.6$ $0.4 \pm 2.1$ $-15.0 \pm 8.0$ GA0113WB3A $-9.1$ 291.00.6 $-0.2 \pm 0.1$ $-0.1 \pm 1.9$ $-12.6 \pm 8.1$ GA0113WB4A $-9.1$ 113.70.7 $-0.2 \pm 0.1$ $0.4 \pm 2.1$ $-15.3 \pm 7.9$ GA0113WB2B12.3346.30.6 $0.4 \pm 1.1$ $0.8 \pm 2.2$ $-9.3 \pm 8.4$ GA0113WB3B1.6512.5 $0.8$ $-0.2 \pm 0.1$ $-0.5 \pm 1.7$ $-14.4 \pm 7.8$ GA0113WB3B1.6512.5 $0.8$ $-0.2 \pm 0.1$ <td< td=""><td>WA6A</td><td>-9.1</td><td>3.0</td><td>0.6</td><td>-0.2 ± 0.1</td><td>-1.3 ± 1.2</td><td>-17.9 ± 7.5</td><td>GA01122</td></td<>                                                                                                                              | WA6A       | -9.1        | 3.0         | 0.6       | -0.2 ± 0.1     | -1.3 ± 1.2          | -17.9 ± 7.5     | GA01122 |
| WA2B       1.6       146.9       0.7       -0.2 ±       0.1       -0.9 ±       1.5       -20.5 ±       8.4       GA0112         WA3B       1.6       357.4       0.8       -0.2 ±       0.1       -0.5 ±       1.7       -15.1 ±       7.9       GA0112         WA4B       -9.1       224.5       0.6       -0.2 ±       0.1       -0.9 ±       1.5       -12.2 ±       8.0       GA0112         WA5B       -9.1       36.2       0.4       -0.2 ±       0.1       1.6 ±       2.5       -16.5 ±       7.7       GA0112         WA5B       -9.1       36.2       0.4       -0.2 ±       0.1       1.6 ±       2.5       -16.5 ±       7.7       GA0112         WA6B       1.6       146.9       0.3       -0.2 ±       0.1       -0.5 ±       1.7       -17.9 ±       7.7       GA0112         WA6B       1.6       246.6       0.3       1.0 ±       1.6       0.4 ±       2.1       -15.0 ±       8.0       GA0113         WB2A       1.6       246.6       0.3       1.0 ±       1.6       0.4 ±       2.1       -15.0 ±       8.1       GA0113         WB3A       -9.1       291.0       0.6 <td>WA1B</td> <td>-9.1</td> <td>58.3</td> <td>0.8</td> <td>-0.2 ± 0.1</td> <td>3.3 ± 3.0</td> <td>-20.2 ± 8.1</td> <td>GA01123</td>                                                                                        | WA1B       | -9.1        | 58.3        | 0.8       | -0.2 ± 0.1     | 3.3 ± 3.0           | -20.2 ± 8.1     | GA01123 |
| WA3B1.6 $357.4$ $0.8$ $-0.2 \pm 0.1$ $-0.5 \pm 1.7$ $-15.1 \pm 7.9$ GA0112WA4B $-9.1$ $224.5$ $0.6$ $-0.2 \pm 0.1$ $-0.9 \pm 1.5$ $-12.2 \pm 8.0$ GA0112WA5B $-9.1$ $36.2$ $0.4$ $-0.2 \pm 0.1$ $1.6 \pm 2.5$ $-16.5 \pm 7.7$ GA0112WA6B $1.6$ $146.9$ $0.3$ $-0.2 \pm 0.1$ $1.6 \pm 2.5$ $-16.5 \pm 7.7$ GA0112WA6B $1.6$ $146.9$ $0.3$ $-0.2 \pm 0.1$ $-0.5 \pm 1.7$ $-17.9 \pm 7.7$ GA0112WB1A $-9.1$ $213.4$ $0.1$ $-0.2 \pm 0.1$ $0.8 \pm 2.2$ $-18.2 \pm 7.4$ GA0112WB2A $1.6$ $246.6$ $0.3$ $1.0 \pm 1.6$ $0.4 \pm 2.1$ $-15.0 \pm 8.0$ GA0113WB3A $-9.1$ $291.0$ $0.6$ $-0.2 \pm 0.1$ $-0.1 \pm 1.9$ $-12.6 \pm 8.1$ GA0113WB4A $-9.1$ $113.7$ $0.7$ $-0.2 \pm 0.1$ $0.4 \pm 2.1$ $-15.3 \pm 7.9$ GA0113WB4A $-9.1$ $246.6$ $0.8$ $-0.2 \pm 0.1$ $0.4 \pm 2.1$ $-15.3 \pm 7.9$ GA0113WB1B $-9.1$ $246.6$ $0.8$ $-0.2 \pm 0.1$ $0.4 \pm 2.1$ $-15.3 \pm 7.9$ GA0113WB2B $12.3$ $346.3$ $0.6$ $0.4 \pm 1.1$ $0.8 \pm 2.2$ $-9.3 \pm 8.4$ GA0113WB3B $1.6$ $512.5$ $0.8$ $-0.2 \pm 0.1$ $0.4 \pm 2.1$ $-18.0 \pm 7.6$ GA0113WB4B $12.3$ $47.3$ $1.0$ $-0.2 \pm 0.1$ $-0.9 \pm 1.5$ $-17.9 \pm 7.6$ GA0113WC1A </td <td>WA2B</td> <td>1.6</td> <td>146.9</td> <td>0.7</td> <td>-0.2 ± 0.1</td> <td>-0.9 ± 1.5</td> <td>-20.5 ± 8.4</td> <td>GA01124</td>                                                                | WA2B       | 1.6         | 146.9       | 0.7       | -0.2 ± 0.1     | -0.9 ± 1.5          | -20.5 ± 8.4     | GA01124 |
| WA4B-9.1224.50.6 $-0.2 \pm 0.1$ $-0.9 \pm 1.5$ $-12.2 \pm 8.0$ GA0112WA5B-9.136.20.4 $-0.2 \pm 0.1$ $1.6 \pm 2.5$ $-16.5 \pm 7.7$ GA0112WA6B1.6146.90.3 $-0.2 \pm 0.1$ $-0.5 \pm 1.7$ $-17.9 \pm 7.7$ GA0112WB1A-9.1213.40.1 $-0.2 \pm 0.1$ $0.8 \pm 2.2$ $-18.2 \pm 7.4$ GA0112WB2A1.6246.60.3 $1.0 \pm 1.6$ $0.4 \pm 2.1$ $-15.0 \pm 8.0$ GA0113WB3A-9.1291.00.6 $-0.2 \pm 0.1$ $0.4 \pm 2.1$ $-15.0 \pm 8.0$ GA0113WB4A-9.1113.70.7 $-0.2 \pm 0.1$ $0.4 \pm 2.1$ $-15.3 \pm 7.9$ GA0113WB4B12.3346.30.6 $0.4 \pm 1.1$ $0.8 \pm 2.2$ $-9.3 \pm 8.4$ GA0113WB3B1.6512.5 $0.8$ $-0.2 \pm 0.1$ $-0.5 \pm 1.7$ $-14.4 \pm 7.8$ GA0113WB4B12.347.3 $1.0$ $-0.2 \pm 0.1$ $0.4 \pm 2.1$ $-18.0 \pm 7.6$ GA0113WC1A1.6446.0 $1.1$ $-0.2 \pm 0.1$ $-0.9 \pm 1.5$ $-17.9 \pm 7.6$ GA0113WC1A1.6446.0 $1.1$ $-0.2 \pm 0.1$ $-0.5 \pm 1.7$ $-18.8 \pm 7.8$ GA0113                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | WA3B       | 1.6         | 357.4       | 0.8       | -0.2 ± 0.1     | -0.5 ± 1.7          | -15.1 ± 7.9     | GA01125 |
| WA5B-9.1 $36.2$ $0.4$ $-0.2 \pm 0.1$ $1.6 \pm 2.5$ $-16.5 \pm 7.7$ GA0112WA6B1.6146.9 $0.3$ $-0.2 \pm 0.1$ $-0.5 \pm 1.7$ $-17.9 \pm 7.7$ GA0112WB1A-9.1213.4 $0.1$ $-0.2 \pm 0.1$ $0.8 \pm 2.2$ $-18.2 \pm 7.4$ GA0112WB2A1.6246.6 $0.3$ $1.0 \pm 1.6$ $0.4 \pm 2.1$ $-15.0 \pm 8.0$ GA0113WB3A-9.1291.0 $0.6$ $-0.2 \pm 0.1$ $-0.1 \pm 1.9$ $-12.6 \pm 8.1$ GA0113WB4A-9.1113.7 $0.7$ $-0.2 \pm 0.1$ $0.4 \pm 2.1$ $-15.3 \pm 7.9$ GA0113WB1B-9.1246.6 $0.8$ $-0.2 \pm 0.1$ $0.4 \pm 2.1$ $-15.3 \pm 7.9$ GA0113WB2B12.3346.3 $0.6$ $0.4 \pm 1.1$ $0.8 \pm 2.2$ $-9.3 \pm 8.4$ GA0113WB3B1.6512.5 $0.8$ $-0.2 \pm 0.1$ $0.4 \pm 2.1$ $-18.0 \pm 7.6$ GA0113WB4B12.347.3 $1.0$ $-0.2 \pm 0.1$ $0.4 \pm 2.1$ $-18.0 \pm 7.6$ GA0113WC1A1.6446.0 $1.1$ $-0.2 \pm 0.1$ $-0.9 \pm 1.5$ $-17.9 \pm 7.6$ GA0113                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | WA4B       | -9.1        | 224.5       | 0.6       | -0.2 ± 0.1     | -0.9 ± 1.5          | -12.2 ± 8.0     | GA01126 |
| WA6B1.6146.9 $0.3$ $-0.2 \pm 0.1$ $-0.5 \pm 1.7$ $-17.9 \pm 7.7$ GA0112WB1A-9.1213.4 $0.1$ $-0.2 \pm 0.1$ $0.8 \pm 2.2$ $-18.2 \pm 7.4$ GA0112WB2A1.6246.6 $0.3$ $1.0 \pm 1.6$ $0.4 \pm 2.1$ $-15.0 \pm 8.0$ GA0113WB3A-9.1291.0 $0.6$ $-0.2 \pm 0.1$ $-0.1 \pm 1.9$ $-12.6 \pm 8.1$ GA0113WB4A-9.1113.7 $0.7$ $-0.2 \pm 0.1$ $0.4 \pm 2.1$ $-15.3 \pm 7.9$ GA0113WB4B-9.1246.6 $0.8$ $-0.2 \pm 0.1$ $0.4 \pm 2.1$ $-15.3 \pm 7.9$ GA0113WB2B12.3346.3 $0.6$ $0.4 \pm 1.1$ $0.8 \pm 2.2$ $-9.3 \pm 8.4$ GA0113WB3B1.6512.5 $0.8$ $-0.2 \pm 0.1$ $0.4 \pm 2.1$ $-18.0 \pm 7.6$ GA0113WB4B12.347.3 $1.0$ $-0.2 \pm 0.1$ $0.4 \pm 2.1$ $-18.0 \pm 7.6$ GA0113WC1A1.6446.0 $1.1$ $-0.2 \pm 0.1$ $-0.9 \pm 1.5$ $-17.9 \pm 7.6$ GA0113                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | WA5B       | -9.1        | 36.2        | 0.4       | -0.2 ± 0.1     | 1.6 ± 2.5           | -16.5 ± 7.7     | GA01127 |
| WB1A-9.1213.40.1 $-0.2 \pm 0.1$ $0.8 \pm 2.2$ $-18.2 \pm 7.4$ GA0112WB2A1.6246.60.3 $1.0 \pm 1.6$ $0.4 \pm 2.1$ $-15.0 \pm 8.0$ GA0113WB3A-9.1291.00.6 $-0.2 \pm 0.1$ $-0.1 \pm 1.9$ $-12.6 \pm 8.1$ GA0113WB4A-9.1113.70.7 $-0.2 \pm 0.1$ $0.4 \pm 2.1$ $-15.3 \pm 7.9$ GA0113WB1B-9.1246.60.8 $-0.2 \pm 0.1$ $0.4 \pm 2.1$ $-15.3 \pm 7.9$ GA0113WB2B12.3346.30.6 $0.4 \pm 1.1$ $0.8 \pm 2.2$ $-9.3 \pm 8.4$ GA0113WB3B1.6512.5 $0.8$ $-0.2 \pm 0.1$ $0.4 \pm 2.1$ $-18.0 \pm 7.6$ GA0113WB4B12.347.3 $1.0$ $-0.2 \pm 0.1$ $-0.9 \pm 1.5$ $-17.9 \pm 7.6$ GA0113WC1A1.6446.0 $1.1$ $-0.2 \pm 0.1$ $-0.5 \pm 1.7$ $-18.8 \pm 7.8$ GA0113                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | WA6B       | 1.6         | 146.9       | 0.3       | -0.2 ± 0.1     | -0.5 ± 1.7          | -17.9 ± 7.7     | GA01128 |
| WB2A1.6246.60.3 $1.0 \pm 1.6$ $0.4 \pm 2.1$ $-15.0 \pm 8.0$ GA0113WB3A-9.1291.00.6 $-0.2 \pm 0.1$ $-0.1 \pm 1.9$ $-12.6 \pm 8.1$ GA0113WB4A-9.1113.70.7 $-0.2 \pm 0.1$ $0.4 \pm 2.1$ $-15.3 \pm 7.9$ GA0113WB1B-9.1246.60.8 $-0.2 \pm 0.1$ $0.4 \pm 2.1$ $-15.3 \pm 7.9$ GA0113WB2B12.3346.30.6 $0.4 \pm 1.1$ $0.8 \pm 2.2$ $-9.3 \pm 8.4$ GA0113WB3B1.6512.50.8 $-0.2 \pm 0.1$ $0.4 \pm 2.1$ $-18.0 \pm 7.6$ GA0113WB4B12.347.31.0 $-0.2 \pm 0.1$ $0.4 \pm 2.1$ $-18.0 \pm 7.6$ GA0113WC1A1.6446.01.1 $-0.2 \pm 0.1$ $-0.9 \pm 1.5$ $-17.9 \pm 7.6$ GA0113                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | WB1A       | -9.1        | 213.4       | 0.1       | -0.2 ± 0.1     | 0.8 ± 2.2           | -18.2 ± 7.4     | GA01129 |
| WB3A-9.1291.00.6 $-0.2 \pm 0.1$ $-0.1 \pm 1.9$ $-12.6 \pm 8.1$ GA0113WB4A-9.1113.70.7 $-0.2 \pm 0.1$ $0.4 \pm 2.1$ $-15.3 \pm 7.9$ GA0113WB1B-9.1246.60.8 $-0.2 \pm 0.1$ $-0.5 \pm 1.7$ $-14.4 \pm 7.8$ GA0113WB2B12.3346.30.6 $0.4 \pm 1.1$ $0.8 \pm 2.2$ $-9.3 \pm 8.4$ GA0113WB3B1.6512.5 $0.8$ $-0.2 \pm 0.1$ $0.4 \pm 2.1$ $-18.0 \pm 7.6$ GA0113WB4B12.347.3 $1.0$ $-0.2 \pm 0.1$ $-0.9 \pm 1.5$ $-17.9 \pm 7.6$ GA0113WC1A1.6446.0 $1.1$ $-0.2 \pm 0.1$ $-0.5 \pm 1.7$ $-18.8 \pm 7.8$ GA0113                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | WB2A       | 1.6         | 246.6       | 0.3       | 1.0 ± 1.6      | 0.4 ± 2.1           | -15.0 ± 8.0     | GA01130 |
| WB4A-9.1113.70.7 $-0.2 \pm 0.1$ $0.4 \pm 2.1$ $-15.3 \pm 7.9$ GA0113WB1B-9.1246.60.8 $-0.2 \pm 0.1$ $-0.5 \pm 1.7$ $-14.4 \pm 7.8$ GA0113WB2B12.3346.30.6 $0.4 \pm 1.1$ $0.8 \pm 2.2$ $-9.3 \pm 8.4$ GA0113WB3B1.6512.50.8 $-0.2 \pm 0.1$ $0.4 \pm 2.1$ $-18.0 \pm 7.6$ GA0113WB4B12.347.31.0 $-0.2 \pm 0.1$ $0.4 \pm 2.1$ $-18.0 \pm 7.6$ GA0113WC1A1.6446.01.1 $-0.2 \pm 0.1$ $-0.9 \pm 1.5$ $-17.9 \pm 7.6$ GA0113                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | WB3A       | -9.1        | 291.0       | 0.6       | -0.2 ± 0.1     | -0.1 ± 1.9          | -12.6 ± 8.1     | GA01131 |
| WB1B-9.1246.60.8 $-0.2 \pm 0.1$ $-0.5 \pm 1.7$ $-14.4 \pm 7.8$ GA0113WB2B12.3346.30.6 $0.4 \pm 1.1$ $0.8 \pm 2.2$ $-9.3 \pm 8.4$ GA0113WB3B1.6512.5 $0.8$ $-0.2 \pm 0.1$ $0.4 \pm 2.1$ $-18.0 \pm 7.6$ GA0113WB4B12.347.3 $1.0$ $-0.2 \pm 0.1$ $-0.9 \pm 1.5$ $-17.9 \pm 7.6$ GA0113WC1A1.6446.0 $1.1$ $-0.2 \pm 0.1$ $-0.5 \pm 1.7$ $-18.8 \pm 7.8$ GA0113                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | WB4A       | -9.1        | 113.7       | 0.7       | -0.2 ± 0.1     | 0.4 ± 2.1           | -15.3 ± 7.9     | GA01132 |
| WB2B         12.3         346.3         0.6         0.4 ±         1.1         0.8 ±         2.2         -9.3 ±         8.4         GA0113           WB3B         1.6         512.5         0.8         -0.2 ±         0.1         0.4 ±         2.1         -18.0 ±         7.6         GA0113           WB4B         12.3         47.3         1.0         -0.2 ±         0.1         -0.9 ±         1.5         -17.9 ±         7.6         GA0113           WC1A         1.6         446.0         1.1         -0.2 ±         0.1         -0.5 ±         1.7         -18.8 ±         7.8         GA0113                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | WB1B       | -9.1        | 246.6       | 0.8       | -0.2 ± 0.1     | -0.5 ± 1.7          | -14.4 ± 7.8     | GA01133 |
| WB3B         1.6         512.5 $0.8$ $-0.2 \pm 0.1$ $0.4 \pm 2.1$ $-18.0 \pm 7.6$ GA0113           WB4B         12.3         47.3         1.0 $-0.2 \pm 0.1$ $-0.9 \pm 1.5$ $-17.9 \pm 7.6$ GA0113           WC1A         1.6         446.0         1.1 $-0.2 \pm 0.1$ $-0.5 \pm 1.7$ $-18.8 \pm 7.8$ GA0113                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | WB2B       | 12.3        | 346.3       | 0.6       | 0.4 ± 1.1      | 0.8 ± 2.2           | -9.3 ± 8.4      | GA01134 |
| WB4B         12.3         47.3         1.0         -0.2 ±         0.1         -0.9 ±         1.5         -17.9 ±         7.6         GA0113           WC1A         1.6         446.0         1.1         -0.2 ±         0.1         -0.5 ±         1.7         -18.8 ±         7.8         GA0113                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | WB3B       | 1.6         | 512.5       | 0.8       | -0.2 ± 0.1     | 0.4 ± 2.1           | -18.0 ± 7.6     | GA01135 |
| WC1A 1.6 446.0 1.1 -0.2 ± 0.1 -0.5 ± 1.7 -18.8 ± 7.8 GA0113                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | WB4B       | 12.3        | 47.3        | 1.0       | -0.2 ± 0.1     | -0.9 ± 1.5          | -17.9 ± 7.6     | GA01136 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | WC1A       | 1.6         | 446.0       | 1.1       | -0.2 ± 0.1     | -0.5 ± 1.7          | -18.8 ± 7.8     | GA01137 |
| 104 ± 2.1   1.6   3/9.6   1.2   1.0 ± 1.6   0.4 ± 2.1   -13.3 ± 8.4 IGA0113                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | WC2A       | 1.6         | 379.6       | 1.2       | 1.0 ± 1.6      | 0.4 ± 2.1           | -13.3 ± 8.4     | GA01138 |
| WC3A -9.1 25.1 1.3 0.4 ± 1.1 2.5 ± 2.8 -13.4 ± 8.4 GA0113                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | WC3A       | -9.1        | 25.1        | 1.3       | 0.4 ± 1.1      | 2.5 ± 2.8           | -13.4 ± 8.4     | GA01139 |
| WC4A 12.3 512.5 1.2 -0.2 ± 0.1 2.0 ± 2.6 -20.1 ± 7.6 GA0114                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | WC4A       | 12.3        | 512.5       | 1.2       | -0.2 ± 0.1     | 2.0 ± 2.6           | -20.1 ± 7.6     | GA01140 |
| WC5A 12.3 135.9 1.4 -0.2 ± 0.1 -0.1 ± 1.9 -13.0 ± 8.5 GA0114                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | WC5A       | 12.3        | 135.9       | 1.4       | -0.2 ± 0.1     | -0.1 ± 1.9          | -13.0 ± 8.5     | GA01141 |
| WC6A 1.6 91.6 1.4 1.0 ± 1.6 1.6 ± 2.5 -13.5 ± 8.5 GA0114                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | WC6A       | 1.6         | 91.6        | 1.4       | 1.0 ± 1.6      | 1.6 ± 2.5           | -13.5 ± 8.5     | GA01142 |

| C- | 16 | - | 1 |
|----|----|---|---|
|----|----|---|---|




|            |             | Fo          | rt Meade,  | Building 2805 | (Room 2)            |                 |         |
|------------|-------------|-------------|------------|---------------|---------------------|-----------------|---------|
| Location   | 1           | Monitoring  |            |               | Wipe Test           |                 |         |
| Code       | Alpha       | Beta        | Gamma      | Alpha         | Beta                | LS              | Wipe    |
| (Units =>) | dpm/100cm^2 | dpm/100cm^2 | uR/hr      | dpi           | m/100cm^2 +/- 2 sig | ma              | Number  |
| (Bkgd =>)  | 1.7         | 149.47      | 5.00       | 0.0           | 1.7                 | 27.1            |         |
| (MDA =>)   | 54          | 401 ·       | <b>-</b> · | 2.1           | 2.4                 | 32.2            |         |
| FA1        | 1.6         | 124.8       | -1.2       | 0.0 ± 0.0     | 0.1 ± 2.5           | -17.4 ± 9.3     | GA01044 |
| FA2        | 1.6         | 545.7       | -1.0       | 0.0 ± 0.0     | -0.4 ± 2.2          | -20.9 ± 9.0     | GA01045 |
| FA3        | -9.1        | 357.4       | -1.0       | 0.0 ± 0.0     | 1.8 ± 3.1           | -24.7 ± 8.7     | GA01046 |
| FA4        | 1.6         | 302.0       | -1.0       | 0.0 ± 0.0     | -1.0 ± 1.9          | -26.4 ± 8.5     | GA01047 |
| FB1        | 1.6         | 257.7       | -0.9       | $0.0 \pm 0.0$ | $0.7 \pm 2.7$       | -22.6 ± 8.9     | GA01048 |
| FB2        | 12.3        | 169.1       | -0.9       | $0.0 \pm 0.0$ | $-0.4 \pm 2.2$      | -22.6 ± 8.9     | GA01049 |
| OA         | N/A         | N/A         | N/A        | $0.0 \pm 0.0$ | $-1.5 \pm 1.6$      | $-20.0 \pm 8.9$ | GA01050 |
| FB3        | -9.1        | 390.6       | -0.9       | $0.0 \pm 0.0$ | 0.7 ± 2.7           | $-260 \pm 85$   | GA01051 |
| FB4        | 1.6         | 246.6       | -0.9       | $0.8 \pm 1.5$ | 12+ 29              | -221+ 89        | GA01052 |
| FC1        | -9.1        | 213.4       | -1.0       | $0.8 \pm 1.5$ | -10± 19             | -260+ 85        | GA01053 |
| FC2        | 1.6         | 36.2        | -0.9       | 1.6 ± 2.2     | $1.8 \pm 3.1$       | -20.9 + 9.0     | GA01054 |
| FC3        | 22.9        | 335.3       | -0.9       | $0.0 \pm 0.0$ | $-0.4 \pm 2.2$      | $-213 \pm 90$   | GA01055 |
| FC4        | 1.6         | 357.4       | -0.8       | $0.0 \pm 0.0$ | 1.8 ± 3.1           | $-23.0 \pm 9.1$ | GA01056 |
| FD1        | -9.1        | 36.2        | -0.6       | 0.0± 0.0      | $0.7 \pm 2.7$       | -22.6 ± 8.9     | GA01057 |
| FD2        | -9.1        | 468.2       | -0.6       | $1.6 \pm 2.2$ | -15± 16             | -183+ 92        | GA01058 |
| FD3        | -9.1        | 102.6       | -0.7       | $0.0 \pm 0.0$ | -04+ 22             | -233+ 86        | GA01059 |
| FD4        | 33.6        | 146.9       | -0.6       | 0.0 ± 0.0     | 0.1± 2.5            | -213+ 88        | GA01060 |
| WAIA       | 12.3        | 257.7       | -0.7       | $0.0 \pm 0.0$ | 12+ 29              | -191+ 92        | GA01061 |
| WAZA       | -9.1        | 25.1        | -0.8       | $0.0 \pm 0.0$ | 12+ 29              | -221+ 81        | GA01062 |
| WA3A       | 1.6         | 235.6       | -0.8       | $0.0 \pm 0.0$ | 18+ 31              | -196+ 84        | GA01063 |
| WAAA       | 22.9        | 224.5       | -0.9       | 0.0 + 0.0     | -04+ 22             | -213+ 84        | GA01064 |
| WA1B       | 1.6         | 412.8       | -0.8       | $0.0 \pm 0.0$ | $-1.0 \pm 1.9$      | -21.4 ± 9.7     | GA01065 |
| WA2B       | -9.1        | 335.3       | -1.0       | $0.0 \pm 0.0$ | 01+ 25              | -183 + 85       | GA01066 |
| WA3B       | -9.1        | 313.1       | -1.0       | $0.0 \pm 0.0$ | $-0.4 \pm 2.2$      | -146+ 88        | GA01067 |
| WAAR       | 33.6        | 58.3        | -1.1       | $0.0 \pm 0.0$ | -0.4 ± 2.2          | $-174 \pm 8.8$  | GA01068 |
| WB1A       | 1.6         | -41.3       | -0.9       | $0.0 \pm 0.0$ | $-2.0 \pm 1.2$      | -179 + 85       | GA01069 |
| WB2A       | 1.6         | 135.9       | -0.9       | 0.0 ± 0.0     | $2.3 \pm 3.3$       | -13.9 ± 8.7     | GA01070 |
| WB3A       | -9.1        | 25.1        | -0.9       | 0.8 ± 1.5     | 0.1 ± 2.5           | -17.4 ± 8.8     | GA01071 |
| WB4A       | 1.6         | 91.6        | -0.8       | $0.0 \pm 0.0$ | 0.7 ± 2.7           | -18.8 ± 8.4     | GA01072 |
| WB1B       | -9.1        | 3.0         | -0.9       | $0.0 \pm 0.0$ | -0.4 ± 2.2          | -226 ± 83       | GA01073 |
| WB2B       | -9.1        | 58.3        | -0.9       | $0.0 \pm 0.0$ | $12 \pm 29$         | -192 + 84       | GA01074 |
| WB3B       | 1.6         | 146.9       | -1.0       | $0.0 \pm 0.0$ | 0.7 ± 2.7           | $-20.4 \pm 8.5$ | GA01075 |
| WB4B       | 1.6         | 357.4       | -1.0       | 0.0 ± 0.0     | 1.2 ± 2.9           | $-23.5 \pm 8.4$ | GA01076 |
| WC1A       | -9.1        | 224.5       | -1.2       | 2.1 ± 2.3     | 0.8 ± 2.2           | -21.7 ± 8.6     | GA01077 |
| WC2A       | -9.1        | 36.2        | -1.3       | -0.2 ± 0.1    | -0.1 ± 1.9          | -20.4 ± 8.3     | GA01078 |
| WC3A       | 1.6         | 146.9       | -1.3       | 1.0 ± 1.6     | 0.4 ± 2.1           | -20.0 ± 8.3     | GA01079 |
| WC4A       | -9.1        | 213.4       | -1.1       | 1.0 ± 1.6     | 2.9 ± 2.9           | -15.4 ± 8.8     | GA01080 |
| WC1B       | 1.6         | 246.6       | -1.0       | 0.4 ± .1.1    | 0.4 ± 2.1           | -20.4 ± 8.5     | GA01081 |
| WC2B       | -9.1        | 291.0       | -1.2       | 0.4 ± 1.1     | 1.2 ± 2.4           | -17.4 ± 9.0     | GA01082 |
| WC3B       | -9.1        | 113.7       | -1.3       | 0.4 ± 1.1     | 0.4 ± 2.1           | -38.5 ± 14.4    | GA01083 |
| WC4B       | -9.1        | 246.6       | -1.1       | -0.2 ± 0.1    | -0.1 ± 1.9          | -22.3 ± 12.0    | GA01084 |
| WD1A       | 12.3        | 346.3       | -1.0       | 1.6 ± 2.0     | 0.8 ± 2.1           | -15.3 ± 7.8     | GA01085 |
| WD2A       | 1.6         | 512.5       | -1.0       | 2.1 ± 2.3     | 2.0 ± 2.6           | -14.6 ± 8.1     | GA01086 |
| WD3A       | 12.3        | 47.3        | -0.9       | -0.2 ± 0.1    | -0.5 ± 1.7          | -15.8 ± 7.7     | GA01087 |
| WD4A       | 1.6         | 446.0       | -1.1       | 0.4 ± 1.1     | -0.1 ± 1.9          | -12.9 ± 8.1     | GA01088 |
| WD1B       | 1.6         | 379.6       | -0.9       | -0.2 ± 0.1    | 0.8 ± 2.2           | -13.5 ± 77      | GA01089 |
| WD2B       | -9.1        | 25.1        | -1.1       | 1.6 ± 2.0     | -0.1 ± 1.9          | -16.9 ± 7.8     | GA01090 |
| WD3B       | 12.3        | 512.5       | -1.0       | 0.4 ± 1.1     | 1.6 ± 2.5           | -15.2 ± 7.8     | GA01091 |
| WDB4B      | 12.3        | 135.9       | -1.1       | 0.4 ± 1.1     | 1.2 ± 2.4           | -11.7 ± 8.2     | GA01092 |

C-15-1

|            |                                          | Fo          | rt Meade,      | Building 2805 | (Room 4)            |              |         |
|------------|------------------------------------------|-------------|----------------|---------------|---------------------|--------------|---------|
| Location   | an a | Monitoring  | • <sup>1</sup> | · · · · ·     | Wipe Test           |              |         |
| Code       | Aipha                                    | Beta        | Gamma          | Alpha         | Beta                | LS           | Wipe    |
| (Units =>) | dpm/100cm^2                              | dpm/100cm^2 | uR/hr          | dp            | m/100cm^2 +/- 2 sig | ma           | Number  |
| (Bkgd =>)  | 1.7                                      | 149.47      | 5.00           | 0.0           | 1.8                 | 26.3         |         |
| (MDA =>)   | 54                                       | 401         | · -            | 2.6           | . 2.8               | 29.2         |         |
| WD2A       | 9.1                                      | 357.4       | 0.1            | 0.0 ± 0.1     | -0.5 ± 2.3          | -11.7 ± 8.3  | GA01219 |
| WD3A       | -9.1                                     | 158.0       | -0.1           | 0.0 ± 0.1     | -3.0 ± 1.8          | -14.5 ± 8.0  | GA01220 |
| WD4A       | 1.6                                      | 80.5        | -0.1           | 0.0 ± 0.0     | -1.3 ± 1.7          | -12.9 ± 7.9  | GA01221 |
| WD1B       | 1.6                                      | 390.6       | 0.0            | -0.5± 0.3     | -0.8 ± 2.8          | -18.0 ± 7.9  | GA01222 |
| WD2B       | -9.1                                     | 191.3       | 0.1            | 0.0 ± 0.1     | -0.5 ± 2.3          | -16.6 ± 7.7  | GA01223 |
| WD3B       | -9.1                                     | 291.0       | 0.1            | 0.0 ± 0.1     | -0.1 ± 3.1          | -13.1 ± 8.2  | GA01224 |
| WD4B       | -9.1                                     | -96.7       | 0.0            | 0.0 ± 0.0     | 1.1 ± 2.9           | -17.2 ± 8.0  | GA01225 |
| RD1        | -9.1                                     | 434.9       | 0.5            | 0.3± 1.6      | -1.9 ± 2.3          | -18.7 ± 8.0  | GA01226 |
| RD2        | 1.6                                      | 158.0       | 0.5            | 0.0 ± 0.1     | -1.0 ± 2.0          | -19.6 ± 9.2  | GA01227 |
| RCNT3      | -9.1                                     | 158.0       | 0.0            | 0.0 ± 0.1     | -0.7 ± 2.9          | -22.4 ± 8.3  | GA01228 |
| RD4        | 1.6                                      | 446.0       | 0.1            | 0.0 ± 0.0     | -0.1 ± 2.4          | -16.6 ± 8.8  | GA01229 |
| RD5        | -9.1                                     | 257.7       | 0.0            | 1.1 ± 2.2     | -0.8 ± 2.8          | -17.5 ± 8.9  | GA01230 |
| RD6        | -9.1                                     | 180.2       | -0.3           | 0.0 ± 0.1     | 0.7 ± 2.8           | -24.8 ± 8.4  | GA01231 |
| RCNT7      | 1.6                                      | 235.6       | -0.3           | 0.0 ± 0.1     | -1.3 ± 2.7          | -18.6 ± 8.4  | GA01232 |
| RD8        | 1.6                                      | 180.2       | -0.3           | 0.0 ± 0.0     | 2.2 ± 3.3           | -16.0 ± 8.7  | GA01233 |
| RSNK9      | -9.1                                     | 169.1       | -0.4           | 1.1 ± 2.2     | 0.4 ± 3.2           | -16.7 ± 8.2  | GA01234 |
| RD10       | 1.6                                      | 291.0       | -0.4           | 0.0 ± 0.1     | 0.1 ± 2.5           | -15.9 ± 10.1 | GA01235 |
| RD11       | -9.1                                     | 302.0       | -0.3           | 0.7 ± 1.3     | 3.5 ± 4.2           | -22.1 ± 9.4  | GA01236 |
| RCNT12     | -9.1                                     | 246.6       | -0.2           | 0.0 ± 0.0     | -1.3 ± 1.7          | -22.7 ± 9.1  | GA01237 |
| RD13       | -9.1                                     | 324.2       | -0.1           | -0.5 ± 0.3    | 0.4 ± 3.2           | -15.2 ± 8.7  | GA01238 |
| RD14       | -9.1                                     | 202.3       | 0.6            | 0.0 ± 0.1     | 1.8 ± 3.2           | -18.1 ± 8.0  | GA01239 |
| RCNT15     | -9.1                                     | 146.9       | 1.0            | 0.0 ± 0.1     | -0.1 ± 3.1          | -14.5 ± 8.9  | GA01240 |
| QA         | N/A                                      | N/A         | N/A            | 0.0 ± 0.0     | 20.6 ± 7.3          | -16.8 ± 8.2  | GA01241 |

C-17-2

| 1.<br>1.1. |             | Fo          | rt Meade,                             | Building 2805 |                     |                                       |         |
|------------|-------------|-------------|---------------------------------------|---------------|---------------------|---------------------------------------|---------|
| Location   |             | Monitoring  |                                       |               | Wipe Test           | · · · · · · · · · · · · · · · · · · · | T       |
| Code       | Alpha       | Beta        | Gamma                                 | Alpha         | Beta                | LS                                    | Wipe    |
| (Units =>) | dpm/100cm^2 | dpm/100cm^2 | uR/hr                                 | dp            | m/100cm^2 +/- 2 sig | ma                                    | Number  |
| (Bkgd =>)  | 1.7         | 149.47      | 5.00                                  | 0.0           | 1.8                 | 26.3                                  |         |
| (MDA =>)   | 54          | 401         | -                                     | 2.6           | 2.8                 | 29.2                                  |         |
| FA1        | -9.1        | 246.6       | 1.0                                   | 0.4 ± 1.1     | -1.3 ± 1.2          | ✓ -17.6 ± 8.8                         | GA01169 |
| FA2        | 1.6         | 180.2       | 0.3                                   | -0.2 ± 0.1    | 1.6 ± 2.5           | -17.9 ± 8.3                           | GA01170 |
| FA3        | -9.1        | 313.1 .     | 0.1                                   | -0.2 ± 0.1    | 0.8 ± 2.2           | -19.8 ± 8.1                           | GA01171 |
| FA4        | 5.0         | 135.9       | 0.0                                   | 0.0 ± 0.1     | -0.7 ± 2.9          | -15.8 ± 8.2                           | GA01172 |
| FA5        | -9.1        | 80.5        | -0.1                                  | 0.0 ± 0.0     | -1.3 ± 1.7          | -14.4 ± 8.0                           | GA01173 |
| FB1        | -9.1        | 202.3       | -0.2                                  | 0.3 ± 1.6     | -1.9 ± 2.3          | -17.1 ± 7.6                           | GA01174 |
| FB2        | 33.6        | 180.2       | -0.2                                  | 0.0 ± 0.1     | 3.0 ± 3.6           | -12.5 ± 8.3                           | GA01175 |
| FB3        | 1.6         | 257.7       | -0.2                                  | 0.0 ± 0.1     | -1.3 ± 2.7          | -14.7 ± 7.9                           | GA01176 |
| FB4        | -9.1        | 268.8       | -0.1                                  | 0.0 ± 0.0     | 1.7 ± 3.1           | -16.7 ± 8.2                           | GA01177 |
| FB5        | -9.1        | 102.6       | 0.1                                   | -0.5 ± 0.3    | 0.9 ± 3.4           | -13.6 ± 8.7                           | GA01178 |
| FC1        | 1.6         | 146.9       | 0.3                                   | 0.0 ± 0.1     | 1.3 ± 3.0           | -18.0 ± 7.6                           | GA01179 |
| FC2        | 10.1        | 69.4        | 0.3                                   | 0.0 ± 0.1     | -0.7 ± 2.9          | -12.5 ± 8.3                           | GA01180 |
| FC3        | -9.1        | 158.0       | 0.3                                   | 0.0 ± 0.0     | 2.8 ± 3.5           | -15.9 ± 7.8                           | GA01181 |
| FC4        | -9.1        | 224.5       | 0.1                                   | 0.3 ± 1.6     | 0.4 ± 3.2           | -14.9 ± 8.0                           | GA01182 |
| FC5        | 12.3        | 69.4        | 0.2                                   | 0.0 ± 0.1     | -0.5 ± 2.3          | -18.4 ± 7.9                           | GA01183 |
| FD1        | -9.1        | 335.3       | 0.2                                   | 0.0 ± 0.1     | -0.1 ± 3.1          | -18.2 ± 8.8                           | GA01184 |
| FD2        | 1.6         | 80.5        | 0.1                                   | 0.0 ± 0.0     | 0.5 ± 2.6           | -12.3 ± 8.5                           | GA01185 |
| FD3        | -9.1        | 69.4        | 0.0                                   | 0.3 ± 1.6     | -2.4 ± 2.0          | -17.9 ± 8.1                           | GA01186 |
| FD4        | 1.6         | 135.9       | 0.1                                   | 0.7 ± 1.5     | -1.0 ± 2.0          | -8.6 ± 8.7                            | GA01187 |
| FD5        | -9.1        | 69.4        | 0.0                                   | 0.0 ± 0.1     | 0.5 ± 3.3           | -15.1 ± 8.5                           | GA01188 |
| WA1A       | -9.1        | 146.9       | -0.3                                  | 0.0 ± 0.0     | 2.2 ± 3.3           | -15.1 ± 7.8                           | GA01189 |
| WA2A       | 1.6         | 80.5        | -0.2                                  | -0.5 ± 0.3    | -1.9 ± 2.3          | -14.9 ± 7.7                           | GA01190 |
| WA3A       | 1.6         | -118.9      | 0.3                                   | 0.0 ± 0.1     | 0.1 ± 2.5           | -18.2 ± 9.5                           | GA01191 |
| WA4A       | 1.6         | -262.9      | 0.2                                   | 0.0 ± 0.1     | -3.0 ± 1.8          | -14.7 ± 8.1                           | GA01192 |
| WA5A       | -9.1        | -163.2      | 0.1                                   | 0.0 ± 0.0     | 0.5 ± 2.6           | -20.5 ± 7.6                           | GA01193 |
| WA1B       | -9.1        | 47.3        | -0.1                                  | -0.5 ± 0.3    | 2.6 ± 3.9           | -15.0 ± 7.6                           | GA01194 |
| WA2B       | -9.1        | 80.5        | -0.2                                  | 0.0 ± 0.1     | 0.7 ± 2.8           | -14.4 ± 7.6                           | GA01195 |
| WA3B       | 1.6         | -130.0      | -0.2                                  | 0.0 ± 0.1     | 1.7 ± 3.7           | -14.2 ± 7.8                           | GA01196 |
| WA4B       | -9.1        | 291.0       | -0.3                                  | 0.0 ± 0.0     | 1.7 ± 3.1           | -12.1 ± 8.0                           | GA01197 |
| WA5B       | -9.1        | 80.5        | -0.4                                  | 0.3 ± 1.6     | -1.3 ± 2.5          | -16.5 ± 8.9                           | GA01198 |
| WB1A       | 1.6         | -141.0      | -0.1                                  | 0.7 ± 1.5     | 3.0 ± 3.6           | -16.1 ± 7.6                           | GA01199 |
| QA         | N/A         | N/A         | N/A                                   | 0.0 ± 0.1     | -1.9 ± 2.4          | -12.6 ± 7.8                           | GA01200 |
| WB2A       | 12.3        | -174.3      | -0.2                                  | 0.0 ± 0.0     | 0.5 ± 2.6           | -17.5 ± 8.7                           | GA01201 |
| WB3A       | -9.1        | -229.7      | -0.2                                  | 0.3 ± 1.6     | -0.2 ± 3.0          | -17.0 ± 8.3                           | GA01202 |
| WB4A       | -9.1        | -52.4       | -0.2                                  | 0.0 ± 0.1     | 1.3 ± 3.0           | -14.7 ± 8.0                           | GA01203 |
| WB1B       | 12.3        | 169.1       | -0.2                                  | 0.0 ± 0.1     | 2.3 ± 3.9           | -15.6 ± 7.5                           | GA01204 |
| WB2B       | 12.3        | 590.0       | -0.3                                  | 0.9 ± 1.8     | 2.8 ± 3.5           | -16.6 ± 7.5                           | GA01205 |
| WB3B       | -9.1        | 202.3       | -0.3                                  | 1.1 ± 2.2     | 2.0 ± 3.7           | -14.6 ± 8.8                           | GA01206 |
| WB4B       | -9.1        | 58.3        | -0.3                                  | 0.7 ± 1.5     | 0.1 ± 2.5           | -15.8 ± 7.7                           | GA01207 |
| WC1A       | 5.0         | 124.8       | -0.2                                  | 0.0 ± 0.1     | 2.9± 4.1            | -17.8 ± 8.2                           | GA01208 |
| WC2A       | -9.1        | 146.9       | 0.0                                   | 0.9 ± 1.8     | -1.3 ± 1.7          | -19.4 ± 8.9                           | GA01209 |
| WC3A       | -9.1        | 80.5        | 0.1                                   | -0.5 ± 0.3    | -0.2 ± 3.0          | -19.3 ± 7.1                           | GA01210 |
| WC4A       | 1.6         | 91.6        | 0.1                                   | 0.0 ± 0.1     | -2.2 ± 1.2          | -23.3 ± 9.3                           | GA01211 |
| WC5A       | 15.1        | -141.0      | 0.3                                   | 0.0 ± 0.1     | 0.5 ± 3.3           | -17.4 ± 7.6                           | GA01212 |
| WC1B       | 1.6         | 335.3       | -0.1                                  | 0.0 ± 0.0     | -2.5 ± 0.5          | -16.6 ± 7.5                           | GA01213 |
| WC2B       | -9.1        | 69.4        | 0.2                                   | -0.5 ± 0.3    | -0.2 ± 3.0          | -16.5 ± 7.9                           | GA01214 |
| WC3B       | -9.1        | 291.0       | 0.1                                   | 0.7 ± 1.5     | 0.7 ± 2.8           | -32.7 ± 13.2                          | GA01215 |
| WC4B       | 12.3        | 390.6       | 0.3                                   | 0.0 ± 0.1     | 1.1 ± 3.5           | -9.9 ± 8.3                            | GA01216 |
| WC5B       | 1.6         | 390.6       | 0.5                                   | 0.0 ± 0.0     | -0.1 ± 2.4          | -14.7 ± 8.0                           | GA01217 |
| WD1A       | -9.1        | 169.1       | -0.1                                  | -0.5 ± 0.3    | -1.3 ± 2.5          | -16.3 ± 8.0                           | GA01218 |
| <u> </u>   |             |             | · · · · · · · · · · · · · · · · · · · | ·             | *                   |                                       | 1 1     |

C-17-1

|            |             | Fo          | rt Meade, | Building 2805 | (Room 3)            |              | <u> </u> |
|------------|-------------|-------------|-----------|---------------|---------------------|--------------|----------|
| Location   |             | Monitoring  |           |               | Wipe Test           | · ·          |          |
| Code       | Alpha       | Beta        | Gamma     | Alpha         | Beta                | LS           | Wipe     |
| (Units =>) | dpm/100cm^2 | dpm/100cm^2 | uR/hr     | dpı           | m/100cm^2 +/- 2 sig | ma           | Number   |
| (Bkgd =>)  | 1.7         | 149.47      | 5.00      | 0.2           | 2.2                 | 24.3         |          |
| (MDA =>)   | 54          | 401         | -         | 1.8           | 1.8                 | 26.2         |          |
| WC1B       | 1.6         | 246.6       | 1.3       | -0.2 ± 0.1    | 1.2 ± 2.4           |              | GA01143  |
| WC2B       | -9.1        | 346.3       | 1.3       | 0.4 ± 1.1     | -0.1 ± 1.9          | -15.4 ± 8.1  | GA01144  |
| WC3B       | 22.9        | 257.7       | 1.3       | -0.2 ± 0.1    | -0.1 ± 1.9          | -31.5 ± 11.7 | GA01145  |
| WC4B       | 12.3        | 689.7       | 1.2       | 0.4 ± 1.1     | -0.9 ± 1.5          | -17.8 ± 9.8  | GA01146  |
| WC5B       | 12.3        | 324.2       | 1.1       | -0.2 ± 0.1    | 1.2 ± 2.4           | -15.5 ± 7.8  | GA01147  |
| WC6B       | -9.1        | 412.8       | 1.0       | 0.4 ± 1.1     | -0.5 ± 1.7          | -12.6 ± 7.0  | GA01148  |
| WD1A       | 33.6        | 14.0        | 0.9       | 1.6 ± 2.0     | -0.1 ± 1.9          | -15.9 ± 9.0  | GA01149  |
| QA         | N/A         | N/A         | N/A       | 0.4 ± 1.1     | 0.4 ± 2.1           | -13.0 ± 7.9  | GA01150  |
| WD2A       | -9.1        | 25.1        | 0.9       | -0.2 ± 0.1    | -0.1 ± 1.9          | -16.2 ± 8.8  | GA01151  |
| WD3A       | -9.1        | 3.0         | 1.0       | -0.2 ± 0.1    | 2.0 ± 2.6           | -13.3 ± 8.8  | GA01152  |
| WD4A       | -9.1        | 124.8       | 0.7       | -0.2 ± 0.1    | -0.5 ± 1.7          | -14.7 ± 9.0  | GA01153  |
| WD1B       | 1.6         | 191.3       | 0.8       | -0.2 ± 0.1    | 0.8 ± 2.2           | -20.2 ± 8.5  | GA01154  |
| WD2B       | -9.1        | 135.9       | 0.7       | 0.4 ± 1.1     | -0.1 ± 1.9          | -12.7 ± 8.1  | GA01155  |
| WD3B       | 1.6         | 368.5       | 0.8       | -0.2 ± 0.1    | -0.9 ± 1.5          | -12.9 ± 8.1  | GA01156  |
| WD4B       | 1.6         | 368.5       | 0.8       | -0.2 ± 0.1    | 2.0 ± 2.6           | -14.0 ± 8.1  | GA01157  |
| RD1        | -9.1        | 268.8       | 0.6       | -0.2 ± 0.1    | 1.2 ± 2.4           | -12.0 ± 9.3  | GA01158  |
| RD2        | -9.1        | 412.8       | 0.5       | -0.2 ± 0.1    | 0.8 ± 2.2           | -14.2 ± 9.4  | GA01159  |
| RD3        | 1.6         | 313.1       | 0.6       | -0.2 ± 0.1    | 1.2 ± 2.4           | -18.1 ± 8.4  | GA01160  |
| RCNT4      | -9.1        | 357.4       | 0.6       | 1.0 ± 1.6     | -0.5 ± 1.7          | -14.7 ± 8.2  | GA01161  |
| PIPE       | 9.1         | 379.6       | 0.8       | 0.4 ± 1.1     | 0.4 ± 2.1           | -23.1 ± 10.3 | GA01162  |
| RCNT6      | -9.1        | 390.6       | 1.0       | -0.2 ± 0.1    | 0.4 ± 2.1           | -18.4 ± 8.5  | GA01163  |
| RCNT7      | 1.6         | 158.0       | 1.2       | -0.2 ± 0.1    | -0.5 ± 1.7          | -19.8 ± 8.4  | GA01164  |
| RD8        | -9.1        | 313.1       | 0.9       | -0.2 ± 0.1    | 1.6 ± 2.5           | -24.3 ± 8.0  | GA01165  |
| RD9        | -9.1        | 124.8       | 0.6       | -0.2 ± 0.1    | -0.5 ± 1.7          | 16.8 ± 11.9  | GA01166  |
| RSNK10     | -9.1        | 257.7       | 0.3       | -0.2 ± 0.1    | 0.4 ± 2.1           | -15.0 ± 8.4  | GA01167  |
| RD11       | -9.1        | 279.9       | 0.2       | 0.4 ± 1.1     | 1.2 ± 2.4           | -23.7 ± 9.9  | GA01168  |







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| · · ·      |             | Fo          | rt Meade, | Building 2805  | (Room 5)            |                 | ]       |
|------------|-------------|-------------|-----------|----------------|---------------------|-----------------|---------|
| Location   | · · · ·     | Monitoring  |           |                | Wipe Test           | · · · ·         |         |
| Code       | Alpha       | Beta        | Gamma     | Alpha          | Beta                | LS              | Wipe    |
| (Units =>) | dpm/100cm^2 | dpm/100cm^2 | uR/hr     | dpi            | m/100cm^2 +/- 2 sig | ma              | Number  |
| (Bkgd =>)  | 1.7         | 149.47      | 5.00      | 0.0            | 2.4                 | 20.4            | 1 1     |
| (MDA =>)   | 54          | 401         | -         | 2.6            | 2.8                 | 24.6            | 1       |
| WD2A       | -9.1        | 224.5       | -1.8      | 1.3 ± 1.9      | -1.9 ± 2.4          | -20.4 ± 8.2     | GA01292 |
| WD3A       | 1.6         | 124.8       | -1.9      | 0.0 ± 0.0      | 0.5 ± 2.6           | -20.2 ± 8.0     | GA01293 |
| WD4A       | -9.1        | 102.6       | -1.8      | -0.5 ± 0.3     | -0.2 ± 3.0          | -19.0 ± 8.1     | GA01294 |
| WD1B       | -9.1        | -307.2      | -1.8      | 0.7 ± 1.5      | 0.1 ± 2.5           | -19.5 ± 9.4     | GA01295 |
| WD2B       | 12.3        | 69.4        | -1.6      | 0.7 ± 1.3      | -0.1 ± 3.1          | -18.4 ± 8.5     | GA01296 |
| WD3B       | -9.1        | 224.5       | -1.7      | 0.0 ± 0.0      | -1.3 ± 1.7          | -17.4 ± 8.6     | GA01297 |
| WD4B       | 12.3        | -19.2       | -1.8      | -0.5 ± 0.3     | 0.4 ± 3.2           | -21.3 ± 7.8     | GA01298 |
| WE1A       | 12.3        | 135.9       | -1.8      | 0.0 ± 0.1      | -1.0 ± 2.0          | -18.0 ± 8.3     | GA01299 |
| QA         | N/A         | N/A         | N/A       | 0.0 ± 0.1      | -1.3 ± 2.7          | -17.3 ± 8.3     | GA01300 |
| WE2A       | 22.9        | 135.9       | -2.0      | $0.0 \pm 0.0$  | -1.3 ± 1.7          | -20.8 ± 8.5     | GA01301 |
| WE1B       | 1.6         | -30.3       | -1.9      | $-0.5 \pm 0.3$ | 0.4 ± 3.2           | -16.2 ± 8.9     | GA01302 |
| WE2B       | 1.6         | 102.6       | -2.0      | $0.0 \pm 0.1$  | $-1.0 \pm 2.0$      | -20.4 ± 9.1     | GA01303 |
| WF1A       | -9.1        | -85.7       | -2.1      | $0.0 \pm 0.1$  | $1.7 \pm 3.7$       | -17.5 ± 8.5     | GA01304 |
| W/F2A      | -91         | 47.3        | -21       | 0.0 ± 0.0      | -01+ 24             | -221+ 82        | GA01305 |
| WE3A       | -9.1        | 47.3        | -1.9      | -0.5 + 0.3     | -19+ 23             | -22.0 + 8.0     | GA01306 |
| WE4A       | 12.3        | -41.3       | -2.0      | 0.0 + 0.1      | 01+ 25              | -184+ 91        | GA01307 |
| WE1B       | 1.6         | 91.6        | -2.2      | 0.01 0.1       | 29+ 41              | -10.0 + 6.8     | GA01308 |
| WE2B       | 12.3        | 202.3       | -2.1      | 0.0 + 0.0      | 0.5 + 2.6           | -10.4 + 7.0     | GA01309 |
| WE3B       | -9.1        | -152.1      | -19       | 0.01 0.0       | 37+ 42              | -10.41 7.0      | GA01310 |
| WEAR       | 16          | -30.3       | -1.0      | 0.51 1.0       | -05+ 23             | -10.0 + 6.8     | GA01311 |
| WG1A       | -9.1        | -229.7      | -20       | $0.0 \pm 0.1$  | $-3.0 \pm 1.8$      | -79+ 72         | GA01312 |
| WG2A       | 12.3        | -85.7       | -2.0      | 0.01 0.1       | -0.7 + 2.1          | -10.3 + 6.9     | GA01313 |
| WG1B       | 16          | 47.3        | -22       | -05+03         | -02+ 30             | -10.0 1 0.5     | GA01314 |
| WG2B       | -91         | 1137        | -24       | 0.0+ 0.1       | 07+ 28              | -79+ 72         | GA01315 |
| WHIA       | 16          | 158.0       | -22       | 0.0 ± 0.1      | -07+29              | -97+ 68         | GA01316 |
| WH2A       | -9.1        | 213.4       | -22       | 0.0 + 0.0      | 34+ 37              | -41+ 74         | GA01317 |
| WH3A       | -91         | 80.5        |           | -0.5 + 0.3     | -02+ 30             | -70+72          | GA01318 |
| WH4A       | 16          | 113.7       | -22       | 07+ 15         | 01+ 25              | -129+ 66        | GA01319 |
| WH1B       | 16          | -74.6       | -2.2      | $0.7 \pm 1.3$  | $-0.7 \pm 2.9$      | $-10.5 \pm 7.0$ | GA01320 |
| WH2B       | 1.6         | 14.0        | -2.3      | 0.9± 1.8       | -0.1 ± 2.4          | $-50 \pm 72$    | GA01321 |
| WH3B       | 1.6         | 36.2        | -2.0      | $-0.5 \pm 0.3$ | -0.8 ± 2.8          | $-9.6 \pm 6.9$  | GA01322 |
| WH4B       | 1.6         | -141.0      | -2.2      | 0.0 ± 0.1      | $1.3 \pm 3.0$       | -10.5 ± 7.1     | GA01323 |
| RSNK1      | 12.3        | 58.3        | -2.1      | 0.7 ± 1.3      | -0.1 ± 3.1          | -6.1 ± 7.6      | GA01324 |
| RD2        | -9.1        | 36.2        | -2.3      | 0.0 ± 0.0      | 2.2 ± 3.3           | -11.0 ± 7.0     | GA01325 |
| RVNT3      | -9.1        | 224.5       | -2.1      | -0.5 ± 0.3     | -0.2 ± 3.0          | -20.1 ± 10.2    | GA01326 |
| RSNK4      | -9.1        | 69.4        | -2.1      | 0.0 ± 0.1      | 0.1 ± 2.5           | -6.8 ± 7.5      | GA01327 |
| RD5        | -9.1        | 213.4       | -2.1      | 0.0 ± 0.1      | -2.4 ± 2.1          | -15.3 ± 8.1     | GA01328 |
| RD6        | -9.1        | 180.2       | -1.9      | $0.0 \pm 0.0$  | -0.7 ± 2.1          | $-2.8 \pm 7.9$  | GA01329 |
| RD7        | -9.1        | 124.8       | -2.0      | 0.3± 1.6       | -1.9 ± 2.3          | -8.0 ± 8.1      | GA01330 |
| RD8        | -9.1        | 357.4       | -2.0      | 0.0 ± 0.1      | 0.7 ± 2.8           | -8.7 ± 7.1      | GA01331 |
| RD9        | -9.1        | 246.6       | -1.9      | 0.0 ± 0.1      | 0.5 ± 3.3           | -10.7 ± 7.1     | GA01332 |
| RD10       | 1.6         | 224.5       | -2.1      | 0.0 ± 0.0      | 2.8 ± 3.5           | -9.9 ± 8.6      | GA01333 |
| RCNT11     | -9.1        | 146.9       | -2.1      | -0.5 ± 0.3     | 0.4 ± 3.2           | -8.2 ± 7.4      | GA01334 |
| RD12       | 1.6         | 324.2       | -2.0      | 0.0 ± 0.1      | -1.0 ± 2.0          | -10.7 ± 7.6     | GA01335 |
| RD13       | -9.1        | 357.4       | -1.8      | 0.0 ± 0.1      | -2.4 ± 2.1          | -13.6 ± 9.2     | GA01336 |
| RD14       | -9.1        | 169.1       | -1.9      | 0.0 ± 0.0      | 2.8 ± 3.5           | -15.2 ± 8.3     | GA01337 |
| RVNT15     | 1.6         | 191.3       | -2.0      | 1.1 ± 2.2      | -0.2 ± 3.0          | -14.0 ± 10.1    | GA01338 |
| RVNT16     | 12.3        | 3.0         | -2.1      | 0.0 ± 0.1      | 1.8 ± 3.2           | -19.6 ± 11.5    | GA01339 |

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## Termination Survey Fort Meade, MD, 11 Aug 97-23 n 98

|            |             | Fo          | rt Meade, | Building 2805  | (Room 5)            |             |          |
|------------|-------------|-------------|-----------|----------------|---------------------|-------------|----------|
| Location   |             | Monitoring  |           |                | Wipe Test           | ·····       |          |
| Code       | Alpha       | Beta        | Gamma     | Alpha          | Beta                | LS          | Wipe     |
| (Units =>) | dpm/100cm^2 | dpm/100cm^2 | uR/hr     | dpi            | m/100cm^2 +/- 2 sig | ma          | Number   |
| (Bkgd =>)  | 1.7         | 149.47      | 5.00      | 0.0            | 2.4                 | 20.4        |          |
| (MDA =>)   | 54          | 401         | -         | 2.6            | 2.8                 | 24.6        | 1        |
| FA1        | -9.1        | 202.3       | -1.9      | 1.1 ± 2.2      | -0.8 ± 2.8          | -20.5 ± 7.6 | GA01242  |
| FA2        | -9.1        | 80.5        | -1.9      | 0.0 ± 0.1      | -1.0 ± 2.0          | -23.9 ± 7.3 | GA01243  |
| FA3        | 1.6         | 246.6       | -1.8      | 0.0 ± 0.1      | -1.9 ± 2.4          | -21.3 ± 8.1 | GA01244  |
| FA4        | -9.1        | 146.9       | -1.9      | 0.0 ± 0.0      | 1.1 ± 2.9           | -18.3 ± 8.4 | GA01245  |
| FA5        | 1.6         | 180.2       | -2.0      | -0.5 ± 0.3     | -0.2 ± 3.0          | -14.0 ± 8.3 | GA01246  |
| FA6        | -9.1        | 146.9       | -2.0      | 0.0 ± 0.1      | -0.5 ± 2.3          | -16.0 ± 8.1 | GA01247  |
| FB1        | 1.6         | 279.9       | -1.9      | 0.0 ± 0.1      | -2.4 ± 2.1          | -19.2 ± 8.4 | GA01248  |
| FB2        | -9.1        | 457.1       | -2.0      | 0.0 ± 0.0      | 1.1 ± 2.9           | -19.1 ± 8.9 | GA01249  |
| QA         | N/A         | N/A         | N/A       | 0.3 ± 1.6      | -1.9 ± 2.3          | -17.1 ± 7.7 | GA01250  |
| FB3        | 12.3        | 202.3       | -2.0      | 0.0 ± 0.1      | 1.8 ± 3.2           | -21.5 ± 8.8 | GA01251  |
| FB4        | -9.1        | 235.6       | -1.9      | 0.0 ± 0.1      | -3.0 ± 1.8          | -21.7 ± 8.8 | GA01252  |
| FB5        | -9.1        | 102.6       | -1.8      | 0.0 ± 0.0      | 1.1 ± 2.9           | -16.5 ± 8.3 | GA01253  |
| FB6        | -9.1        | 169.1       | -1.9      | -0.5 ± 0.3     | 0.9± 3.4            | -17.1 ± 8.2 | GA01254  |
| FC1        | 12.3        | 922.3       | -1.9      | 0.0 ± 0.1      | 1.3 ± 3.0           | -15.5 ± 8.3 | GA01255  |
| FC2        | -9.1        | 235.6       | -1.7      | 0.0 ± 0.1      | 0.5± 3.3            | -16.5 ± 8.4 | GA01256  |
| FC3        | 1.6         | 36.2        | -1.6      | 0.0 ± 0.0      | -0.7 ± 2.1          | -20.5 ± 8.3 | GA01257  |
| FC4        | -9.1        | 113.7       | -1.8      | 0.3 ± 1.6      | -1.9 ± 2.3          | -12.4 ± 8.9 | GA01258  |
| FC5        | -9.1        | -30.3       | -1.9      | 0.0 ± 0.1      | 0.1 ± 2.5           | -20.5 ± 7.7 | GA01259  |
| FC6        | 1.6         | 313.1       | -2.0      | 0.0 ± 0.1      | -1.3 ± 2.7          | -17.9 ± 8.5 | GA01260  |
| FD1        | 1.6         | 346.3       | -1.8      | 0.0 ± 0.0      | -0.1 ± 2.4          | -17.8 ± 8.2 | GA01261  |
| FD2        | 1.6         | 69.4        | -1.9      | -0.5 ± 0.3     | -0.8 ± 2.8          | -17.2 ± 7.9 | GA01262  |
| FD3        | 12.3        | -8.1        | -2.0      | 0.0 ± 0.1      | 1.3 ± 3.0           | -27.9 ± 9.3 | GA01263  |
| FD4        | 22.9        | 124.8       | -2.0      | 0.0 ± 0.1      | -1.3 ± 2.7          | -25.6 ± 8.1 | GA01264  |
| FD5        | -9.1        | 36.2        | -2.0      | 0.0 ± 0.0      | $-2.5 \pm 0.5$      | -20.7 ± 8.3 | GA01265  |
| FD6        | -9.1        | 14.0        | -1.9      | -0.5 ± 0.3     | -1.3 ± 2.5          | -18.4 ± 8.5 | GA01266  |
| WAIA       | -9.1        | 14.0        | -1.7      | 0.0 ± 0.1      | 0.1 ± 2.5           | -21.9 ± 8.0 | GA01267  |
| WA2A       | -9.1        | -8.1        | -2.0      | 0.0 ± 0.1      | -1.3 ± 2.7          | -21.9 ± 8.0 | GA01268  |
| WA3A       | 33.6        | 3.0         | -2.0      | 0.0 ± 0.0      | 0.5 ± 2.6           | -20.9 ± 8.1 | GA01269  |
| WA4A       | 1.6         | 191.3       | -2.1      | -0.5 ± 0.3     | -1.3 ± 2.5          | -20.8 ± 8.0 | GA01270  |
| WA1B       | 1.6         | -41.3       | -2.1      | 0.0 ± 0.1      | 3.0 ± 3.6           | -18.7 ± 8.7 | GA01271  |
| WA2B       | 1.6         | 14.0        | -2.1      | 0.0 ± 0.1      | -1.3 ± 2.7          | -25.1 ± 9.1 | GA01272  |
| WA3B       | -9.1        | 268.8       | -2.3      | 0.0 ± 0.0      | 1.1 ± 2.9           | -20.6 ± 8.6 | GA01273  |
| WA4B       | 12.3        | -8.1        | -2.3      | -0.5 ± 0.3     | -1.3 ± 2.5          | -23.0 ± 8.4 | GA01274  |
| WB1A       | 33.6        | 246.6       | -2.2      | 0.0 ± 0.1      | -1.6 ± 1.7          | -19.8 ± 8.3 | GA01275  |
| WB2A       | -9.1        | 146.9       | -2.4      | 0.0 ± 0.1      | -2.4 ± 2.1          | -15.4 ± 8.8 | GA01276  |
| WB3A       | -9.1        | 36.2        | -2.2      | 0.0 ± 0.0      | -0.1 ± 2.4          | -18.6 ± 8.2 | GA01277  |
| WB4A       | -9.1        | -85.7       | -2.1      | -0.5 ± 0.3     | 1.5 ± 3.5           | -17.3 ± 8.7 | GA01278  |
| WB1B       | -9.1        | 14.0        | -2.1      | 0.7 ± 1.5      | 2.4 ± 3.4           | -26.1 ± 8.9 | GA01279  |
| WB2B       | 1.6         | 36.2        | -2.0      | $0.0 \pm 0.1$  | -1.9 ± 2.4          | -19.6 ± 8.2 | GA01280  |
| WB3B       | 25.2        | -107.8      | -2.0      | 0.0 ± 0.0      | -0.7 ± 2.1          | -14.7 ± 8.5 | GA01281  |
| WB4B       | -9.1        | -41.3       | -2.0      | -0.5 ± 0.3     | -0.2 ± 3.0          | -19.3 ± 8.6 | GA01282  |
| WC1A       | -9.1        | -141.0      | -2.0      | 0.0 ± 0.1      | 0.7 ± 2.8           | -18.2 ± 8.6 | GA01283  |
| WC2A       | 12.3        | -229.7      | -1.9      | U.U ± 0.1      | -1.9± 2.4           | -20.6 ± 8.4 | IGA01284 |
| WC3A       | -9.1        | -141.0      | -1.9      | 0.0 ± 0.0      | 0.5± 2.6            | -20.0 ± 8.6 | GA01285  |
| WC4A       | 12.3        | -19.2       | -2.0      | $-0.5 \pm 0.3$ | $1.5 \pm 3.5$       | -16.8 ± 9.2 | GA01286  |
| WC1B       | -9.1        | 135.9       | -2.0      | $0.0 \pm 0.1$  | 3.5± 3.7            | -18.6 ± 8.4 | GA01287  |
| WC2B       | 1.6         | -19.2       | -1.9      |                | -0.1± 3.1           | -1/./± 8.5  | GAU1288  |
| WC3B       | 1.6         | -8.1        | -1.9      | U.9 I 1.8      | -1.3 I 1./          | -20.8 ± 8.9 | GAU1289  |
| WC4B       | 1.6         | -52.4       | -1.9      | -U.3 I U.3     | -0.2 ± 3.0          | -14.41 8./  | GA01290  |
| WD1A       | 1.6         | 146.9       | -1.0      | U.U II U.I     | I -1.UI 2.U         | -23.7± 9.9  | GAU1291  |

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| Fort Meade, Building 2805 (Room 6) |             |             |       |            |                     |              |         |  |
|------------------------------------|-------------|-------------|-------|------------|---------------------|--------------|---------|--|
| Location                           |             | Monitoring  |       |            | Wipe Test           |              |         |  |
| Code                               | Alpha       | Beta        | Gamma | Alpha      | Beta                | LS           | Wipe    |  |
| (Units =>)                         | dpm/100cm^2 | dpm/100cm^2 | uR/hr | dpi        | m/100cm^2 +/- 2 sig | ma           | Number. |  |
| (Bkgd =>)                          | 1.7         | 149.47      | 5.00  | 0.0        | 2.4                 | 20.4         |         |  |
| (MDA =>)                           | 54          | 401         | - '   | 2.6        | 2.8                 | 36.0         |         |  |
| FA1                                | -9.1        | -163.2      | -1.6  | 0.0 ± 0.1  | 0.5 ± 3.3           |              | GA01340 |  |
| FA2                                | 33.6        | 91.6        | -1.6  | .0.0 ± 0.0 | 1.1 ± 2.9           | -5.6 ± 8.2   | GA01341 |  |
| FA3                                | -9.1        | 135.9       | -1.8  | -0.5 ± 0.3 | -0.8 ± 2.8          | -13.5 ± 7.4  | GA01342 |  |
| FA4                                | -9.1        | 58.3        | -1.9  | 0.0 ± 0.1  | 0.7 ± 2.8           | -9.8 ± 8.0   | GA01343 |  |
| FB1                                | 1.6         | 146.9       | -2.0  | 0.0 ± 0.1  | -2.4 ± 2.1          | -12.2 ± 7.5  | GA01344 |  |
| FB2                                | -9.1        | 368.5       | -1.9  | 0.0 ± 0.0  | -0.7 ± 2.1          | -9.4 ± 8.0   | GA01345 |  |
| FB3                                | -9.1        | 91.6        | -2.0  | 0.3 ± 1.6  | 0.4 ± 3.2           | -13.1 ± 7.7  | GA01346 |  |
| FB4                                | 1.6         | 268.8       | -1.9  | 0.0 ± 0.1  | 1.3 ± 3.0           | -9.3 ± 7.8   | GA01347 |  |
| FC1                                | -9.1        | 313.1       | -2.0  | 0.0 ± 0.1  | -1.3 ± 2.7          | -14.1 ± 7.1  | GA01348 |  |
| FC2                                | -9.1        | 169.1       | -2.0  | 0.0 ± 0.0  | -0.1 ± 2.4          | -9.3 ± 7.6   | GA01349 |  |
| FC3                                | -9.1        | 335.3       | -1.9  | -0.5 ± 0.3 | 0.4 ± 3.2           | -8.3 ± 7.0   | GA01350 |  |
| QA                                 | N/A         | N/A         | N/A   | 0.0 ± 0.1  | 1.3 ± 3.0           | -7.5 ± 8.3   | GA01351 |  |
| FC4                                | -9.1        | 268.8       | -1.7  | 0.0 ± 0.1  | -1.9 ± 2.4          | -11.1 ± 7.7  | GA01352 |  |
| FD1                                | -9.1        | 14.0        | -2.0  | 0.0 ± 0.0  | 0.5 ± 2.6           | -28.3 ± 9.3  | GA01353 |  |
| FD2                                | -9.1        | 169.1       | -2.0  | -0.5 ± 0.3 | 0.9 ± 3.4           | -30.9 ± 9.0  | GA01354 |  |
| FD3                                | 12.3        | 36.2        | -1.8  | 0.0 ± 0.1  | -0.5 ± 2.3          | -27.1 ± 9.9  | GA01355 |  |
| FD4                                | 1.6         | 91.6        | -1.8  | 0.0 ± 0.1  | -1.3 ± 2.7          | -30.4 ± 10.0 | GA01356 |  |
| WA1A                               | -9.1        | 14.0        | -1.7  | 0.0 ± 0.0  | -0.7 ± 2.1          | -30.7 ± 10.1 | GA01357 |  |
| WA2A                               | 12.3        | 58.3        | -1.8  | 0.3 ± 1.6  | -0.2 ± 3.0          | -20.9 ± 9.1  | GA01358 |  |
| WA3A                               | -9.1        | -30.3       | -1.7  | 0.7 ± 1.5  | 0.1 ± 2.5           | -21.6 ± 9.4  | GA01359 |  |
| WA4A                               | -9.1        | -107.8      | -1.5  | 0.7 ± 1.3  | -1.9 ± 2.4          | -28.9 ± 9.6  | GA01360 |  |
| WA1B                               | -9.1        | 25.1        | -1.7  | 0.9 ± 1.8  | 0.5 ± 2.6           | -23.8 ± 8.7  | GA01361 |  |
| WA2B                               | 12.3        | 36.2        | -1.6  | -0.5 ± 0.3 | 0.4 ± 3.2           | -24.7 ± 8.8  | GA01362 |  |
| WA3B                               | 22.9        | 124.8       | -1.6  | 0.0 ± 0.1  | -1.6 ± 1.7          | -42.6 ± 12.5 | GA01363 |  |
| WA4B                               | 1.6         | 102.6       | -1.7  | 0.0 ± 0.1  | -1.9 ± 2.4          | -26.2 ± 8.6  | GA01364 |  |
| WB1A                               | -9.1        | -152.1      | -1.6  | 0.0 ± 0.0  | 0.5 ± 2.6           | -34.2 ± 11.0 | GA01365 |  |
| WB2A                               | 1.6         | -141.0      | -1.7  | 0.3 ± 1.6  | -0.8 ± 2.8          | -34.2 ± 11.0 | GA01366 |  |
| WB3A                               | -9.1        | -85.7       | -1.9  | 0.0 ± 0.1  | -1.0 ± 2.0          | -27.7 ± 9.2  | GA01367 |  |
| WB4A                               | 5.0         | -174.3      | -2.0  | 0.0 ± 0.1  | -0.1 ± 3.1          | -30.4 ± 9.6  | GA01368 |  |
| WB1B                               | -9.1        | 47.3        | -1.6  | 0.0 ± 0.0  | -1.9 ± 1.3          | -24.6 ± 8.7  | GA01369 |  |
| WB2B                               | 12.3        | 224.5       | -1.6  | -0.5 ± 0.3 | -1.3 ± 2.5          | -38.6 ± 12.9 | GA01370 |  |
| WB3B                               | 1.6         | 257.7       | -1.8  | 0.0 ± 0.1  | 0.1 ± 2.5           | -27.1 ± 8.4  | GA01371 |  |
| WB4B                               | -9.1        | 124.8       | -1.8  | 0.7 ± 1.3  | 1.1 ± 3.5           | -49.1 ± 13.0 | GA01372 |  |
| WC1A                               | -9.1        | -63.5       | -1.8  | 0.0 ± 0.0  | 0.5 ± 2.6           | -41.6 ± 11.7 | GA01373 |  |
| WC2A                               | -9.1        | 191.3       | -1.8  | 1.1 ± 2.2  | -1.9 ± 2.3          | -16.6 ± 9.3  | GA01374 |  |
| WC3A                               | 12.3        | 36.2        | -1.9  | 0.0 ± 0.1  | 0.1 ± 2.5           | -18.3 ± 9.2  | GA01375 |  |
| WC4A                               | 1.6         | 202.3       | -1.9  | 0.0 ± 0.1  | 0.5 ± 3.3           | -22.1 ± 8.6  | GA01376 |  |
| WC1B                               | -9.1        | 146.9       | -2.0  | 0.0 ± 0.0  | 1.1 ± 2.9           | -25.5 ± 8.5  | GA01377 |  |
| WC2B                               | -9.1        | 58.3        | -2.0  | -0.5 ± 0.3 | -0.8 ± 2.8          | -19.1 ± 9.1  | GA01378 |  |
| WC3B                               | 12.3        | 180.2       | -1.8  | 0.0 ± 0.1  | -1.6 ± 1.7          | -19.6 ± 9.3  | GA01379 |  |
| WC4B                               | -9.1        | 169.1       | -2.0  | 0.0 ± 0.1  | -1.9 ± 2.4          | -20.4 ± 9.0  | GA01380 |  |
| WD1A                               | -9.1        | -107.8      | -2.2  | 0.9 ± 1.8  | -0.7 ± 2.1          | -22.1 ± 8.8  | GA01381 |  |
| WD2A                               | 1.6         | 80.5        | -2.3  | -0.5 ± 0.3 | 2.0 ± 3.7           | -21.8 ± 9.6  | GA01382 |  |
| WD3A                               | 12.3        | 158.0       | -2.4  | 0.0 ± 0.1  | -1.6 ± 1.7          | -24.3 ± 8.6  | GA01383 |  |
| WD4A                               | 1.6         | 25.1        | -2.3  | 0.7 ± 1.3  | -0.7 ± 2.9          | -31.1 ± 11.3 | GA01384 |  |
| WD1B                               | -9.1        | 80.5        | -2.5  | 0.0 ± 0.0  | -0.7 ± 2.1          | -17.9 ± 9.2  | GA01385 |  |
| WD2B                               | -9.1        | . 14.0      | -2.4  | 0.3 ± 1.6  | -3.5 ± 1.3          | -20.4 ± 9.0  | GA01386 |  |
| WD3B                               | 5.0         | -107.8      | -2.5  | 0.0 ± 0.1  | -0.5 ± 2.3          | -25.6 ± 9.5  | GA01387 |  |
| WD4B                               | 20.1        | -196.4      | -2.3  | 0.0 ± 0.1  | 1.1 ± 3.5           | -21.3 ± 8.9  | GA01388 |  |
| RCNT1                              | -9.1        | 191.3       | -2.2  | 0.0 ± 0.0  | -0.1 ± 2.4          | -18.5 ± 8.1  | GA01389 |  |

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|            | · ·         | Fo          | rt Meade, | Building 2805 | (Room 6)          |                      |         |
|------------|-------------|-------------|-----------|---------------|-------------------|----------------------|---------|
| Location   | Monitoring  |             |           |               | Wipe Test         | ·····                |         |
| Code       | Alpha       | Beta        | Gamma     | Alpha         | Beta              | LS                   | Wipe    |
| (Units =>) | dpm/100cm^2 | dpm/100cm^2 | uR/hr     | dp            | m/100cm^2 +/- 2 s | igma                 | Number  |
| (Bkgd =>)  | 1.7         | 149.47      | 5.00      | 0.0           | 2.4               | 20.4                 |         |
| (MDA =>)   | 54          | 401         | -         | 2.6           | 2.8               | 36.0                 | -       |
| RCNT2      | -9.1        | 36.2        | -1.8      | 0.3 ± 1.6     | 2.0 ± 3.7         | <b>⊿</b> -26.7 ± 9.7 | GA01390 |
| RVNT3      | -9.1        | 124.8       | -1.6      | 0.0 ± 0.1     | 0.7 ± 2.8         | -33.6 ± 17.3         | GA01391 |
| RCNT4      | -9.1        | 169.1       | -1.5      | 0.0 ± 0.1     | -1.9 ± 2.4        | -21.3 ± 8.9          | GA01392 |
| RSNK5      | 1.6         | -8.1        | -1.4      | 0.0 ± 0.0     | 1.1 ± 2.9         | -18.8 ± 13.7         | GA01393 |
| RCAB6      | -9.1        | 91.6        | -1.8      | · -0.5 ± 0.3  | -1.3 ± 2.5        | -23.6 ± 9.4          | GA01394 |
| RD7        | 1.6         | 124.8       | -1.8      | 0.0 ± 0.1     | -0.5 ± 2.3        | -28.9 ± 10.8         | GA01395 |
| RD8        | 12.3        | 135.9       | -1.8      | 0.0 ± 0.1     | 0.5 ± 3.3         | -20.9 ± 9.7          | GA01396 |
| RCNT9      | -9.1        | 14.0        | -1.6      | 0.0 ± 0.0     | -0.1 ± 2.4        | -26.2 ± 9.7          | GA01397 |

C-20-2

بريدة فالالان المتحمد



## Termination Survey, Fort Meade, MD, 11 Aug 97-23 n 98

|            | ······································ | Fo          | rt Meade,     | Building 2805 | (Room 7)            |              |         |
|------------|----------------------------------------|-------------|---------------|---------------|---------------------|--------------|---------|
| Location   | 1                                      | Monitoring  |               |               | Wipe Test           |              |         |
| Code       | Alpha                                  | Beta        | Gamma         | Alpha         | Beta                | LS           | Wipe    |
| (Units =>) | dpm/100cm^2                            | dpm/100cm^2 | uR/hr         | dpi           | m/100cm^2 +/- 2 sig | ma           | Number  |
| (Bkgd =>)  | 1.7                                    | 149.47      | 5.00          | 0.0           | 2.4                 | 28.8         | 1       |
| (MDA =>)   | 54                                     | 401         | -             | 2.6           | 2.6                 | 48.8         | 1       |
| FA1        | 1.6                                    | 966.6       | -1.8          | 0.3 ± 1.6     | -0.8 ± 2.8          |              | GA01398 |
| FA2        | 33.6                                   | 180.2       | -1.7          | 0.0 ± 0.1     | 3.0 ± 3.6           | -20.0 ± 11.4 | GA01399 |
| QA         | N/A                                    | N/A         | N/A           | 0.5 ± 1.3     | -0.2 ± 2.2          | -14.0 ± 8.5  | GA01400 |
| FA3        | -9.1                                   | 102.6       | -1.8          | -0.2 ± 0.1    | 0.8 ± 2.6           | -22.7 ± 13.3 | GA01401 |
| FA4        | -9.1                                   | 102.6       | -1.8          | -0.2 ± 0.1    | -2.1 ± 1.1          | -21.1 ± 11.3 | GA01402 |
| FB1        | -9.1                                   | 268.8       | -1.5          | -0.2 ± 0.1    | 1.3 ± 2.8           | -10.4 ± 9.1  | GA01403 |
| FB2        | 33.6                                   | 368.5       | -1.5          | -0.2 ± 0.1    | 1.3 ± 2.8           | -8.8 ± 9.9   | GA01404 |
| FB3        | -9.1                                   | 180.2       | -1.6          | 1.1 ± 1.8     | 3.3 ± 3.4           | -16.6 ± 9.8  | GA01405 |
| FB4        | -9.1                                   | 146.9       | -1.6          | 0.5.± 1.3     | 1.3 ± 2.8           | -19.5 ± 9.8  | GA01406 |
| WA1A       | -9.1                                   | 102.6       | -1.5          | -0.2 ± 0.1    | 1.3 ± 2.8           | -15.2 ± 8.6  | GA01407 |
| WA2A       | 1.6                                    | -19.2       | -1.4          | 0.5± 1.3      | 0.3 ± 2.4           | -14.0 ± 8.5  | GA01408 |
| WA3A       | 10.1                                   | 80.5        | -1.5          | 0.5 ± 1.3     | 0.3 ± 2.4           | -17.0 ± 8.5  | GA01409 |
| WA4A       | 1.6                                    | -30.3       | -1.6          | -0.2 ± 0.1    | 0.8 ± 2.6           | -10.6 ± 8.9  | GA01410 |
| WA1B       | -9.1                                   | 169.1       | -1.5          | 2.4 ± 2.5     | 3.8 ± 3.5           | -16.1 ± 8.6  | GA01411 |
| WA2B       | -9.1                                   | 58.3        | -1.5          | -0.2 ± 0.1    | 0.8 ± 2.6           | -13.0 ± 8.9  | GA01412 |
| WA3B       | 1.6                                    | 302.0       | -1.6          | -0.2 ± 0.1    | 0.8 ± 2.6           | -15.7 ± 8.6  | GA01413 |
| WA4B       | -9.1                                   | 268.8       | -1.8          | 2.4 ± 2.5     | 1.3 ± 2.8           | -32.6 ± 14.1 | GA01414 |
| WB1A       | 1.6                                    | 47.3        | -1.9          | -0.2 ± 0.1    | 0.3 ± 2.4           | -18.7 ± 8.3  | GA01415 |
| WB2A       | 1.6                                    | 91.6        | / <b>-2.1</b> | 0.5 ± 1.3     | -1.2 ± 1.7          | -19.6 ± 8.0  | GA01416 |
| WB1B       | 1.6                                    | 146.9       | -2.1          | -0.2 ± 0.1    | 2.3 ± 3.1           | -15.2 ± 8.6  | GA01417 |
| WB2B       | 1.6                                    | 91.6        | -2.1          | -0.2 ± 0.1    | -0.7 ± 2.0          | -11.1 ± 8.8  | GA01418 |
| WC1A       | -9.1                                   | -85.7       | -2.1          | -0.2 ± 0.1    | -1.2 ± 1.7          | -17.5 ± 8.0  | GA01419 |
| WC2A       | 12.3                                   | 3.0         | -2.1          | -0.2 ± 0.1    | 1.3 ± 2.8           | -15.3 ± 8.4  | GA01420 |
| WC3A       | 1.6                                    | -52.4       | -2.0          | -0.2 ± 0.1    | 0.3 ± 2.4           | -15.7 ± 8.4  | GA01421 |
| WC4A       | 12.3                                   | 14.0        | -2.1          | -0.2 ± 0.1    | 0.8 ± 2.6           | -14.5 ± 8.5  | GA01422 |
| WC1B       | 12.3                                   | 3.0         | -2.1          | 0.5 ± 1.3     | 1.8 ± 2.9           | -17.0 ± 8.3  | GA01423 |
| WC2B       | 1.6                                    | 80.5        | -2.0          | -0.2 ± 0.1    | 0.3 ± 2.4           | -15.3 ± 8.4  | GA01424 |
| WC3B       | -9.1                                   | 158.0       | -1.9          | -0.2 ± 0.1    | -0.7 ± 2.0          | -14.5 ± 8.5  | GA01425 |
| WC4B       | 1.6                                    | -96.7       | -1.8          | -0.2 ± 0.1    | -0.2 ± 2.2          | -24.6 ± 9.5  | GA01426 |
| WD1A       | 1.6                                    | 25.1        | -2.2          | 0.5 ± 1.3     | 1.8 ± 2.9           | -14.3 ± 8.7  | GA01427 |
| WD2A       | 22.9                                   | 180.2       | -2.1          | -0.2 ± 0.1    | 4.3 ± 3.6           | -18.3 ± 8.3  | GA01428 |
| WD1B       | 22.9                                   | 80.5        | -2.1          | 1.1 ± 1.8     | 0.3 ± 2.4           | -20.5 ± 8.8  | GA01429 |
| WD2B       | 12.3                                   | 135.9       | -1.9          | -0.2 ± 0.1    | -1.2 ± 1.7          | -14.9 ± 8.5  | GA01430 |
| RVNT       | -9.1                                   | 102.6       | -2.1          | 3.0 ± 2.8     | 6.2 ± 4.1           | -37.6 ± 23.7 | GA01431 |

|            | ······································ | Fo          | rt Meade, | Building 2805 | (Room 8)            |             |         |
|------------|----------------------------------------|-------------|-----------|---------------|---------------------|-------------|---------|
| Location   |                                        | Monitoring  | •         | -             | Wipe Test           |             |         |
| Code       | Alpha                                  | Beta        | Gamma     | Alpha         | Beta                | LS          | Wipe    |
| (Units =>) | dpm/100cm^2                            | dpm/100cm^2 | uR/hr     | dpi           | m/100cm^2 +/- 2 sig | ma          | Number  |
| (Bkgd =>)  | 1.7                                    | 149.47      | 5.00      | 0.2           | 2.7                 | 26.5        |         |
| (MDA =>)   | 54                                     | 401         | •         | 2.0           | 2.2                 | 18.8        | 1 ]     |
| FA1        | 22.9                                   | 1321.1      | -3.5      | -0.2 ± 0.1    | 0.8 ± 2.6           | -10.4 ± 7.9 | GA01432 |
| FA2        | 12.3                                   | 1542.6      | -3.1      | 3.7 ± 3.1     | 2.3 ± 3.1           | -9.2 ± 8.0  | GA01433 |
| FA3        | 12.3                                   | 1487.2      | -2.7      | -0.2 ± 0.1    | -1.2 ± 1.7          | -10.0 ± 8.0 | GA01434 |
| FB1        | 1.6                                    | 1487.2      | -2.4      | 0.0 ± 0.0     | -0.6 ± 2.0          | -11.2 ± 7.9 | GA01435 |
| FB2        | -9.1                                   | 1454.0      | -2.1      | -0.2 ± 0.1    | 0.8 ± 2.6           | -9.2 ± 8.0  | GA01436 |
| FB3        | -9.1                                   | 1199.2      | -1.9      | -0.2 ± 0.1    | 1.3 ± 2.8           | -11.5 ± 7.8 | GA01437 |
| WA1A       | 1.6                                    | -41.3       | -1.9      | -0.2 ± 0.1    | -0.7 ± 2.0          | -16.2 ± 7.4 | GA01438 |
| WA2A       | -9.1                                   | 3.0         | -1.8      | -0.2 ± 0.1    | 0.8 ± 2.6           | -17.3 ± 7.3 | GA01439 |
| WA3A       | 12.3                                   | 191.3       | -1.6      | -0.2 ± 0.1    | -1.2 ± 1.7          | -11.9 ± 7.8 | GA01440 |
| WA1B       | -9.1                                   | 146.9       | -1.4      | -0.2 ± 0.1    | 1.3 ± 2.8           | -11.2 ± 7.9 | GA01441 |
| WA2B       | -9.1                                   | 36.2        | -1.5      | 0.5 ± 1.3     | -0.7 ± 2.0          | -13.1 ± 7.7 | GA01442 |
| WA3B       | -9.1                                   | 36.2        | -1.4      | -0.2 ± 0.1    | -0.7 ± 2.0          | -15.8 ± 8.2 | GA01443 |
| WB1A       | 40.3                                   | 988.8       | -1.4      | -0.2 ± 0.1    | 0.8± 2.6            | -16.2 ± 8.1 | GA01444 |
| WB2A       | 1.6                                    | -85.7       | -1.4      | -0.2 ± 0.1    | 0.3 ± 2.4           | -16.9 ± 8.0 | GA01445 |
| WB1B       | -9.1                                   | 14.0        | -1.4      | -0.2 ± 0.1    | 1.3 ± 2.8           | -18.1 ± 7.9 | GA01446 |
| WB2B       | 1.6                                    | -8.1        | -1.4      | -0.2 ± 0.1    | 0.3 ± 2.4           | -15.0 ± 8.2 | GA01447 |
| WC1A       | -9.1                                   | 14.0        | -1.5      | -0.2 ± 0.1    | -0.7 ± 2.0          | -13.1 ± 8.4 | GA01448 |
| WC2A       | 1.6                                    | 47.3        | -1.5      | -0.2 ± 0.1    | -0.7 ± 2.0          | -17.3 ± 8.0 | GA01449 |
| BLANK      | -9.1                                   | 25.1        | -1.1      | -0.2 ± 0.1    | 1.3 ± 2.8           | -21.7 ± 8.6 | GA01450 |
| WC3A       | 1.6                                    | 146.9       | -1.6      | 1.8 ± 2.2     | 1.3 ± 2.8           | -16.2 ± 8.1 | GA01451 |
| WC1B       | 1.6                                    | 69.4        | -1.5      | 0.5± 1.3      | 0.3 ± 2.4           | -13.8 ± 8.3 | GA01452 |
| WC2B       | -9.1                                   | -141.0      | -1.6      | -0.2 ± 0.1    | -1.6 ± 1.5          | -16.9 ± 8.0 | GA01453 |
| WC3B       | -9.1                                   | -41.3       | 1.7       | -0.2 ± 0.1    | -0.7 ± 2.0          | -15.4 ± 8.2 | GA01454 |
| WD1A       | 1.6                                    | 58.3        | -1.9      | -0.2 ± 0.1    | 0.3 ± 2.4           | -18.5 ± 7.9 | GA01455 |
| WD2A       | -9.1                                   | 3.0         | -1.9      | -0.2 ± 0.1    | -0.2 ± 2.2          | -18.8 ± 7.9 | GA01456 |
| WD1B       | 1.6                                    | 180.2       | -1.7      | 0.5 ± 1.3     | 0.3 ± 2.4           | -17.3 ± 8.0 | GA01457 |
| WD2B       | -9.1                                   | 113.7       | -1.7      | -0.2 ± 0.1    | 0.8 ± 2.6           | -16.2 ± 8.1 | GA01458 |
| RD1        | 10.1                                   | 191.3       | -1.9      | -0.2 ± 0.1    | -0.2 ± 2.2          | -15.0 ± 8.2 | GA01459 |
| RSHFL2     | 1.6                                    | 379.6       | -1.5      | -0.2 ± 0.1    | 1.8 ± 2.9           | -16.9 ± 8.0 | GA01460 |
| RSNK       | 33.6                                   | 2528.4      | -1.5      | 2.4 ± 2.5     | -0.7 ± 2.0          | -13.1 ± 8.4 | GA01461 |

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| ·          |             | Fo          | rt Meade, | Building 2805 | (Room 9)            | · · ·        |         |
|------------|-------------|-------------|-----------|---------------|---------------------|--------------|---------|
| Location   |             | Monitoring  |           |               | Wipe Test           |              |         |
| Code       | Alpha       | Beta        | Gamma     | Alpha         | Beta                | LS           | Wipe    |
| (Units ≍>) | dpm/100cm^2 | dpm/100cm^2 | uR/hr     | dp            | m/100cm^2 +/- 2 sig | ma           | Number  |
| (Bkgd =>)  | 1.7         | 149.47      | 5.00      | 0.0           | 2.4                 | 29.6         |         |
| (MDA =>)   | 54          | 386         | -         | 2.1           | 2.4                 | 20.6         |         |
| FA1        | 22.9        | 1239.0      | -1.5      | 1.1 ± 1.8     | 0.3 ± 2.4           | -20.5 ± 9.5  | GA01462 |
| FA2        | -9.1        | 1089.8      | -1.4      | -0.2 ± 0.1    | -1.2 ± 1.7          | -22.2 ± 8.8  | GA01463 |
| FA3        | -9.1        | 1377.5      | -1.2      | 0.5 ± 1.3     | 0.8 ± 2.6           | -17.0 ± 9.1  | GA01464 |
| FB1        | 1.6         | 1761.1      | -1.1      | -0.2 ± 0.1    | -1.2 ± 1.7          | -14.4 ± 10.3 | GA01465 |
| FB2        | 22.9        | 1345.5      | -1.0      | 0.5 ± 1.3     | 0.3 ± 2.4           | -24.0 ± 8.9  | GA01466 |
| FB3        | -9.1        | 1452.1      | -1.1      | -0.2 ± 0.1    | 1.3 ± 2.8           | -16.2 ± 9.1  | GA01467 |
| WA1A       | -9.1        | 120.1       | -1.1      | 0.5± 1.3      | -1.2 ± 1.7          | -20.0 ± 8.8  | GA01468 |
| WA2A       | -9.1        | 279.9       | -1.4      | -0.2 ± 0.1    | -1.2 ± 1.7          | -17.0 ± 9.1  | GA01469 |
| WA3A       | -9.1        | 56.1        | -1.1      | -0.2 ± 0.1    | -1.2 ± 1.7          | -17.5 ± 8.8  | GA01470 |
| WA1B       | 12.3        | 98.8        | 1.1       | 0.5 ± 1.3     | -0.7 ± 2.0          | -18.3 ± 8.9  | GA01471 |
| WA2B       | 1.6         | 141.4       | -1.1      | -0.2 ± 0.1    | -0.2 ± 2.2          | -16.3 ± 8.9  | GA01472 |
| WA3B       | -9.1        | -7.8        | -1.0      | 0.5 ± 1.3     | 2.8 ± 3.2           | -20.0 ± 8.8  | GA01473 |
| WB1A       | -9.1        | 1143.1      | -1.0      | -0.2 ± 0.1    | -1.2 ± 1.7          | -16.2 ± 9.1  | GA01474 |
| WB2A       | 12.3        | 184.0       | -1.0      | -0.2 ± 0.1    | 0.3 ± 2.4           | -18.7 ± 8.9  | GA01475 |
| WB1B       | 1.6         | -61.1       | -1.2      | 0.5± 1.3      | -0.2 ± 2.2          | -16.2 ± 9.1  | GA01476 |
| WB2B       | -9.1        | 194.7       | -1.2      | -0.2 ± 0.1    | 4.3± 3.6            | -19.1 ± 9.1  | GA01477 |
| WC1A       | 1.6         | -125.0      | -1.3      | -0.2 ± 0.1    | -1.2 ± 1.7          | -19.6 ± 8.8  | GA01478 |
| WC2A       | -9.1        | 130.7       | -1.4      | 0.5 ± 1.3     | 0.8 ± 2.6           | -17.7 ± 9.7  | GA01479 |
| WC3A       | -9.1        | 13.5        | -1.4      | -0.2 ± 0.1    | -0.2 ± 2.2          | -17.4 ± 9.3  | GA01480 |
| WC1B       | -9.1        | -50.4       | -1.4      | -0.2 ± 0.1    | -0.2 ± 2.2          | -21.7 ±8.6   | GA01481 |
| WC2B       | -9.1        | 184.0       | -1.5      | 0.5± 1.3      | 0.8± 2.6            | -20.4 ± 9.0  | GA01482 |
| WC3B       | 1.6         | -82.4       | -1.5      | -0.2 ± 0.1    | 0.3 ± 2.4           | -19.1 ± 8.9  | GA01483 |
| WD1A       | 12.3        | 152.0       | -1.5      | 0.5± 1.3      | 0.8 ± 2.6           | -22.1 ± 8.4  | GA01484 |
| WD2A       | -9.1        | -82.4       | -1.5      | 0.8± 1.5      | 0.1 ± 2.5           | -12.1 ± 9.3  | GA01485 |
| WD1B       | -9.1        | -29.1       | -1.5      | 0.8± 1.5      | -2.0 ± 1.2          | -15.3 ± 9.2  | GA01486 |
| WD2B       | -9.1        | 88.1        | -1.4      | 0.0 ± 0.0     | 1.2 ± 2.9           | -15.4 ± 9.0  | GA01487 |
| RSNK       | 1.6         | 2453.8      | -1.4      | 0.0 ± 0.0     | 0.1 ± 2.5           | -12.8 ± 8.8  | GA01488 |

C-23-1

|            |             | For         | t Meade, | Building 2805 ( | Room 10)            | ·              |         |
|------------|-------------|-------------|----------|-----------------|---------------------|----------------|---------|
| Location   |             | Monitoring  |          |                 | Wipe Test           |                | T       |
| Code       | Alpha       | Beta        | Gamma    | Alpha           | Beta                | LS             | Wipe    |
| (Units =>) | dpm/100cm^2 | dpm/100cm^2 | uR/hr    | dpi             | m/100cm^2 +/- 2 sig | ma             | Number  |
| (Bkgd =>)  | 1.7         | 149.47      | 5.00     | 0.3             | 2.0                 | 35.1           | 1       |
| (MDA =>)   | 54          | 401         | -        | 1.9             | 1.8                 | 40.0           | 1       |
| FA1        | 1.6         | 224.5       | -1.9     | 0.3 ± 1.1       | -0.7 ± 1.5          | ✓ -26.8 ± 10.3 | GA01603 |
| FA2        | -9.1        | 213.4       | -1.7     | -0.3 ± 0.2      | -0.3 ± 1.7          | -19.1 ± 20.9   | GA01604 |
| FA3        | -9.1        | 25.1        | -1.5     | -0.3 ± 0.2      | 1.4 ± 2.4           | -23.8 ± 10.3   | GA01605 |
| FA4        | -9.1        | 124.8       | -1.2     | -0.3 ± 0.2      | -0.3 ± 1.7          | -15.4 ± 13.5   | GA01606 |
| FB1        | 1.6         | 357.4       | -1.0     | -0.3 ± 0.2      | -0.3 ± 1.7          | -28.2 ± 12.8   | GA01607 |
| FB2        | -9.1        | 135.9       | -0.8     | 0.3 ± 1.1       | -0.3 ± 1.7          | -21.4 ± 10.5   | GA01608 |
| FB3        | -9.1        | 58.3        | -0.6     | -0.3 ± 0.2      | -0.3 ± 1.7          | -14.8 ± 17.9   | GA01609 |
| FB4        | -9.1        | 25.1        | -0.6     | -0.3 ± 0.2      | -0.7 ± 1.5          | -28.1 ± 11.6   | GA01610 |
| WA1A       | 1.6         | 102.6       | -0.8     | -0.3 ± 0.2      | 1.8 ± 2.5           | -22.9 ± 8.8    | GA01611 |
| WA2A       | 12.3        | 69.4        | -0.8     | 2.6 ± 2.5       | 6.0 ± 3.6           | -21.7 ± 8.9    | GA01612 |
| WA3A       | -9.1        | 113.7       | -0.8     | -0.3 ± 0.2      | 0.5 ± 2.1           | -21.3 ± 9.0    | GA01613 |
| WA4A       | 1.6         | 434.9       | -0.8     | 0.3 ± 1.1       | -0.7 ± 1.5          | -24.8 ± 9.1    | GA01614 |
| WA1B       | 1.6         | 102.6       | -0.8     | -0.3 ± 0.2      | 0.9± 2.2            | -34.1 ± 11.1   | GA01615 |
| WA2B       | -9.1        | 135.9       | -0.6     | 0.3 ± 1.1       | 0.9 ± 2.2           | -33.8 ± 10.3   | GA01616 |
| WA3B       | 1.6         | 58.3        | -0.6     | -0.3 ± 0.2      | 1.4 ± 2.4           | -26.7 ± 8.5    | GA01617 |
| WA4B       | -9.1        | 47.3        | -0.7     | 0.3 ± 1.1       | -0.7 ± 1.5          | -24.3 ± 8.9    | GA01618 |
| WB1A       | 12.3        | 158.0       | -0.8     | -0.3 ± 0.2      | 0.5 ± 2.1           | -21.3 ± 9.0    | GA01619 |
| WB2A       | 12.3        | 69.4        | -0.8     | 0.3 ± 1.1       | 1.8 ± 2.5           | -21.2 ± 8.8    | GA01620 |
| WB1B       | 1.6         | -141.0      | -0.9     | -0.3 ± 0.2      | 0.1± 1.9            | -24.8 ± 9.1    | GA01621 |
| WB2B       | 1.6         | 25.1        | -0.8     | -0.3 ± 0.2      | 1.8 ± 2.5           | -20.0 ± 9.1    | GA01622 |
| WC1A       | 12.3        | 113.7       | -1.0     | -0.3 ± 0.2      | 1.4 ± 2.4           | -18.3 ± 9.2    | GA01623 |
| WC2A       | 1.6         | 91.6        | -0.9     | -0.3 ± 0.2      | -0.7 ± 1.5          | -21.7 ± 8.9    | GA01624 |
| WC3A       | 12.3        | 3.0         | -0.8     | -0.3 ± 0.2      | 0.1 ± 1.9           | -25.8 ± 8.6    | GA01625 |
| WC4A       | 22.9        | 47.3        | -0.8     | 1.4 ± 2.0       | 2.2 ± 2.6           | -17.9 ± 9.3    | GA01626 |
| WC1B       | 1.6         | 25.1        | -1.0     | -0.3 ± 0.2      | -1.2 ± 1.2          | -24.6 ± 8.7    | GA01627 |
| WC2B       | 12.3        | 69.4        | -1.2     | -0.3 ± 0.2      | 0.5 ± 2.1           | -24.9 ± 8.4    | GA01628 |
| WC3B       | -9.1        | -74.6       | -0.9     | -0.3 ± 0.2      | 0.5 ± 2.1           | -18.3 ± 9.2    | GA01629 |
| WC4B       | 1.6         | -96.7       | -0.9     | 0.3 ± 1.1       | 3.5 ± 3.0           | -27.1 ± .8.4   | GA01630 |
| WD1A       | 1.6         | 335.3       | -0.7     | -0.3 ± 0.2      | -1.6 ± 0.9          | -25.4 ± 8.6    | GA01631 |
| WD2A       | -9.1        | -74.6       | -0.8     | -0.3 ± 0.2      | -0.3 ± 1.7          | -24.7 ± 8.9    | GA01632 |
| WD1B       | -9.1        | 58.3        | -0.8     | -0.3 ± 0.2      | 0.9 ± 2.2           | -21.3 ± 9.0    | GA01633 |
| WD2B       | 1.6         | 25.1        | -0.8     | -0.3 ± 0.2      | -0.3 ± 1.7          | -22.9 ± 8.8    | GA01634 |





|            | Fort Meade, Building 2813 (Room 1 - Floors) |             |        |                |                     |                                       |         |  |
|------------|---------------------------------------------|-------------|--------|----------------|---------------------|---------------------------------------|---------|--|
| Location   | 1                                           | Monitoring  |        |                | Wipe Test           | · · · · · · · · · · · · · · · · · · · |         |  |
| Code       | Alpha                                       | Beta        | Gamma  | Alpha          | Beta                | LS                                    | Wipe    |  |
| (Units =>) | dpm/100cm^2                                 | dpm/100cm^2 | uR/hr  | dpi            | m/100cm^2 +/- 2 sig | ma                                    | Number  |  |
| (Bkgd =>)  | 1.7                                         | 149.47      | 5.70   | 0.1            | 2.0                 | 23.5                                  | 1       |  |
| (MDA =>)   | 54                                          | 401         | -      | 2.3            | 2.4                 | 23.1                                  |         |  |
| FA4        | 12.3                                        | 235.6       | -0.3   | 0.9 ± 1.6      | 0.9 ± 2.2           | <b>∂</b> -25.1 ± 9.6                  | GA00001 |  |
| FA5        | -9.1                                        | 158.0       | -0.3   | 0.9 ± 1.6      | -0.3 ± 1.7          | -27.1 ± 9.2                           | GA00002 |  |
| FA6        | -9.1                                        | 302.0       | -0.3   | 0.3 ± 1.1      | 2.6 ± 2.8           | -24.3 ± 9.7                           | GA00003 |  |
| FA7        | 12.3                                        | 180.2       | -0.3   | 0.9± 1.6       | 2.6 ± 2.8           | -31.6 ± 9.6                           | GA00004 |  |
| FA8        | -9.1                                        | 346.3       | -0.3   | -0.2 ± 0.2     | 0.5 ± 2.1           | -26.0 ± 9.5                           | GA00005 |  |
| FA9        | -9.1                                        | 124.8       | -0.3   | -0.2 ± 0.2     | 0.5 ± 2.1           | -23.0 ± 10.0                          | GA00006 |  |
| FA10       | 1.6                                         | 14.0        | -0.5   | -0.2 ± 0.2     | 0.9 ± 2.2           | -27.7 ± 9.4                           | GA00007 |  |
| FA11       | -9.1                                        | 324.2       | -0.5   | 0.3 ± 1.1      | 0.5 ± 2.1           | -25.2 ± 9.9                           | GA00008 |  |
| FA12       | 12.3                                        | 146.9       | -0.5   | 0.3 ± 1.1      | 0.5 ± 2.1           | -21.7 ± 9.7                           | GA00009 |  |
| FA13       | 12.3                                        | 313.1       | -0.7   | 0.3 ± 1.1      | 0.5 ± 2.1           | -28.1 ± 9.4                           | GA00010 |  |
| FA14       | -9.1                                        | 268.8       | -0.7   | 0.3 ± 1.1      | 0.5 ± 2.1           | -30.2 ± 9.2                           | GA00011 |  |
| FA15       | -9.1                                        | 180.2       | -0.6   | 0.9 ± 1.6      | 1.4 ± 2.4           | -29.8 ± 9.7                           | GA00012 |  |
| FA16       | -9.1                                        | 146.9       | -0.4   | -0.2 ± 0.2     | 0.5 ± 2.1           | -28.6 ± 10.7                          | GA00013 |  |
| FA17       | · -9.1                                      | 191.3       | -0.3   | -0.2 ± 0.2     | 0.5 ± 2.1           | -30.5 ± 10.0                          | GA00014 |  |
| FB4        | 1.6                                         | 80.5        | -0.4   | -0.2 ± 0.2     | -0.3 ± 1.7          | -30.0 ± 10.0                          | GA00015 |  |
| FB5        | 1.6                                         | 25.1        | -0.3   | 0.3 ± 1.1      | 0.9 ± 2.2           | -24.7 ± 9.7                           | GA00016 |  |
| FB6        | -9.1                                        | 268.8       | -0.2   | -0.2 ± 0.2     | 0.9 ± 2.2           | -24.6 ± 9.4                           | GA00017 |  |
| FB7        | -9.1                                        | 246.6       | -0.2   | -0.2 ± 0.2     | 0.5 ± 2.1           | -32.2 ± 9.3                           | GA00018 |  |
| FB8        | -9.1                                        | 423.9       | -0.3   | -0.2 ± 0.2     | 0.5 ± 2.1           | -28.9 ± 9.3                           | GA00019 |  |
| FB9        | -9.1                                        | 169.1       | -0.4   | -0.2 ± 0.2     | -0.3 ± 1.7          | -31.1 ± 9.1                           | GA00020 |  |
| FB10       | 12.3                                        | 36.2        | -0.7   | 0.9± 1.6       | 0.1 ± 1.9           | <u>-27.2 ± 9.4</u>                    | GA00021 |  |
| FB11       | 12.3                                        | 191.3       | -0.9   | -0.2 ± 0.2     | 1.4 ± 2.4           | -24.3 ± 9.7                           | GA00022 |  |
| FB12       | -9.1                                        | 36.2        | -0.9   | 0.9± 1.6       | 0.5 ± 2.1           | -26.3 ± 9.3                           | GA00023 |  |
| FB13       | -9.1                                        | 246.6       | -0.7   | 0.9± 1.6       | -0.3 ± 1.7          | -27.2 ± 9.4                           | GA00024 |  |
| FB14       | -9.1                                        | 158.0       | -0.9   | -0.2 ± 0.2     | 1.8 ± 2.5           | -25.1 ± 9.6                           | GA00025 |  |
| FB15       | -9.1                                        | 202.3       | -0.7   | 0.3 ± 1.1      | 0.5 ± 2.1           | -26.4 ± 9.5                           | GA00026 |  |
| FB16       | -9.1                                        | 313.1       | -0.5   | -0.2 ± 0.2     | 0.9 ± 2.2           | -26.1 ± 9.8                           | GA00027 |  |
| FB17       | -9.1                                        | 368.5       | -0.5   | $0.3 \pm 1.1$  | 0.9 ± 2.2           | -22.6 ± 10.1                          | GA00028 |  |
| FC4        | -9.1                                        | 446.0       | -0.5   | $0.3 \pm 1.1$  | 0.5 ± 2.1           | -26.4 ± 9.5                           | GA00029 |  |
| FC5        | -9.1                                        | 124.8       | -0.4   | -0.2 ± 0.2     | 0.5 ± 2.1           | -27.2 ± 9.4                           | GA00030 |  |
| FC6        | -9.1                                        | 390.6       | -0.4   | 0.9 ± 1.6      | -1.2 ± 1.2          | -25.1 ± 9.6                           | GA00031 |  |
| FC7        | 1.6                                         | 257.7       | -0.4   | -0.2 ± 0.2     | -0.3 ± 1.7          | -23.8 ± 9.5                           | GA00032 |  |
| FC8        | -9.1                                        | 102.6       | -0.6   | -0.2 ± 0.2     | 0.9 ± 2.2           | -25.1 ± 9.6                           | GA00033 |  |
| FC9        | 1.6                                         | 14.0        | -1.0   | $0.3 \pm 1.1$  | $0.5 \pm 2.1$       | -24.2 ± 9.4                           | GA00034 |  |
| FC10       | -9.1                                        | 379.6       | -1.0   | $-0.2 \pm 0.2$ | -0.3 ± 1.7          | -23.3 ± 9.5                           | GA00035 |  |
| FC11       | -9.1                                        | 102.6       | -1.1   | -0.2 ± 0.2     | -0.7± 1.5           | -25.1 ± 9.6                           | GA00036 |  |
| FC12       | -9.1                                        | 412.8       | -1.1   | -0.2 ± 0.2     | $0.5 \pm 2.1$       | -31.1 ± 9.6                           | GA00037 |  |
| FC13       | -9.1                                        | 313.1       | -0.9   | -0.2 ± 0.2     | 3.5 ± 3.0           | -30.6 ± 9.1                           | GA00038 |  |
| FC14       | -9.1                                        | 102.6       | -1.0   | -0.2 ± 0.2     | 0.9 1 2.2           | -26.4 ± 9.5                           | GA00039 |  |
| FC15       | 1.6                                         | 235.6       | -1.0   | -0.2 ± 0.2     | 0.9 ± 2.2           | $-31.5 \pm 9.1$                       | GA00040 |  |
| FC16       | 12.3                                        | 30.2        |        | 0.9 I 1.0      | 2.21 2.0            | $-30.0 \pm 10.0$                      | GA00041 |  |
|            | 12.3                                        | 3/9.0       | -1.0   | -0.2 I 0.2     | 3.UI 2.9            | -20.3 I 9.0                           | GA00042 |  |
| FD1        | -9.1                                        | 230.0       | -0.2   | U.SI 1.1       | -U.SI 1./           | -20.1 # 9.0                           | GA00043 |  |
|            | -9.1                                        | 190.2       | -0.2   | 5.5 ± 5.0      | 301 30              | -21.3 1 9.9                           | GA00044 |  |
|            | 1.0                                         | 180.2       | -0.2   | -0.2 ± 0.2     | $1.0 \pm 2.9$       | -21.21 9.4                            | GA00045 |  |
|            | -9.1                                        | 269.9       | -0.3   | -0.2 ± 0.2     | 01+ 10              | -11.7 - 0.4                           | GA00040 |  |
| EDe        | -9.1                                        | 200.0       | -0.4   | -0.2 ± 0.2     | 0.1 1.3             | -153+ 0.2                             | GA00047 |  |
|            | -3.1                                        | 240.0       | -0.5   | -0.2 ± 0.2     | 0.3 2.2             | -17.8 + 0.0                           | GA00040 |  |
|            | 1.0                                         | 270.0       |        | -0.2 ± 0.2     | -03+ 17             | -121+ 97                              | GA00050 |  |
| IDFWINV    | -9.1                                        | 213.3       | 1 -0.4 | -0.2 1 0.2     | 1.0 - 1.7           | 1 -14-14 0.1                          | LOUGO O |  |

C-26-1

## rermination survey, ort Meade, MD, 11 Aug 97-23

|            |             | Fort Me     | eade, Bui | iding 2813 (Roo | om 1 - Floors)      |              |         |
|------------|-------------|-------------|-----------|-----------------|---------------------|--------------|---------|
| Location   |             | Monitoring  |           |                 | Wipe Test           | · · · · ·    |         |
| Code       | Alpha       | Beta        | Gamma     | Alpha           | Beta                | LS           | Wipe    |
| (Units =>) | dpm/100cm^2 | dpm/100cm^2 | uR/hr     | dpr             | m/100cm^2 +/- 2 sig | ma           | Number  |
| (Bkgd =>)  | 1.7         | 149.47      | 5.70      | 0.1             | 2.0                 | 23.5         | 1 ·.    |
| (MDA =>)   | 54          | 401         | -         | 2.3             | 2.4                 | 23.1         | 1       |
| FD8        | -9.1        | 291.0       | -0.5      | 0.3 ± 1.1       | 1.8 ± 2.5           | -24.1 ± 8.4  | GA00051 |
| FD9        | 1.6         | 324.2       | -0.3      | -0.2 ± 0.2      | -0.7 ± 1.5          | -15.2 ± 8.8  | GA00052 |
| FD10       | -9.1        | 279.9       | -0.5      | -0.2 ± 0.2      | 0.9 ± 2.2           | -12.6 ± 9.1  | GA00053 |
| FD11       | 1.6         | 191.3       | -0.5      | 0.3 ± 1.1       | 0.5 ± 2.1           | -14.9 ± 8.6  | GA00054 |
| FD12       | 1.6         | 213.4       | -0.5      | 0.3 ± 1.1       | 0.5 ± 2.1           | -17.8 ± 8.8  | GA00055 |
| FD13       | 1.6         | 324.2       | -0.6      | -0.2 ± 0.2      | 0.5 ± 2.1           | -18.6 ± 8.9  | GA00056 |
| FD14       | -9.1        | 158.0       | -1.0      | -0.2 ± 0.2      | 0.1 ± 1.9           | -13.7 ± 8.0  | GA00057 |
| FD15       | -9.1        | 80.5        | -1.3      | -0.2 ± 0.2      | -0.3 ± 1.7          | -11.5 ± 8.9  | GA00058 |
| FD16       | 12.3        | 135.9       | -1.3      | 0.9± 1.6        | -1.2 ± 1.2          | -15.0 ± 10.4 | GA00059 |
| FD17       | 1.6         | 279.9       | -0.9      | 0.3 ± 1.1       | 0.5 ± 2.1           | -20.0 ± 8.3  | GA00060 |
| FE1        | -9.1        | 379.6       | -0.8      | -0.2 ± 0.2      | 0.1 ± 1.9           | -18.6 ± 9.2  | GA00061 |
| FE2        | 1.6         | 158.0       | -0.6      | 0.3 ± 1.1       | 1.4 ± 2.4           | -21.3 ± 8.4  | GA00062 |
| FE3        | 1.6         | -41.3       | -0.3      | -0.2 ± 0.2      | -0.3 ± 1.7          | -13.8 ± 9.2  | GA00063 |
| FE4        | 9.1         | 91.6        | -0.4      | -0.2 ± 0.2      | 0.5 ± 2.1           | -14.8 ± 8.9  | GA00064 |
| FE5        | -9.1        | 291.0       | -0.3      | 0.3 ± 1.1       | 0.5 ± 2.1           | -21.3 ± 8.2  | GA00065 |
| FE6        | -9.1        | 291.0       | -0.4      | -0.2 ± 0.2      | 0.5 ± 2.1           | -19.1 ± 8.9  | GA00066 |
| FE7        | -9.1        | 357.4       | -0.5      | 0.3 ± 1.1       | -0.7 ± 1.5          | -13.6 ± 8.7  | GA00067 |
| FE8        | -9.1        | 268.8       | -0.5      | 0.3 ± 1.1       | -0.3 ± 1.7          | -14.0 ± 8.7  | GA00068 |
| FE9        | -9.1        | 235.6       | -0.7      | -0.2 ± 0.2      | -1.2 ± 1.2          | -15.1 ± 9.1  | GA00069 |
| FE10       | -9.1        | 202.3       | -0.9      | 0.3 ± 1.1       | 0.9 ± 2.2           | -15.3 ± 8.6  | GA00070 |
| FE11       | 1.6         | 158.0       | -0.8      | -0.2 ± 0.2      | 0.1 ± 1.9           | -16.5 ± 8.7  | GA00071 |
| FE12       | 1.6         | 213.4       | -0.8      | -0.2 ± 0.2      | -1.2 ± 1.2          | -20.9 ± 8.3  | GA00072 |
| FE13       | 1.6         | 302.0       | -0.6      | -0.2 ± 0.2      | 2.6 ± 2.8           | -17.8 ± 8.8  | GA00073 |
| FE14       | -9.1        | 357.4       | -0.6      | -0.2 ± 0.2      | 0.5 ± 2.1           | -14.7 ± 9.1  | GA00074 |
| FE15       | -9.1        | 268.8       | -0.6      | -0.2 ± 0.2      | 1.4 ± 2.4           | -13.2 ± 8.8  | GA00075 |
| FE16       | -9.1        | 58.3        | -0.7      | -0.2 ± 0.2      | -1.6 ± 0.9          | -17.0 ± 8.4  | GA00076 |
| FE17       | -9.1        | 169.1       | -0.8      | -0.2 ± 0.2      | -0.3 ± 1.7          | -13.0 ± 9.0  | GA00077 |
| FE18       | -9.1        | -8.1        | -0.8      | 0.3 ± 1.1       | 0.1 ± 1.9           | -13.6 ± 8.7  | GA00078 |
| FE19       | 1.6         | 158.0       | -1.0      | 0.9 ± 1.6       | -0.7 ± 1.5          | -21.7 ± 8.2  | GA00079 |
| FE20       | -9.1        | 124.8       | -0.4      | -0.2 ± 0.2      | 0.5 ± 2.1           | -16.5 ± 8.7  | GA00080 |
| FF1        | -9.1        | 91.6        | -0.4      | -0.2 ± 0.2      | $-0.3 \pm 1.7$      | -13.6 ± 8.7  | GA00081 |
| FF2        | -9.1        | 202.3       | -0.4      | -0.2 ± 0.2      | 0.9 ± 2.2           | -18.2 ± 8.8  | GA00082 |
| FF3        | -9.1        | 135.9       | -0.2      | -0.2 ± 0.2      | 0.5 ± 2.1           | -17.0 ± 8.4  | GA00083 |
| FF4        | -9.1        | 124.8       | -0.3      | $-0.2 \pm 0.2$  | 0.9 ± 2.2           | -16.5 ± 8.7  | GA00084 |
| FF5        | -9.1        | 158.0       | -0.2      | -0.2 ± 0.2      | 3.5 ± 3.0           | -19.6 ± 8.2  | GA00085 |
| FF6        | -9.1        | 113.7       | -0.3      | 0.3 ± 1.1       | 0.9± 2.2            | -19.6 ± 8.2  | GA00086 |
| FF7        | 1.6         | 91.6        | -0.4      | -0.2 ± 0.2      | -0.7 ± 1.5          | -17.9± 8.3   | GA00087 |
| FF8        | 1.6         | 135.9       | -0.5      | -0.2 ± 0.2      | -0.7 ± 1.5          | -12.3 ± 8.9  | GA00088 |
| FF9        | -9.1        | 268.8       | -0.7      | 0.3 ± 1.1       | -0.7 ± 1.5          | -20.4 ± 8.1  | GA00089 |
| FF10       | -9.1 ····   | 235.6       | -0.3      | -0.2 ± 0.2      | -0.7 ± 1.5          | -16.5 ± 8.7  | GA00090 |
| FF11       | 9.1         | 191.3       | -0.4      | -0.2 ± 0.2      | 0.9 ± 2.2           | -11.4 ± 8.7  | GA00091 |
| FF12       | -9.1        | 246.6       | -0.3      | -0.2 ± 0.2      | 0.1 ± 1.9           | -10.5 ± 8.8  | GA00092 |
| IFF13      | -9.1        | 324.2       | -0.1      | -0.2 ± 0.2      | -0.3 ± 1.7          | -14.8 ± 7.9  | GA00093 |
| IFF14      | 1.6         | 146.9       | 0.0       | -0.2 ± 0.2      | 0.5 ± 2.1           | -14.5 ± 8.4  | GA00094 |
| FF15       | -9.1        | 512.5       | -0.1      | -0.2 ± 0.2      | 3.0 ± 2.9           | -10.0 ± 8.4  | GA00095 |
| FF16       | 1.6         | 246.6       | -0.5      | -0.1 ± 0.1      | 2.5 ± 3.4           | -10.2 ± 8.2  | GA00096 |
| FF17       | -9.1        | 368.5       | -0.5      | -0.1 ± 0.1      | -0.2 ± 2.5          | -11.3 ± 8.3  | GA00097 |
| FF18       | -9.1        | -19.2       | -0.5      | -0.1 ± 0.1      | 0.8 ± 2.9           | -16.1 ± 7.8  | GA00098 |
| FF19       | -9.1        | 279.9       | -0.6      | -0.1 ± 0.1      | 3.0 ± 3.6           | -10.4 ± 8.3  | GA00099 |
| BLANK      | -9.1        | 113.7       | -0.7      | -0.1 ± 0.1      | 0.8 ± 2.9           | -10.2 ± 7.8  | GA00100 |

C-26-2

|                  | T          | Maple-J |               |                |                     |                    |          |
|------------------|------------|---------|---------------|----------------|---------------------|--------------------|----------|
| Location<br>Code | Monitoring |         | 0             | A 1 L .        | Wipe Test           |                    |          |
|                  | Alpha      | Beta    | Gamma         | Alpha          | Beta                | LS                 | Number   |
|                  | 4 7        | 140.47  | uronr<br>6.70 |                | m/100cm^2 +/- 2 sig | jma<br>Landa and a |          |
|                  | 54         | 149.47  | 5.70          | 0.1            | 2.0                 | 23.5               | <b>.</b> |
| MDA =>)          | 0.1        | 401     |               | 2.3            | 2.4                 | 23.1               | -        |
| F20              | -9.1       | 235.6   | -0.8          | $-0.1 \pm 0.1$ | -0.8 ± 2.2          | -6.8 ± 8.5         | GA00101  |
| -G1              | -9.1       | 240.0   | -1.1          | $0.7 \pm 1.5$  | 3.0 ± 3.6           | -17.7 ± 8.0        | GA00102  |
| -G2              | -9.1       | 135.9   | 0.7           | $0.7 \pm 1.5$  | $0.3 \pm 2.7$       | -10.2 ± 9.0        | GA00103  |
| -63              | -9.1       | 235.0   | -0.8          | $-0.1 \pm 0.1$ | $-1.9 \pm 1.6$      | -11.1 ± 8.1        | GA00104  |
| -64              | -9.1       | 335.3   | -0.7          | $-0.1 \pm 0.1$ | 2.5 ± 3.4           | $-12.3 \pm 8.0$    | GA00105  |
| -65              | -9.1       | 224.3   | -0.7          | $-0.1 \pm 0.1$ | $-1.9 \pm 1.6$      | $-10.4 \pm 8.3$    | GA00106  |
| -66              | -9.1       | 156.0   | -0.7          | $-0.1 \pm 0.1$ | 0.8 ± 2.9           | -7.6± 8.8          | GA00107  |
| -67              | 1.0        | 124.0   | -0.5          | -0.1 ± 0.1     | $0.3 \pm 2.7$       | $-14.3 \pm 7.9$    | GA00108  |
| -68              | 1.0        | 240.0   | -0.6          | $-0.1 \pm 0.1$ | -0.8 ± 2.2          | -11.7 ± 8.2        | GA00109  |
| -69              | -9.1       | 240.0   | -0.4          | U./ I 1.5      | U.8 ± 2.9           | -15.2 ± 7.9        | GA00110  |
| -610             | -9.1       | -/4.0   | -0.7          | -0.1 ± 0.1     | $0.3 \pm 2.7$       | -10.9 ± 8.7        | GA00111  |
| -611             | -9.1       | 25/./   | -0./          | $-0.1 \pm 0.1$ | -0.2 ± 2.5          | -15.8 ± 8.4        | GA00112  |
| -G12<br>-G12     | 1.0.       | 30.2    | -0.7          | -0.1 ± 0.1     | $0.3 \pm 2.7$       | $-13.2 \pm 9.2$    | GA00113  |
| -013             | -9.1       | 340.3   | -0.7          | -0.1 ± 0.1     | -1.9± 1.6           | $-13.3 \pm 8.3$    | GA00114  |
| -014<br>         | -9.1       | 240.0   | -0.0          | 0.1 1 0.1      | 1.4 1 3.1           | -14.5 ± 8.4        | GAU0115  |
| -015<br>-015     | -9.1       | 159.0   | -0./          |                | -U.ZI 2.0           | -12.0 ± 8.1        | GA00116  |
| G10              | 12.1       | 257 7   | -0.0          | -0.1 2 0.1     | U.3 I 2./           | -13.6 ± /.8        | GA00117  |
| -G17             | -0.1       | 237.7   | -0.7          | -0.1± 0.1      | 0.3 ± 2.7           | -10.2 ± 9.5        | GA00118  |
| -G10             | -9.1       | 335.3   | -0.7          | -0.1 ± 0.1     | -1.9 ± 1.0          | -15.8 ± 8.4        | GA00119  |
| -G19<br>-G20     | -9.1       | 246.6   | -0.0          | -0.1 ± 0.1     | $0.3 \pm 2.7$       | -12.9 ± 8.3        | GA00120  |
| -G20<br>         | -9.1       | 213.4   | -0.0          | $-0.1 \pm 0.1$ | $10 \pm 2.9$        | -13.5 ± 8.0        | GA00121  |
| сно<br>сно       | -9.1       | 324.2   | 0.0           | -0.1 ± 0.1     | $1.5 \pm 3.3$       | -14.9 I 0.0        | GA00122  |
| FH3              | -9.1       | 102.6   | 0.0           | -0.1 ± 0.1     | $1.4 \pm 3.1$       | -10.0 ± 0.2        | GA00123  |
| FHA              | -9.1       | 69.4    | 0.1           | 07+ 15         | 0.31 2.7            | -12.0 ± 7.9        | GA00124  |
| FH5              | -9.1       | 291.0   | 0.1           | 07+ 15         | 10+ 33              | -0.5 1 0.0         | GA00125  |
| FH6              | -91        | 335.3   | 0.3           | 07+ 15         | 03+ 27              | -20.0 + 8.2        | GA00120  |
| FH7              | 16         | 91.6    | 0.3           | -01+01         | -19+ 16             | -20.01 0.2         | GA00127  |
| FH8              | -9.1       | -19.2   | 0.3           | -01+ 01        | 19+ 33              | -149+ 86           | GA00129  |
| FH9              | -9.1       | -229.7  | 0.1           | 07+ 15         | 0.8 + 2.9           | -155+ 83           | GA00130  |
| FH10             | -9.1       | 47.3    | -0.3          | -0.1 ± 0.1     | 1.9 ± 3.3           | -132+ 79           | GA00131  |
| FH11             | -9.1       | 401.7   | -0.3          | -0.1 ± 0.1     | 1.9± 3.3            | -14.8 + 7.9        | GA00132  |
| FH12             | -9.1       | 423.9   | -0.2          | -0.1 ± 0.1     | -1.3 ± 1.9          | -10.5 ± 9.8        | GA00133  |
| FH13             | -9.1       | 146.9   | -0.1          | -0.1 ± 0.1     | 8.5 ± 4.9           | -13.8 ± 8.2        | GA00134  |
| FH14             | -9.1       | 146.9   | -0.1          | -0.1 ± 0.1     | -1.9 ± 1.6          | -15.5 ± 8.3        | GA00135  |
| FH15             | -9.1       | 357.4   | 0.1           | -0.1 ± 0.1     | 2.5 ± 3.4           | -14.3 ± 8.6        | GA00136  |
| FH16             | -9.1       | -19.2   | -0.1          | -0.1 ± 0.1     | 1.4 ± 3.1           | -14.2 ± 8.2        | GA00137  |
| FH17             | ·-9.1      | 291.0   | -0.1          | 0.7 ± 1.5      | 0.3 ± 2.7           | -13.6 ± 92         | GA00138  |
| FH18             | -9.1       | -130.0  | 0.1           | -0.1 ± 0.1     | 3.0 ± 3.6           | -18.2 ± 87         | GA00139  |
| FH19             | -9.1       | 3.0     | 0.1           | -0.1 ± 0.1     | 1.4 ± 3.1           | -13.2 + 8.5        | GA00140  |
| FH20             | -9.1       | -307.2  | 0.0           | -0.1 ± 0.1     | -1.3 ± 1.9          | -14.7 ± 8.8        | GA00141  |
| FI1.             | -9.1       | -19.2   | 0.0           | -0.1 ± 0.1     | 1.9 ± 3.3           | -16.3 ± 9.2        | GA00142  |
| FI2              | -9.1       | 80.5    | -0.3          | 2.1 ± 2.3      | 4.7 ± 3.3           | $-20.0 \pm 9.0$    | GA00143  |
| F13              | -9.1       | 202.3   | -0.3          | -0.2 ± 0.2     | -0.3 ± 1.7          | -13.2 ± 8.5        | GA00144  |
| FI4              | -9.1       | 146.9   | -0.4          | 0.9 ± 1.6      | 1.4 ± 2.4           | $-16.2 \pm 8.3$    | GA00145  |
| F15              | -9.1       | 224.5   | -0.1          | 3.8 ± 3.0      | 2.2 ± 2.6           | -12.9 ± 9.0        | GA00146  |
| F16              | 1.6        | 313.1   | 0.0           | 0.3 ± 1.1      | 0.1 ± 1.9           | -17.3 ± 8.6        | GA00147  |
| F17              | -9.1       | 324.2   | 0.1           | -0.2 ± 0.2     | 1.4 ± 2.4           | -18.3 ± 8.0        | GA00148  |
| FI8              | -9.1       | 446.0   | 0.0           | 0.3 ± 1.1      | $2.2 \pm 2.6$       | -13.5 + 9.4        | GA00140  |
|                  |            | 58.3    | 0.1           | 09+ 16         | -03+ 17             | -106+ 77           | GA00150  |

HOLDBRIDE

C-26-3

Spage of a system of the providence of the activity of a system of the activity of the system of the same information of the system of the



| Fort Meade, Building 2813 (Room 1 - Floors) |             |             |       |            |                     |             |         |
|---------------------------------------------|-------------|-------------|-------|------------|---------------------|-------------|---------|
| Location                                    | Monitoring  |             |       |            | Wipe Test           |             |         |
| Code                                        | Alpha       | Beta        | Gamma | Alpha      | Beta                | LS          | Wipe    |
| (Units =>)                                  | dpm/100cm^2 | dpm/100cm^2 | uR/hr | dpı        | m/100cm^2 +/- 2 sig | ma          | Number  |
| (Bkgd =>)                                   | 1.7         | 149.47      | 5.70  | . 0.1      | 2.0                 | 23.5        | 1       |
| (MDA =>)                                    | 54          | 401         | •     | 2.3        | 2.4                 | 23.1        | 1 .     |
| FI9                                         | -9.1        | 390.6       | -0.5  | 0.9± 1.6   | 3.0 ± 2.9           | -13.8 ± 9.7 | GA00151 |
| FI10                                        | 1.6         | -107.8      | -0.3  | 2.1 ± 2.3  | 4.3 ± 3.2           | -17.2 ± 9.1 | GA00152 |
| FI11                                        | -9.1        | 412.8       | -0.2  | -0.2 ± 0.2 | 1.8 ± 2.5           | -15.9 ± 8.9 | GA00153 |
| FI12                                        | 1.6         | 357.4       | -0.1  | 0.3 ± 1.1  | -0.3 ± 1.7          | -13.8 ± 9.7 | GA00154 |
| FI13                                        | -9.1        | 3.0         | 0.0   | -0.2 ± 0.2 | 1.4 ± 2.4           | -12.6 ± 8.8 | GA00155 |
| FI14                                        | -9.1        | 69.4        | 0.2   | -0.2 ± 0.2 | 1.4 ± 2.4           | -15.3 ± 8.3 | GA00156 |
| F115                                        | 1.6         | 235.6       | 0.3   | 0.3 ± 1.1  | 1.8 ± 2.5           | -17.1 ± 8.0 | GA00157 |
| FI16                                        | -9.1        | 191.3       | 0.3   | 0.3 ± 1.1  | 2.2 ± 2.6           | -11.9 ± 8.7 | GA00158 |
| FI17                                        | -9.1        | -185.4      | 0.3   | -0.2 ± 0.2 | -0.3 ± 1.7          | -15.3 ± 9.3 | GA00159 |
| F118                                        | -9.1        | -118.9      | 0.1   | -0.2 ± 0.2 | -1.6 ± 0.9          | -14.7 ± 8.8 | GA00160 |
| FI19                                        | -9.1        | -52.4       | -0.1  | 0.3 ± 1.1  | 0.5 ± 2.1           | -9.8 ± 8.9  | GA00161 |
| F120                                        | -9.1        | 135.9       | -0.2  | 0.9± 1.6   | -0.7 ± 1.5          | -18.7 ± 8.2 | GA00162 |

| Fort Meade, Building 2813 (Room 1 - Walls) |             |             |          |                |                     |              |          |  |  |
|--------------------------------------------|-------------|-------------|----------|----------------|---------------------|--------------|----------|--|--|
| Location                                   |             | Monitoring  |          | Wipe Test      |                     |              |          |  |  |
| Code                                       | Alpha       | Beta        | Gamma    | Alpha          | Beta                | LS           | Wipe     |  |  |
| (Units =>)                                 | dpm/100cm^2 | dpm/100cm^2 | uR/hr    | dp             | m/100cm^2 +/- 2 sig | ma           | Number   |  |  |
| (Bkgd =>)                                  | 1.7         | 149.47      | 5.00     | 0.1            | 2.0                 | 25.7         | 1        |  |  |
| (MDA =>)                                   | 54          | 401         | -        | 2.3            | 2.4                 | 33.0         |          |  |  |
| WE2A                                       | 1.6         | 291.0       | -1.4     | -0.1 ± 0.1     | -1.9 ± 1.6          | -17.5 ± 8.4  | GA00213  |  |  |
| WE3A                                       | 1.6         | 324.2       | -1.0     | -0.1 ± 0.1     | -1.3 ± 1.9          | -17.5 ± 8.4  | GA00214  |  |  |
| WE4A                                       | 1.6         | 279.9       | -0.9     | ~0.1 ± 0.1     | -0.2 ± 2.5          | -15.4 ± 8.6  | GA00215  |  |  |
| WE5A                                       | 22.9        | 191.3       | -0.6     | 0.7 ± 1.5      | -0.8 ± 2.2          | -18.3 ± 8.3  | GA00216  |  |  |
| WE6A                                       | 1.6         | 213.4       | -0.6     | -0.1 ± 0.1     | 0.3 ± 2.7           | -17.0 ± 8.7  | GA00217  |  |  |
| WE1B                                       | 12.3        | 324.2       | -0.8     | -0.1 ± 0.1     | 0.8 ± 2.9           | -15.4 ± 8.6  | GA00218  |  |  |
| WE2B                                       | -9.1        | 158.0       | -1.1     | -0.1 ± 0.1     | 1.4 ± 3.1           | -19.2 ± 8.2  | GA00219  |  |  |
| WE3B                                       | -9.1        | 80.5        | -1.3     | -0.1 ± 0.1     | -2.4 ± 1.2          | -12.9 ± 8.8  | GA00220  |  |  |
| WE4B                                       | 1.6         | 135.9       | 2.0      | -0.1 ± 0.1     | -0.8 ± 2.2          | -15.8 ± 8.6  | GA00221  |  |  |
| WE5B                                       | -9.1        | 279.9       | 6.6      | -0.1 ± 0.1     | 0.3 ± 2.7           | -19.6 ± 8.2  | GA00222  |  |  |
| WE6B                                       | -9.1        | 379.6       | 0.3      | 0.7 ± 1.5      | 0.3 ± 2.7           | -24.2 ± 10.4 | GA00223  |  |  |
| WF1A                                       | 1.6         | 158.0       | 0.1      | $-0.1 \pm 0.1$ | $2.5 \pm 3.4$       | -17.0 + 8.7  | GA00224  |  |  |
| WF2A                                       | 1.6         | -41.3       | 0.1      | 0.7 ± 1.5      | $2.5 \pm 3.4$       | -204 + 83    | GA00225  |  |  |
| WF3A                                       | 12.3        | 91.6        | 0.0      | -0.1 ± 0.1     | 0.3± 2.7            | -217+ 87     | GA00226  |  |  |
| WF4A                                       | -9.1        | 291.0       | 0.1      | $-0.2 \pm 0.1$ | 01+ 21              | -196+ 89     | GA00227  |  |  |
| WF1B                                       | 1.6         | 291.0       | -0.1     | $1.6 \pm 2.0$  | 27+ 29              | -213+ 88     | GA00228  |  |  |
| WF2B                                       | 1.6         | 357.4       | -0.1     | 04+ 11         | 18+ 26              | -255+ 86     | GA00229  |  |  |
| WF3B                                       | -9.1        | 268.8       | -0.1     | -02+ 01        | -07+ 17             | -20.8 + 8.8  | GA00220  |  |  |
| WF4B                                       | -9.1        | 235.6       | 0.1      | 10+ 16         | 10+ 24              | -263+ 111    | GA00231  |  |  |
| WG1A                                       | -9.1        | 202.3       | 0.4      | 04+ 11         | -15+ 12             | -21.3 + 8.8  | GA00232  |  |  |
| WG2A                                       | -9.1        | 158.0       | 0.4      | 04+ 11         | 22+ 28              | -196+ 89     | GA00232  |  |  |
| WG3A                                       | -9.1        | 213.4       | 0.3      | $10 \pm 16$    | 01+ 21              | -17.1 + 9.1  | GA00234  |  |  |
| WG4A                                       | 1.6         | 302.0       | 0.0      | $-0.2\pm 0.1$  | -07± 17             | -217+ 87     | GA00235  |  |  |
| WG1B                                       | 22.9        | 357.4       | 0.0      | 0.4 ± 1.1      | -03+ 19             | -20.0 + 8.9  | GA00236  |  |  |
| WG2B                                       | -9.1        | 268.8       | 0.0      | $0.4 \pm 1.1$  | 10+ 24              | -217+ 87     | GA00237  |  |  |
| WG3B                                       | 1.6         | 58.3        | -0.1     | 0.4 ± 1.1      | $-0.7 \pm 1.7$      | -20.0 ± 8.9  | GA00238  |  |  |
| WG4B                                       | -9.1        | 169.1       | 0.7      | 0.4 ± 1.1      | 0.1 ± 2.1           | -16.3 ± 9.2  | GA00239  |  |  |
| WH1A                                       | 1.6         | -8.1        | 0.4      | 1.0 ± 1.6      | 1.8± 2.6            | -22.5 ± 8.6  | GA00240  |  |  |
| WH2A                                       | 1.6         | 158.0       | 0.4      | -0.2 ± 0.1     | -1.5± 1.2           | -217 ± 87    | GA00241  |  |  |
| WH3A                                       | 1.6         | 124.8       | 0.6      | $-02\pm 0.1$   | -11+ 15             | -188+ 90     | GA00242  |  |  |
| WH4A                                       | 1.6         | 91.6        | 0.4      | $-0.2\pm 0.1$  | 14+ 25              | -217+ 87     | GA00243  |  |  |
| WH1B                                       | -9.1        | 202.3       | 0.3      | $-0.2\pm0.1$   | -11+ 15             | 20.0 + 8.9   | GA00244  |  |  |
| WH2B                                       | -9.1        | 135.9       | 0.2      | -02+ 01        | 18+ 26              | -171+ 91     | GA00245  |  |  |
| WH3B                                       | -9.1        | 124.8       | 0.1      | -0.2 ± 0.1     | 01+ 21              | -20.8 + 8.8  | GA00246  |  |  |
| WH4B                                       | -9.1        | 158.0       | 0.1      | -0.2 ± 0.1     | -11+ 15             | -183+ 90     | GA00247  |  |  |
| WIIA                                       | 1.6         | 113.7       | 0.1      | $10 \pm 16$    | -0.3+ 1.9           | -10.5 1 9.0  | GA00247  |  |  |
| WI2A                                       | -9.1        | 91.6        | 0.3      | -0.2 + 0.1     | -15+ 12             | -23.9 + 8.5  | GA00240  |  |  |
| QA                                         | N/A         | N/A         | N/A      | -0.2 + 0.1     | 01+ 21              | -23.01 0.3   | GA00250  |  |  |
| WI3A                                       | 1.6         | 268.8       | 0.0      | 04+ 11         | $-0.7 \pm 1.7$      | -20.4 + 0.0  | GA00250  |  |  |
| WI4A                                       | 12.3        | 235.6       | 0.3      | -0.2+ 0.1      | 18+ 26              | -25.0 + 9.4  | GA00257  |  |  |
| WI5A                                       | 16          | 191.3       | 01       | -0.2+ 0.1      | -03+ 10             | -23.0 1 0.4  | GA00252  |  |  |
| WIGA                                       | -91         | 246.6       | 0.1      | -0.2+0.1       | 14+ 25              | -221 + 0.0   | GA00253  |  |  |
| WI7A                                       | -91         | 324.2       | 03       | -0.2 ± 0.1     | -03+ 10             | -22.1 I 0.1  | GA00255  |  |  |
| WIBA                                       | -9.1        | 146.9       | 0.0      | -0.2 + 0.1     | _03± 40             | -23.0 I 0.3  | GA00255  |  |  |
| WIGA                                       | 12 3        | 512.5       | 0.0<br>1 | -0.2 1 0.1     | -U.JI 1.8           | -10.3 I 9.2  | GA00257  |  |  |
| WI10A                                      | -01         | 246.6       | 0.1      | -0.2 ± 0.1     | 1.4 I 2.0           | -20.0 I 0.3  | GA00257  |  |  |
| W/111A                                     |             | 368.5       | 0.5      |                | -U.JI 1.9           | -2U.UI 8.9   | GA00258  |  |  |
| W/112A                                     | 1.6         | - 10.0      | 0.1      | -0.2 I U.I     | -U./I 1./           | -10.2 ± 9.4  | GA00259  |  |  |
| WI13A                                      | -01         | 270 0       | 0.5      | -0.2 ± 0.1     | -1.JI 1.2           | -10.0 I 9.4  | GA00260  |  |  |
| V/11.3/\                                   |             | 1127        | 0.2      | $-0.2 \pm 0.1$ | 2.21 2.8            | -22.1 1 8.9  | GA00261  |  |  |
| WI14A                                      | 1.6         | 113.7       | 0.3      | -0.2 ± 0.1     | -0.3 ± 1.9          | -22.1 ± 8.7  | IGA00262 |  |  |

C-27-2

| Fort Meade, Building 2813 (Room 1 - Walls) |                      |             |       |                |                     |                      |         |  |
|--------------------------------------------|----------------------|-------------|-------|----------------|---------------------|----------------------|---------|--|
| Location                                   | Monitoring Wipe Test |             |       |                |                     |                      |         |  |
| Code                                       | Alpha                | Beta        | Gamma | Alpha          | Beta                | LS                   | Wipe    |  |
| (Units =>)                                 | dpm/100cm^2          | dpm/100cm^2 | uR/hr | dpi            | m/100cm^2 +/- 2 sig | ma                   | Number  |  |
| (Bkgd =>)                                  | 1.7                  | 149.47      | 5.00  | 0.1            | 2.0                 | 25.7                 | 1       |  |
| (MDA =>)                                   | 54                   | 401         | •     | 2.3            | 2.4                 | 33.0                 | 1       |  |
| WA1A                                       | -9.1                 | 235.6       | -0.5  | 0.9± 1.6       | 2.6 ± 2.8           | <b>√</b> -16.3 ± 8.0 | GA00163 |  |
| WA2A                                       | 12.3                 | 158.0       | -0.6  | -0.2 ± 0.2     | -0.3 ± 1.7          | -16.3 ± 8.0          | GA00164 |  |
| WA3A                                       | 1.6                  | 302.0       | -0.5  | -0.2 ± 0.2     | -2.0 ± 0.4          | -13.2 ± 8.5          | GA00165 |  |
| WA4A                                       | 1.6                  | 180.2       | -0.6  | -0.2 ± 0.2     | 1.4 ± 2.4           | -10.0 ± 8.6          | GA00166 |  |
| WA5A                                       | 1.6                  | 346.3       | -0.9  | -0.2 ± 0.2     | 0.5 ± 2.1           | -13.6 ± 8.5          | GA00167 |  |
| WA6A                                       | 12.3                 | 124.8       | -0.9  | -0.2 ± 0.2     | 0.1 ± 1.9           | -12.5 ± 8.4          | GA00168 |  |
| WA7A                                       | 1.6                  | 14.0        | -0.9  | -0.2 ± 0.2     | -0.3 ± 1.7          | -14.7 ± 8.8          | GA00169 |  |
| WA8A                                       | -9.1                 | 324.2       | -1.1  | 0.3 ± 1.1      | 0.1 ± 1.9           | -10.4 ± 8.6          | GA00170 |  |
| WA9A                                       | -9.1                 | 146.9       | -0.7  | -0.2 ± 0.2     | 1.4 ± 2.4           | -17.1 ± 8.0          | GA00171 |  |
| WA10A                                      | 1.6                  | 313.1       | -0.9  | -0.2 ± 0.2     | -0.7 ± 1.5          | -12.1 ± 8.4          | GA00172 |  |
| WA11A                                      | -9.1                 | 268.8       | -0.7  | 0.3 ± 1.1      | -0.7 ± 1.5          | -17.5 ± 7.9          | GA00173 |  |
| WA12A                                      | -9.1                 | 180.2       | -0.6  | -0.2 ± 0.2     | 1.4 ± 2.4           | -15.7 ± 8.3          | GA00174 |  |
| WA13A                                      | 1.6                  | 146.9       | -0.7  | -0.2 ± 0.2     | -0.3 ± 1.7          | -17.4 ± 8.1          | GA00175 |  |
| WA14A                                      | 22.9                 | 191.3       | -0.7  | 0.3 ± 1.1      | 2.6 ± 2.8           | -12.8 ± 8.6          | GA00176 |  |
| WA1B                                       | 1.6                  | 80.5        | -0.9  | 0.3 ± 1.1      | -0.7 ± 1.5          | -14.9 ± 8.4          | GA00177 |  |
| WA2B                                       | -9.1                 | 25.1        | -0.5  | 0.9 ± 1.6      | 1.4 ± 2.4           | -31.2 ± 15.4         | GA00178 |  |
| WA3B                                       | -9.1                 | 268.8       | -0.4  | -0.2 ± 0.2     | -0.3 ± 1.7          | -14.9 ± 8.4          | GA00179 |  |
| WA4B                                       | 1.6                  | 246.6       | -0.7  | -0.1 ± 0.1     | 0.3 ± 2.7           | -12.9 ± 8.4          | GA00180 |  |
| WA5B                                       | 1.6                  | 423.9       | -0.8  | 1.5 ± 2.2      | -0.2 ± 2.5          | -32.0 ± 13.1         | GA00181 |  |
| WA6B                                       | -9.1                 | 169.1       | -0.7  | -0.1 ± 0.1     | -1.9 ± 1.6          | -20.9 ± 8.3          | GA00182 |  |
| WA7B                                       | 1.6                  | 36.2        | -0.6  | 0.7 ± 1.5      | -2.4 ± 1.2          | -17.0 ± 8.7          | GA00183 |  |
| WA8B                                       | -9.1                 | 191.3       | -0.6  | -0.1 ± 0.1     | 1.4 ± 3.1           | -29.2 ± 10.3         | GA00184 |  |
| WA9B                                       | 1.6                  | 36.2        | -0.8  | -0.1 ± 0.1     | -2.4 ± 1.2          | -18.8 ± 8.3          | GA00185 |  |
| WA10B                                      | 1.6                  | 246.6       | -0.8  | -0.1 ± 0.1     | -0.8 ± 2.2          | -16.2 ± 8.7          | GA00186 |  |
| WA11B                                      | 1.6                  | 158.0       | -0.8  | -0.1 ± 0.1     | 0.3 ± 2.7           | -18.7 ± 8.5          | GA00187 |  |
| WA12B                                      | -9.1                 | 202.3       | -0.5  | -0.1 ± 0.1     | -1.9 ± 1.6          | -20.0 ± 8.4          | GA00188 |  |
| WA13B                                      | -9.1                 | 313.1       | -0.4  | -0.1 ± 0.1     | -0.8 ± 2.2          | -17.4 ± 8.6          | GA00189 |  |
| WA14B                                      | 1.6                  | 368.5       | -0.5  | -0.1 ± 0.1     | 1.9 ± 3.3           | -19.6 ± 8.2          | GA00190 |  |
| WB1A                                       | -9.1                 | 446.0       | -0.4  | -0.1 ± 0.1     | 0.8 ± 2.9           | -20.4 ± 8.1          | GA00191 |  |
| WB2A                                       | 12.3                 | 124.8       | -0.3  | -0.1 ± 0.1     | -0.2 ± 2.5          | -16.7 ± 8.5          | GA00192 |  |
| WB3A                                       | -9.1                 | 390.6       | -0.4  | -0.1 ± 0.1     | -0.2 ± 2.5          | -21.3 ± 8.5          | GA00193 |  |
| WB1B                                       | -9.1                 | 257.7       | -0.3  | 0.7 ± 1.5      | 4.7 ± 4.0           | -15.4 ± 8.6          | GA00194 |  |
| WB2B                                       | -9.1                 | 102.6       | -0.4  | -0.1 ± 0.1     | $2.5 \pm 3.4$       | -15.4 ± 8.6          | GA00195 |  |
| WB3B                                       | 1.6                  | 14.0        | -0.4  | -0.1 ± 0.1     | 0.3 ± 2.7           | -12.8 ± 9.1          | GA00196 |  |
| WC1A                                       | 12.3                 | 379.6       | -0.4  | -0.1 ± 0.1     | 0.3 ± 2.7           | -12.5 ± 8.9          | GA00197 |  |
| WC2A                                       | 1.6                  | 102.6       | -0.4  | -0.1 ± 0.1     | 0.8 ± 2.9           | -15.8 ± 8.6          | GA00198 |  |
| WC1B                                       | 22.9                 | 412.8       | -0.6  | -0.1 ± 0.1     | 0.3 ± 2.7           | -16.7 ± 8.5          | GA00199 |  |
| QA                                         | N/A                  | N/A         | N/A   | $-0.1 \pm 0.1$ | -1.9 ± 1.6          | -15.1 ± 7.7          | GA00200 |  |
| WC2B                                       | -9.1                 | 102.6       | -1.0  | -0.1 ± 0.1     | 0.3 ± 2.7           | -17.5 ± 8.4          | GA00201 |  |
| WD1A                                       | 1.6                  | 235.6       | -1.0  | -0.1 ± 0.1     | 0.3 ± 2.7           | -20.0 ± 8.2          | GA00202 |  |
| WD2A                                       | 12.3                 | 36.2        | -1.0  | -0.1 ± 0.1     | 0.3 ± 2.7           | -10.6 ± 8.8          | GA00203 |  |
| WD3A                                       | -9.1                 | 3/9.6       | -1.0  | -0.1 ± 0.1     | -0.2 ± 2.5          | -18.8 ± 8.3          | GAUU204 |  |
| WD4A                                       | -9.1                 | 235.6       | -1.3  | -0.1 ± 0.1     | -0.2 ± 2.5          | -19.2 ± 8.2          | GA00205 |  |
| WD5A                                       | -9.1                 | -41.3       | -1.1  | $-0.1 \pm 0.1$ | -0.8 ± 2.2          | -18.3 ± 8.3          | GA00206 |  |
| WD1B                                       | 1.6                  | 180.2       | -1.1  | $-0.1 \pm 0.1$ | 3.0 ± 3.6           | $-18.3 \pm 8.3$      | GA00207 |  |
| WD2B                                       | -9.1                 | 180.2       | -1.0  | $-0.1 \pm 0.1$ | $1.4 \pm 3.1$       | -12.5 ± 8.9          | GA00208 |  |
| WD3B                                       | 12.3                 | 268.8       | -0.9  | -0.1 ± 0.1     | $-1.3 \pm 1.9$      | $-10.3 \pm 8.5$      | GA00209 |  |
| WU4B                                       | 1.6                  | 240.0       | -0.9  | -0.1 ± 0.1     | U.OI 2.9            | -19.2 ± 8.2          | GAUU210 |  |
|                                            | 12.3                 | 20.1        | -1.2  |                | 1.4I J.1            | -1/.1 I 8.4          | GA00211 |  |
| VVE1A                                      | -9.1                 | 2/9.9       | -1.4  | -0.1 I 0.1     | -U.0 I 2.2          | -15.4 ± 8.6          | GAU0212 |  |

C-27-1

| Fort Meade, Building 2813 (Room 1 - Walls) |             |             |       |                |                     |               |            |
|--------------------------------------------|-------------|-------------|-------|----------------|---------------------|---------------|------------|
| Location                                   |             | Monitoring  |       |                | Wipe Test           |               |            |
| Code                                       | Alpha       | Beta        | Gamma | Alpha          | Beta                | LS            | Wipe       |
| (Units =>)                                 | dpm/100cm^2 | dpm/100cm^2 | uR/hr | dp             | m/100cm^2 +/- 2 sig | ma            | Number     |
| (Bkgd =>)                                  | 1.7         | 149.47      | 5.00  | 0.1            | 2.0                 | 25.7          | 1          |
| (MDA =>)                                   | 54          | 401         | -     | 2.3            | 2.4                 | 33.0          |            |
| WI15A                                      | 22.9        | 235.6       | 1.2   | -0.2 ± 0.1     | 0.1 ± 2.1 ·         | -19.2 ± 8.9   | GA00263    |
| WI16A                                      | 1.6         | 246.6       | 1.0   | 0.4 ± 1.1      | -0.7 ± 1.7          | -22.6 ± 8.9   | GA00264    |
| WI1B                                       | -9.1        | 135.9       | -1.2  | 0.4 ± 1.1      | 1.4 ± 2.5           | -20.9 ± 9.0   | GA00265    |
| WI2B                                       | -9.1        | 235.6       | -0.7  | 0.4 ± 1.1      | -1.9 ± 0.9          | -22.1 ± 8.9   | GA00266    |
| WI3B                                       | 1.6         | 335.3       | -0.6  | -0.2 ± 0.1     | 1.0 ± 2.4           | -20.4 ± 8.8   | GA00267    |
| WI4B                                       | 1.6         | 224.5       | -0.2  | 5.0 ± 3.4      | 3.1 ± 3.0           | -24.6 ± 8.4   | GA00268    |
| WI5B                                       | -9.1        | 158.0       | -0.1  | -0.2 ± 0.1     | -0.3 ± 1.9          | -24.7 ± 8.7   | GA00269    |
| WB6B                                       | 1.6         | 124.8       | -0.1  | -0.2 ± 0.1     | -0.3 ± 1.9          | -42.0 ± 13.3  | GA00270    |
| WB7B                                       | 1.6         | 246.6       | -0.3  | 0.4 ± 1.1      | -0.7 ± 1.7          | -21.8 ± 10.0  | GA00271    |
| WB8B                                       | 1.6         | 246.6       | -0.4  | -0.2 ± 0.1     | 0.6 ± 2.2           | -29.1 ± 9.1   | GA00272    |
| WI9B                                       | 12.3        | -74.6       | -0.6  | -0.2 ± 0.1     | -1.1 ± 1.5          | -36.4 ± 13.0  | GA00273    |
| WI10B                                      | -9.1        | 257.7       | -0.4  | 1.6 ± 2.0      | -1.5 ± 1.2          | -19.6 ± 9.7   | GA00274    |
| WI11B                                      | 12.3        | 36.2        | -0.4  | -0.2 ± 0.1     | -0.7 ± 1.7          | -24.7 ± 9.2   | GA00275    |
| WI12B                                      | -9.1        | 346.3       | -0.2  | -0.2 ± 0.1     | -0.7 ± 1.7          | -40.0 ± 13.7  | GA00276    |
| WI13B                                      | 1.6         | 246.6       | 0.2   | -0.2 ± 0.1     | 0.1 ± 2.1           | -24.3 ± 9.5   | GA00277    |
| WI14B                                      | 1.6         | 335.3       | 0.2   | 0.4 ± 1.1      | -0.3 ± 1.9          | -23.4 ± 9.3   | GA00278    |
| WI15B                                      | -9.1        | 158.0       | 0.2   | 0.4 ± 1.1      | 2.2 ± 2.8           | -24.1 ± 10.0  | GA00279    |
| WI16B                                      | -9.1        | 257.7       | 0.1   | -0.2 ± 0.1     | 0.1 ± 2.1           | -22.1 ± 9.4   | GA00280    |
| WJIA                                       | -9.1        | 335.3       | 0.2   | -0.2 ± 0.1     | 2.7 ± 2.9           | -24.7 ± 9.2   | GA00281    |
| WJ2A                                       | 1.6         | 335.3       | 0.4   | 0.4 ± 1.1      | -0.3 ± 1.9          | -26.0 ± 9.1   | GA00282    |
| WJ3A                                       | 1.6         | 246.6       | 0.5   | 0.4 ± 1.1      | 0.6 ± 2.2           | -23.4 ± 9.3   | GA00283    |
| WJ4A                                       | 1.6         | 213.4       | 0.4   | -0.2 ± 0.1     | -0.7 ± 1.7          | -23.4 ± 9.3   | GA00284    |
| WJ5A                                       | -9.1        | 324.2       | 0.5   | 0.4 ± 1.1      | 0.6 ± 2.2           | -21.7 ± 9.5   | GA00285    |
| WJ1B                                       | 1.6         | 102.6       | 0.5   | -0.2 ± 0.1     | 3.1 ± 3.0           | -22.1 ± 9.4   | GA00286    |
| WJ2B                                       | 1.6         | 69.4        | 0.6   | -0.2 ± 0.1     | -0.3 ± 1.9          | -25.6 ± 10.2  | GA00287    |
| WJ3B                                       | 1.6         | 291.0       | 0.4   | -0.2 ± 0.1     | -1.5 ± 1.2          | -26.8 ± 9.0   | GA00288    |
| WJ4B                                       | -9.1        | 335.3       | 0.2   | $-0.2 \pm 0.1$ | 0.1 ± 2.1           | -21.3 ± 9.5   | GA00289    |
| WJ5B                                       | 1.6         | 91.6        | 0.4   | 0.4 ± 1.1      | 3.9 ± 3.2           | -23.0 ± 9.6   | GA00290    |
| WK1A                                       | 1.6         | -19.2       | 0.2   | -0.2 ± 0.1     | 1.0 ± 2.4           | -22.1 ± 9.4   | GA00291    |
| WK2A                                       | -9.1        | -229.7      | 0.0   | -0.2 ± 0.1     | 0.6 ± 2.2           | -24.7 ± 9.2   | GA00292    |
| WK3A                                       | 12.3        | 47.3        | 0.1   | -0.2 ± 0.1     | -1.9 ± 0.9          | -23.0 ± 9.4   | GA00293    |
| WK1B                                       | 12.3        | 401.7       | 0.1   | -0.2 ± 0.1     | -1.5 ± 1.2          | -22.1 ± 9.2   | GA00294    |
| WK2B                                       | -9.1        | 423.9       | 0.1   | -0.2 ± 0.1     | 0.6 ± 2.2           | -24.3 ± 9.2   | GA00295    |
| WK3B                                       | 1.6         | 146.9       | 0.1   | 0.4 ± 1.1      | 0.6 ± 2.2           | -21.7 ± 9.5   | GA00296    |
| WLIA                                       | -9.1        | 146.9       | 0.0   | -0.2 ± 0.1     | 0.6 ± 2.2           | -23.4 ± 9.3   | GA00297    |
| WL2A                                       | -9.1        | 357.4       | -0.1  | $-0.2 \pm 0.1$ | 0.6 ± 2.2           | -23.0 ± 9.4   | GA00298    |
| WAJA                                       | -9.1        | -19.2       | 0.0   | $-0.2 \pm 0.1$ | 0.6 ± 2.2           | -23.4 ± 9.3   | GA00299    |
|                                            | N/A         | N/A         |       | $-0.2 \pm 0.1$ | $1.8 \pm 2.6$       | -23.0 ± 9.4   | GA00300    |
| WLAA                                       | 12.3        | -130.0      | -0.1  | -0.2 ± 0.1     | -0.3 ± 1.9          | -27.2 ± 9.0   | GA00301    |
| WILLID                                     | 22.9        | 3.0         | 0.2   | -0.2 ± 0.1     | 3.5 ± 3.1           | -24./± 9.2    | GA00302    |
|                                            | -9.1        | -307.2      | 0.1   | 1.UI 1.0       | 1.4± 2.5            | -25.5 ± 9.1   | GA00303    |
| WILSD                                      | 12.3        | -19.2       | 0.0   | -0.2 ± 0.1     | U.DI 2.2            | -19.6 ± 9.7   | GA00304    |
| IVVL4D                                     | 1.0         | C.Uo        | -0.2  | I -U.ZII U.T   | i -1.1 ± 1.5        | I -24.8 ± 9.4 | IGA00305 [ |



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|            |             | Fo          | rt Meade,  | Building 2813 | (Room 2)            |                                       |         |
|------------|-------------|-------------|------------|---------------|---------------------|---------------------------------------|---------|
| Location   |             | Monitoring  |            |               | Wipe Test           | · · · · · · · · · · · · · · · · · · · |         |
| Code       | Alpha       | Beta        | Gamma      | Alpha         | Beta                | LS                                    | Wipe    |
| (Units =>) | dpm/100cm^2 | dpm/100cm^2 | uR/hr      | dpi           | m/100cm^2 +/- 2 sig | ma                                    | Number  |
| (Bkgd =>)  | 1.7         | 149.47      | 5.00       | 0.0           | 2.4                 | 12.3                                  | 1       |
| (MDA =>)   | 54          | 401         | <b>-</b> · | 2.2           | 2.5                 | 21.9                                  | 1       |
| FA1        | 1.6         | 202.3       | -1.1       | -0.2 ± 0.1    | -0.7 ± 1.7          | ✓ -21.8 ± 10.2                        | GA00306 |
| FA2        | -9.1        | 224.5       | -0.6       | -0.2 ± 0.1    | 0.1 ± 2.1           | -29.3 ± 9.9                           | GA00307 |
| FA3        | -9.1        | 257.7       | -0.4       | -0.2 ± 0.1    | 0.6 ± 2.2           | -22.3 ± 10.5                          | GA00308 |
| FB1        | 1.6         | 224.5       | -0.4       | 0.4 ± 1.1     | 0.6 ± 2.2           | -25.3 ± 9.7                           | GA00309 |
| FB2        | 1.6         | 291.0       | -0.3       | -0.2 ± 0.1    | -0.7 ± 1.7          | -24.0 ± 9.8                           | GA00310 |
| FB3        | 1.6         | 268.8       | -0.3       | -0.2 ± 0.1    | -0.3 ± 1.9          | -0.4 ± 3.0                            | GA00311 |
| FC1        | -9.1        | 434.9       | -0.2       | 0.4 ± 1.1     | -1.1 ± 1.5          | -28.3 ± 9.1                           | GA00312 |
| FC2        | 1.6         | 235.6       | -0.2       | -0.2 ± 0.1    | 0.6 ± 2.2           | -25.9 ± 9.9                           | GA00313 |
| FC3        | 1.6         | 302.0       | -0.1       | -0.2 ± 0.1    | -1.1 ± 1.5          | -20.9 ± 10.3                          | GA00314 |
| FD1        | -9.1        | 368.5       | -0.1       | -0.2 ± 0.1    | 1.0 ± 2.4           | -26.5 ± 9.3                           | GA00315 |
| FD2        | 12.3        | 390.6       | 0.0        | -0.2 ± 0.1    | -1.1 ± 1.5          | -22.3 ± 10.2                          | GA00316 |
| FD3        | 12.3        | 124.8       | -0.1       | -0.2 ± 0.1    | -0.7 ± 1.7          | -21.8 ± 9.2                           | GA00317 |
| WA1A       | -9.1        | 401.7       | -0.1       | -0.2 ± 0.1    | 0.1 ± 2.1           | -20.4 ± 8.4                           | GA00318 |
| WA2A       | -9.1        | 335.3       | 0.1        | 0.4 ± 1.1     | 0.6 ± 2.2           | -17.9 ± 8.6                           | GA00319 |
| WA3A       | 12.3        | 91.6        | 0.0        | 0.0 ± 0.1     | 0.1 ± 2.7           | -17.1 ± 8.7                           | GA00320 |
| WA1B       | 22.9        | 357.4       | 0.0        | 0.0 ± 0.1     | -1.0 ± 2.2          | -20.0 ± 8.4                           | GA00321 |
| WA2B       | 1.6         | 313.1       | 0.0        | 0.0 ± 0.1     | -0.4 ± 2.5          | -23.0 ± 10.2                          | GA00322 |
| WA3B       | 12.3        | 135.9       | 0.1        | 0.0 ± 0.1     | -0.4 ± 2.5          | -19.2 ± 8.5                           | GA00323 |
| WB1A       | 1.6         | 346.3       | 0.2        | 0.0 ± 0.1     | -0.4 ± 2.5          | -14.2 ± 8.9                           | GA00324 |
| WB2A       | -9.1        | 291.0       | 0.1        | 0.0 ± 0.1     | -2.6 ± 1.2          | -17.9 ± 8.6                           | GA00325 |
| WB3A       | 1.6         | 257.7       | 0.1        | 0.7 ± 1.5     | 0.1 ± 2.7           | -16.2 ± 9.0                           | GA00326 |
| WB4A       | -9.1        | 191.3       | 0.2        | 0.7 ± 1.5     | 0.7 ± 2.9           | -20.8 ± 8.3                           | GA00327 |
| WB1B       | -9.1        | 158,0       | 0.1        | 0.0 ± 0.1     | -1.0 ± 2.2          | -17.5 ± 8.6                           | GA00328 |
| WB2B       | 1.6         | 302.0       | -0.1       | 0.0 ± 0.1     | $2.3 \pm 3.4$       | -16.3 ± 8.8                           | GA00329 |
| WB3B       | -9.1        | 113.7       | -0.2       | 0.7 ± 1.5     | 2.8 ± 3.6           | -22.5 ± 8.2                           | GA00330 |
| WB4B       | 1.6         | 58.3        | -0.3       | 0.0 ± 0.1     | $-1.0 \pm 2.2$      | -16.2 ± 9.0                           | GA00331 |
| WC1A       | -9.1        | 135.9       | -0.1       | 0.0 ± 0.1     | 0.7 ± 2.9           | -15.8 ± 8.8                           | GA00332 |
| WC2A       | 1.6         | 102.6       | 0.1        | 0.0 ± 0.1     | 1.2 ± 3.1           | -12.5 ± 9.1                           | GA00333 |
| WC3A       | -9.1        | 69.4        | 0.2        | 0.7 ± 1.5     | -0.4 ± 2.5          | -17.4 ± 8.9                           | GA00334 |
| WC1B       | -9.1        | 102.6       | 0.1        | 0.0 ± 0.1     | -0.4 ± 2.5          | -20.8 ± 8.3                           | GA00335 |
| WC2B       | -9.1        | -52.4       | -0.1       | 0.7 ± 1.5     | 1.2 ± 3.1           | -19.1 ± 8.7                           | GA00336 |
| WC3B       | 1.6         | 102.6       | -0.1       | 0.0 ± 0.1     | -1.5 ± 1.9          | -23.4 ± 8.3                           | GA00337 |
| WD1A       | -9.1        | 158.0       | -0.2       | 0.0 ± 0.1     | 1.2 ± 3.1           | -13.3 ± 9.0                           | GA00338 |
| WD2A       | -9.1        | 113.7       | -0.1       | 0.0 ± 0.1     | 0.1 ± 2.7           | -19.6 ± 8.4                           | GA00339 |
| WD3A       | 12.3        | 58.3        | 0.0        | 0.0 ± 0.1     | -0.4 ± 2.5          | -20.4 ± 8.6                           | GA00340 |
| WD4A       | 1.6         | 313.1       | -0.1       | 0.0 ± 0.1     | -1.5 ± 1.9          | -24.3 ± 8.2                           | GA00341 |
| WD1B       | 33.6        | 180.2       | -0.1       | 0.0 ± 0.1     | 0.1 ± 2.7           | -15.7 ± 9.0                           | GA00342 |
| WD2B       | -9.1        | 235.6       | -0.3       | 0.0 ± 0.1     | -1.5 ± 1.9          | -12.9 ± 9.1                           | GA00343 |
| WD3B       | 1.6         | -74.6       | -0.3       | $0.0 \pm 0.1$ | -0.4 ± 2.5          | -26.4 ± 8.7                           | GA00344 |
| WD4B       | -9.1        | 14.0        | -0.3       | 0.0 ± 0.1     | -1.0 ± 2.2          | -14.5 ± 9.1                           | GA00345 |

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|            |             | Fort        | Meade, B | uilding 2813 (R        | estroom 1)          |              |         |
|------------|-------------|-------------|----------|------------------------|---------------------|--------------|---------|
| Location   |             | Monitoring  |          |                        | Wipe Test           |              |         |
| Code       | Alpha       | Beta        | Gamma    | Alpha                  | Beta                | LS           | Wipe    |
| (Units =>) | dpm/100cm^2 | dpm/100cm^2 | uR/hr    | dp                     | m/100cm^2 +/- 2 sig | ma           | Number  |
| (Bkgd =>)  | 1.7         | 149.47      | 5.00     | 0.0                    | 2.4                 | 27.5         | i I     |
| (MDA =>)   | 54          | 401         | -        | 2.2                    | 2.5                 | 27.3         |         |
| FA1        | 1.6         | 224.5       | -1.1     | 0.0 ± 0.1              | 0.1 ± 2.7           | -12.7 ± 10.0 | GA00346 |
| FA2        | -9.1        | 368.5       | -1.2     | 0.0 ± 0.1              | -0.4 ± 2.5          | -21.4 ± 9.2  | GA00347 |
| FA3        | -9.1        | 235.6       | -1.2     | 0.0 ± 0.1              | 1.2 ± 3.1           | -24.1 ± 8.9  | GA00348 |
| FA4        | 1.6         | 113.7       | -1.4     | 0.0 ± 0.1              | -0.4 ± 2.5          | -23.3 ± 9.6  | GA00349 |
| QA         | N/A         | N/A         | N/A      | 0.0 ± 0.1              | -0.4 ± 2.5          | -19.6 ± 8.7  | GA00350 |
| FB1        | 1.6         | 191.3       | -1.5     | 0.0 ± 0.1              | -0.4 ± 2.5          | -23.8 ± 13.2 | GA00351 |
| FB2        | -9.1        | 302.0       | -1.4     | 0.0 ± 0.1              | -1.0 ± 2.2          | -22.9 ± 9.6  | GA00352 |
| FB3        | 1.6         | 324.2       | -1.2     | 0.0 ± 0.1              | -2.6 ± 1.2          | -20.5 ± 9.3  | GA00353 |
| FB4        | 1.6         | 291.0       | -1.2     | 0.0 ± 0.1              | 0.7 ± 2.9           | -16.5 ± 9.2  | GA00354 |
| WA1A       | -9.1        | 158.0       | -1.3     | 0.0 ± 0.1              | 3.9± 3.9            | -15.2 ± 9.3  | GA00355 |
| WA2A       | 12.3        | -8.1        | -1.4     | 0.0± 0.1               | -0.4 ± 2.5          | -18.7 ± 8.7  | GA00356 |
| WA3A       | 12.3        | 14.0        | -1.5     | 1.5 ± 2.2              | -0.4 ± 2.5          | -17.0 ± 8.9  | GA00357 |
| WA4A       | -9.1        | 36.2        | -1.6     | 0.0 ± 0.1              | 0.1 ± 2.7           | -14.9 ± 9.1  | GA00358 |
| WA1B       | -9.1        | -85.7       | -1.6     | 0.7± 1.5               | -1.0 ± 2.2          | -18.3 ± 8.8  | GA00359 |
| WA2B       | 12.3        | 335.3       | -1.6     | 0.0 ± 0.1              | 1.7 ± 3.3           | -15.8 ± 8.8  | GA00360 |
| WA3B       | 22.9        | 69.4        | -1.7     | 0.0 ± 0.1              | -2.1 ± 1.6          | -16.7 ± 8.7  | GA00361 |
| WA4B       | 1.6         | 47.3        | -1.5     | 0.0± 0.1               | -0.4 ± 2.5          | -15.7 ± 8.1  | GA00362 |
| WB1A       | 12.3        | 268.8       | -1.5     | 0.0 ± 0.1              | 1.2 ± 3.1           | -13.2 ± 8.4  | GA00363 |
| WB2A       | 1.6         | 146.9       | -1.5     | 0.7 ± 1.5 <sup>7</sup> | 0.1 ± 2.7           | -10.6 ± 8.6  | GA00364 |
| WB1B       | -9.1        | 235.6       | -1.2     | 0.0 ± 0.1              | 0.7 ± 2.9           | -27.1 ± 12.0 | GA00365 |
| WB2B       | 1.6         | 335.3       | -1.1     | 0.0 ± 0.1              | -0.4 ± 2.5          | -16.9 ± 8.4  | GA00366 |
| WC1A       | -9.1        | 180.2       | -1.2     | 0.4 ± 1.1              | -0.3 ± 1.9          | -14.5 ± 8.3  | GA00367 |
| WC2A       | -9.1        | -52.4       | -1.4     | $-0.2 \pm 0.1$         | -0.7 ± 1.7          | -8.3 ± 9.1   | GA00368 |
| WC3A       | 1.6         | 135.9       | -1.4     | -0.2 ± 0.1             | 0.1 ± 2.1           | -10.0 ± 8.9  | GA00369 |
| WC4A       | -9.1        | -8.1        | -1.6     | 0.4 ± 1.1              | -0.7 ± 1.7          | -10.4 ± 8.9  | GA00370 |
| WC1B       | 1.6         | 91.6        | -1.6     | -0.2 ± 0.1             | -1.5 ± 1.2          | -17.3 ± 8.4  | GA00371 |
| WC2B       | -9.1        | 80.5        | -1.6     | -0.2 ± 0.1             | -1.5 ± 1.2          | -12.6 ± 9.3  | GA00372 |
| WC3B       | 1.6         | 80.5        | -1.5     | $0.4 \pm 1.1$          | 0.6 ± 2.2           | -15.2 ± 8.4  | GA00373 |
| WC4B       | -9.1        | 69.4        | -1.5     | 0.4 ± 1.1              | 1.0 ± 2.4           | -12.5 ± 8.2  | GA00374 |
| WD1A       | -9.1        | 556.8       | -1.6     | 1.0 ± 1.6              | -1.1 ± 1.5          | -14.0 ± 8.3  | GA00375 |
| WD2A       | -9.1        | 58.3        | -1.5     | 0.4 ± 1.1              | 1.8 ± 2.6           | -14.0 ± 8.3  | GA00376 |
| WD1B       | 1.6         | 180.2       | -1.5     | -0.2 ± 0.1             | -0.3 ± 1.9          | -16.9 ± 8.4  | GA00377 |
| WD2B       | -9.1        | 124.8       | -1.7     | -0.2 ± 0.1             | -1.1 ± 1.5          | -15.3 ± 8.2  | GA00378 |

(1) State (All and NO COUNTS 9)



C-31

|            |             | Fort        | Meade, B | uilding 2813 (R  | estroom 2)          | · · · · · · · · · · · · · · · · · · · |          |
|------------|-------------|-------------|----------|------------------|---------------------|---------------------------------------|----------|
| Location   |             | Monitoring  |          |                  | Wipe Test           |                                       |          |
| Code       | Alpha       | Beta        | Gamma    | Alpha            | Beta                | LS                                    | Wipe     |
| (Units =>) | dpm/100cm^2 | dpm/100cm^2 | uR/hr    | dpi              | n/100cm^2 +/- 2 sig | ma                                    | Number   |
| (Bkgd =>)  | 1.7         | 149.47      | 5.00     | 0.1              | 2.0                 | 27.5                                  |          |
| (MDA =>)   | 54          | 401         | •        | 2.4              | 2.4                 | 21.4                                  |          |
| FA1        | -9.1        | 346.3       | -0.8     | 0.4 ± 1.1        | -0.3 ± 1.9          | -15.7 ± 8.1                           | GA00379  |
| FA2        | -9.1        | 146.9       | -0.9     | -0.2 ± 0.1       | 0.6 ± 2.2           | -17.9 ± 7.9                           | GA00380  |
| FA3        | 1.6         | 379.6       | -0.9     | 0.4 ± 1.1        | 0.6 ± 2.2           | -16.9 ± 8.4                           | GA00381  |
| FB1        | -9.1        | 124,8       | -1.0     | 1.0 ± 1.6        | 0.6 ± 2.2           | -13.2 ± 9.0                           | GA00382  |
| FB2        | -9.1        | 69.4        | -0.9     | 0.4 ± 1.1        | -1.1 ± 1.5          | -16.1 ± 8.3                           | GA00383  |
| FB3        | -9.1        | 401.7       | -0.9     | 0.4 ± 1.1        | -1.1 ± 1.5          | -17.3 ± 8.4                           | GA00384  |
| FC1        | 1.6         | 213.4       | -0.9     | -0.2 ± 0.1       | 0.1 ± 2.1           | -13.8 ± 8.8                           | GA00385  |
| FC2        | -9.1        | 324.2       | -0.7     | 0.4 ± 1.1        | -1.1 ± 1.5          | -18.2 ± 8.5                           | GA00386  |
| FC3        | 1.6         | 202.3       | -0.7     | -0.2 ± 0.1       | 1.4 ± 2.5           | -19.1 ± 8.7                           | GA00387  |
| WA1A       | -9.1        | 146.9       | -0.9     | -0.2 ± 0.1       | -1.5 ± 1.2          | -11.1 ± 8.6                           | GA00388  |
| WA2A       | 1.6         | 69.4        | -0.9     | -0.2 ± 0.1       | 0.6 ± 2.2           | -15.3 ± 8.2                           | GA00389  |
| WA3A       | 1.6         | 91.6        | -1.0     | 0.4 ± 1.1        | -1.1 ± 1.5          | -11.9 ± 8.5                           | GA00390  |
| WA1B       | -9.1        | 158.0       | -1.1     | -0.2 ± 0.1       | -1.1 ± 1.5          | -16.6 ± 8.0                           | GA00391  |
| WA2B       | -9.1        | 47.3        | -1.3     | 0.4 ± 1.1        | -0.3 ± 1.9          | -16.2 ± 8.1                           | GA00392  |
| WA3B       | -9.1        | 14.0        | -1.3     | -0.2 ± 0.1       | 0.6 ± 2.2           | -15.7 ± 8.1                           | GA00393  |
| WB1A       | -9.1        | 91.6        | -1.1     | -0.2 ± 0.1       | -0.3 ± 1.9          | -17.4 ± 8.2                           | GA00394  |
| WB2A       | -9.1        | 202.3       | -1.0     | -0.2 ± 0.1       | 0.1 ± 2.1           | -18.7 ± 7.8                           | GA00395  |
| WB3A       | -9.1        | 268.8       | -0.9     | -0.2 ± 0.1       | -1.1 ± 1.5          | -11.9 ± 8.5                           | GA00396  |
| WB1B       | -9.1        | 135.9       | -0.8     | -0.2 ± 0.1       | -0.7 ± 1.7          | -9.8 ± 8.7                            | GA00397  |
| WB2B       | -9.1        | 135.9       | -0.8     | -0.2 ± 0.1       | -0.7 ± 1.7          | -17.0 ± 8.0                           | GA00398  |
| WB3B       | 1.6         | 69.4        | -0.8     | 0.4 ± 1.1        | 0.6 ± 2.2           | -15.0 ± 8.0                           | GA00399  |
| QA         | N/A         | N/A         | N/A      | -0.2 ± 0.1       | 2.7 ± 2.9           | -15.3 ± 8.2                           | GA00400  |
| WC1A       | -9.1        | 180.2       | -1.1     | -0.2 ± 0.1       | 1.4 ± 2.5           | -14.0 ± 8.3                           | GA00401  |
| WC2A       | 12.3        | 3.0         | -1.1     | -0.2 ± 0.1       | -0.3 ± 1.9          | -15.5 ± 8.8                           | GA00402  |
| WC3A       | 1.6         | 69.4        | -1.1     | 0.4 ± 1.1        | -1.5 ± 1.2          | -17.8 ± 8.1                           | GA00403  |
| WC1B       | -9.1        | 379.6       | -1.0     | -0.2 ± 0.2       | 7.3 ± 4.6           | -11.5 ± 8.5                           | GA00404  |
| WC2B       | -9.1        | 279.9       | -0.9     | -0.2 ± 0.2       | 2.9 ± 3.4           | -17.4 ± 10.3                          | GA00405  |
| WC3B       | -9.1        | 69.4        | -0.9     | -0.2 ± 0.2       | 3.5 ± 3.6           | -12.9 ± 8.8                           | GA00406  |
| WD1A       | -9.1        | -30.3       | -1.0     | 2.2 ± 2.6        | 2.4 ± 3.3           | -21.0 ± 9.6                           | GA00407  |
| WD1B       | -9.1        | 58.3        | -0.9     | 0.6 ± 1.5        | 1.3 ± 2.9           | -17.7 ± 9.4                           | GA00408  |
| WE1A       | -9.1        | 158.0       | -1.1     | 0.6 ± 1.5        | 0.7 ± 2.7           | -19.1 ± 8.3                           | GA00409  |
| WE2A       | -9.1        | 91.6        | -1.2     | -0.2 ± 0.2       | 1.8 ± 3.1           | -12.8 ± 8.9                           | GA00410  |
| WE1B       | 1.6         | 135.9       | -1.0     | -0.2 ± 0.2       | 1.3 ± 2.9           | -20.4 ± 8.4                           | GA00411  |
| WE2B       | -9.1        | 346.3       | -0.9     | -0.2 ± 0.2       | 5.7 ± 4.2           | -15.3 ± 8.7                           | GA00412  |
| WF1A       | -9.1        | 180.2       | -0.9     | -0.2 ± 0.2       | 0.2 ± 2.4           | -10.2 ± 9.1                           | GA00413  |
| WF2A       | 1.6         | -141.0      | -1.0     | -0.2 ± 0.2       | 2.4 ± 3.3           | -14.0 ± 8.8                           | GA00414  |
| WF1B       | 12.3        | 158.0       | -0.9     | -0.2 ± 0.2       | 4.6 ± 3.9           | -14.5 ± 8.7                           | GA00415  |
| WF2B       | -9.1        | 124.8       | -1.0     | -0.2 ± 0.2       | -0.4 ± 2.2          | -14.5 ± 8.7                           | IGA00416 |
| WG1A       | -9.1        | 80.5        | -1.0     | -0.2 ± 0.2       | 0.7 ± 2.7           | -17.0 ± 8.5                           | IGA00417 |
| WG2A       | 1.6         | 191.3       | -1.1     | 0.6 ± 1.5        | 2.9 ± 3.4           | -15.4 ± 8.4                           | GA00418  |
| WG1B       | 1.6         | 25.1        | -1.3     | 0.6 ± 1.5        | -0.4 ± 2.2          | -16.2 ± 8.6                           | GA00419  |
| WG2B       |             | 69.4        | i -1.4   | $1 -0.2 \pm 0.2$ | 0.7 ± 2.7           | 1 -187 + 83                           | IGA00420 |

C-30-1

|            |             | Fort Meade, | , Building | 2813 (Rm 1 - C          | ounters/Drawe | rs)                                   |         |
|------------|-------------|-------------|------------|-------------------------|---------------|---------------------------------------|---------|
| Location   |             | Monitoring  |            | •                       | Wipe Test     | · · · · · · · · · · · · · · · · · · · |         |
| Code       | Alpha       | Beta        | Gamma      | Alpha                   | Beta          | LS                                    | Wipe    |
| (Units =>) | dpm/100cm^2 | dpm/100cm^2 | uR/hr      | dpm/100cm^2 +/- 2 sigma |               |                                       | Number  |
| (Bkgd =>)  | 1.7         | 149.47      | 5.00       | 0.0                     | 2.1           | 26.7                                  | 1 ·     |
| (MDA =>)   | 54          | 401         | -          | 2.3                     | 2.5           | 25.6                                  | 1 ·     |
| RCNTR1     | -9.1        | 180.2       | -1.1       | 0.0 ± 0.1               | 0.7 ± 2.9     | -17.7 ± 9.5                           | GA00482 |
| RCNTR1S    | -9.1        | 213.4       | -1.1       | 0.7 ± 1.5               | 1.2 ± 3.1     | -22.9 ± 9.5                           | GA00483 |
| RCNTR2     | 22.9        | 224.5       | -1.2       | 0.0 ± 0.1               | -0.4 ± 2.5    | -18.7 ± 8.9                           | GA00484 |
| RCNTR2     | 12.3        | -41.3       | -1.1       | 0.0 ± 0.1               | 2.3 ± 3.4     | -24.2 ± 9.1                           | GA00485 |
| RCNTR3     | 1.6         | 113.7       | -0.8       | 0.0 ± 0.1               | 0.7 ± 2.9     | -17.0 ± 10.6                          | GA00486 |
| RCNTR3S    | 1.6         | 268.8       | -0.8       | 0.0 ± 0.1               | -1.5 ± 1.9    | -21.0 ± 10.3                          | GA00487 |
| RWSINK     | 1.6         | 268.8       | -0.9       | 0.0 ± 0.1               | 0.1 ± 2.7     | -19.6 ± 9.1                           | GA00488 |
| RCNTR4     | -9.1        | 180.2       | -0.3       | 0.0 ± 0.1               | -1.5 ± 1.9    | -14.8 ± 9.3                           | GA00489 |
| RCNTR4S    | 1.6         | 246.6       | -0.6       | 0.0 ± 0.1               | 0.1 ± 2.7     | -22.0 ± 9.9                           | GA00490 |
| RCNTR4R    | -9.1        | 180.2       | -0.6       | 0.0 ± 0.1               | 0.7 ± 2.9     | -20.0 ± 9.5                           | GA00491 |
| RD1        | -9.1        | 202.3       | -0.3       | 0.0 ± 0.1               | -1.0 ± 2.2    | -22.3 ± 9.0                           | GA00492 |
| RD2        | -9.1        | 80.5        | -0.3       | 0.0 ± 0.1               | 1.2 ± 3.1     | -17.4 ± 9.0                           | GA00493 |
| RD3        | -9.1        | 423.9       | -0.2       | 0.0 ± 0.1               | -0.4 ± 2.5    | -17.9 ± 11.2                          | GA00494 |
| RD4        | -9.1        | 202.3       | -0.6       | 0.0 ± 0.1               | -2.1 ± 1.6    | -22.3 ± 9.0                           | GA00495 |
| RD5        | -9.1        | -30.3       | -0.9       | 0.0 ± 0.1               | -1.5 ± 1.9    | -20.0 ± 9.3                           | GA00496 |
| RD6        | -9.1        | 124.8       | -0.6       | 0.0 ± 0.1               | 1.7 ± 3.3     | -23.8 ± 11.5                          | GA00497 |
| RD7        | -9.1        | 135.9       | -0.8       | 0.0 ± 0.1               | 1.2 ± 3.1     | -27.0 ± 10.2                          | GA00498 |
| RD8        | 12.3        | 14.0        | -1.0       | 1.0 ± 1.6               | 1.4 ± 2.5     | -30.3 ± 11.7                          | GA00499 |
| QA         | N/A         | N/A         | N/A        | -0.2 ± 0.1              | -1.5 ± 1.2    | -20.0 ± 8.1                           | GA00500 |
| RD9        | -9.1        | -30.3       | -0.5       | -0.1 ± 0.1              | 1.1 ± 2.9     | -20.0 ± 9.6                           | GA00501 |
| RD10       | -9.1        | 146.9       | -0.7       | 0.7 ± 1.5               | 2.7 ± 3.4     | -21.9 ± 8.9                           | GA00502 |
| RD11       | -9.1        | 291.0       | -0.8       | -0.1 ± 0.1              | 1.1 ± 2.9     | -20.0 ± 9.9                           | GA00503 |
| RD12       | 1.6         | 47.3        | -0.8       | -0.1 ± 0.1              | -0.5 ± 2.2    | -16.4 ± 8.9                           | GA00504 |
| RD13       | 1.6         | 14.0        | -0.6       | -0.1 ± 0.1              | 1.6 ± 3.1     | -20.5 ± 8.5                           | GA00505 |
| RD14       | -9.1        | 113.7       | -0.6       | -0.1 ± 0.1              | 1.1 ± 2.9     | -22.0 ± 9.4                           | GA00506 |
| RD15       | 1.6         | 102.6       | -0.4       | 0.7 ± 1.5               | 3.8 ± 3.7     | -23.3 ± 8.4                           | GA00507 |
| RPIPE      | -9.1        | 257.7       | -0.7       | -0.1 ± 0.1              | -0.5 ± 2.2    | -22.3 ± 11.0                          | GA00508 |

C-32-1

| Fort Meade, Building 2813 (Randoms Above Two Meters) |             |             |       |            |                     |               |         |  |  |  |
|------------------------------------------------------|-------------|-------------|-------|------------|---------------------|---------------|---------|--|--|--|
| Location                                             | 1           | Monitoring  |       |            | Wipe Test           | · · ·         | T       |  |  |  |
| Code                                                 | Alpha       | Beta        | Gamma | Alpha      | Beta                | LS            | Wipe    |  |  |  |
| (Units =>)                                           | dpm/100cm^2 | dpm/100cm^2 | uR/hr | dpi        | m/100cm^2 +/- 2 sig | ma            | Number  |  |  |  |
| (Bkgd =>)                                            | 1.7         | 149.47      | 5.00  | 0.2        | 2.6                 | 30.0          | 1       |  |  |  |
| (MDA =>)                                             | 54          | 401         | -     | 2.4        | 2.4                 | 31.4          | 1       |  |  |  |
| RCFB2                                                | 1.6         | 379.6       | -0.4  | -0.2 ± 0.2 | -0.9 ± 1.9          | • -18.7 ± 8.3 | GA00421 |  |  |  |
| RWC2B                                                | 1.6         | 224.5       | -0.8  | -0.2 ± 0.2 | 0.7 ± 2.7           | -17.0 ± 8.5   | GA00422 |  |  |  |
| RWB4A                                                | -9.1        | 113.7       | -0.8  | -0.2 ± 0.2 | 1.3 ± 2.9           | -15.3 ± 8.7   | GA00423 |  |  |  |
| RWK2A                                                | -9.1        | 291.0       | 0.3   | 0.6 ± 1.5  | 1.3 ± 2.9           | -18.3 ± 8.4   | GA00424 |  |  |  |
| RWJ5B                                                | 1.6         | 213.4       | -0.2  | -0.2 ± 0.2 | 1.3 ± 2.9           | -14.5 ± 8.7   | GA00425 |  |  |  |
| RWJ1B                                                | 1.6         | 191.3       | 0.3   | -0.2 ± 0.2 | 2.9± 3.4            | -15.7 ± 8.6   | GA00426 |  |  |  |
| RCFI1                                                | 1.6         | 534.6       | 0.4   | 1.4 ± 2.2  | 2.9 ± 3.4           | -20.9 ± 8.1   | GA00427 |  |  |  |
| RWI12B                                               | -9.1        | 313.1       | -0.2  | -0.2 ± 0.2 | 1.8 ± 3.1           | -17.3 ± 8.9   | GA00428 |  |  |  |
| RCFC4                                                | 1.6         | 357.4       | 0.4   | -0.2 ± 0.2 | 0.7 ± 2.7           | -17.9 ± 8.4   | GA00429 |  |  |  |
| RWL4A                                                | 1.6         | 357.4       | -0.5  | -0.2 ± 0.2 | -0.4 ± 2.2          | -15.7 ± 8.6   | GA00430 |  |  |  |
| RWFB8                                                | -9.1        | 623.3       | -0.7  | -0.2 ± 0.2 | 0.7 ± 2.7           | -17.0 ± 8.5   | GA00431 |  |  |  |
| RWFB9                                                | -9.1        | 191.3       | -0.8  | -0.2 ± 0.2 | -1.4 ± 1.6          | -13.6 ± 8.8   | GA00432 |  |  |  |
| RWA7A                                                | -9.1        | 235.6       | -1.2  | 0.6 ± 1.5  | 1.3 ± 2.9           | -38.5 ± 13.9  | GA00433 |  |  |  |
| RCFE9                                                | -9.1        | 224.5       | -1.2  | -0.2 ± 0.2 | 0.2 ± 2.4           | -17.4 ± 8.5   | GA00434 |  |  |  |
| RCFC9                                                | -9.1        | 279.9       | -0.8  | 0.6± 1.5   | 1.3 ± 2.9           | -15.3 ± 8.7   | GA00435 |  |  |  |
| RCFI11                                               | 12.3        | 368.5       | -0.5  | -0.2 ± 0.2 | 0.2 ± 2.4           | -18.3 ± 8.4   | GA00436 |  |  |  |
| RWI1A                                                | 1.6         | 291.0       | 0.0   | -0.2 ± 0.2 | 1.8 ± 3.1           | -14.5 ± 8.7   | GA00437 |  |  |  |
| RWH2A                                                | -9.1        | 268.8       | 0.0   | -0.2 ± 0.2 | 0.2 ± 2.4           | -14.0 ± 8.8   | GA00438 |  |  |  |
| RWFA11                                               | 1.6         | 291.0       | -0.7  | -0.2 ± 0.2 | 0.2 ± 2.4           | -18.3 ± 8.4   | GA00439 |  |  |  |
| RCFC15                                               | -9.1        | 457.1       | -0.9  | -0.2 ± 0.2 | 2.4 ± 3.3           | -14.9 ± 8.7   | GA00440 |  |  |  |
| RCFE17                                               | 1.6         | 191.3       | -0.7  | 1.4 ± 2.2  | 1.3 ± 2.9           | -17.5 ± 8.2   | GA00441 |  |  |  |
| RWF4A                                                | 1.6         | 180.2       | -0.5  | 0.6 ± 1.5  | 0.7 ± 2.7           | -17.2 ± 9.4   | GA00442 |  |  |  |
| RCFH20                                               | -9.1        | 556.8       | -1.1  | 1.4 ± 2.2  | -0.4 ± 2.2          | -15.7 ± 8.6   | GA00443 |  |  |  |
| RCFF20                                               | -9.1        | 224.5       | -0.9  | -0.2 ± 0.2 | 0.7 ± 2.7           | -17.4 ± 8.7   | GA00444 |  |  |  |
| RCFB16                                               | 1.6         | 257.7       | -0.5  | -0.2 ± 0.2 | 0.2 ± 2.4           | -18.3 ± 8.4   | GA00445 |  |  |  |
| RCFB2                                                | 1.6         | 368.5       | -1.5  | -0.2 ± 0.2 | 1.3 ± 2.9           | -14.5 ± 8.7   | GA00446 |  |  |  |
| RWF1B                                                | -9.1        | 69.4        | -1.2  | -0.2 ± 0.2 | -0.4 ± 2.2          | -17.0 ± 8.5   | GA00447 |  |  |  |
| RWF2B                                                | 1.6         | 235.6       | -1.3  | -0.2 ± 0.2 | 0.2 ± 2.4           | -19.6 ± 8.3   | GA00448 |  |  |  |
| RWG2A                                                | 12.3        | 191.3       | -1.2  | -0.2 ± 0.2 | -0.4 ± 2.2          | -16.2 ± 8.6   | GA00449 |  |  |  |
| QA                                                   | N/A         | N/A         | N/A   | -0.2 ± 0.2 | 1.3 ± 2.9           | 475.9 ± 30.7  | GA00450 |  |  |  |
| RWB1B                                                | -9.1        | 25.1        | -1.2  | -0.2 ± 0.2 | 1.8 ± 3.1           | -16.5 ± 8.8   | GA00451 |  |  |  |

C-31-1

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|--------------------------------|------|------------|------------------|------|
|--------------------------------|------|------------|------------------|------|

|            | F           | ort Meade, I | Building      | 2805 (Random / | Above Two Met       | ers)            |         |
|------------|-------------|--------------|---------------|----------------|---------------------|-----------------|---------|
| Location   |             | Monitoring   |               |                |                     |                 |         |
| Code       | Alpha       | Beta         | Gamma         | Alpha          | Beta                | LS              | Wipe    |
| (Units =>) | dpm/100cm^2 | dpm/100cm^2  | uR/hr         | dpr            | m/100cm^2 +/- 2 sig | Number          |         |
| (Bkgd =>)  | 1.7         | 149.47       | 5.00          | 0.2            | 3.1                 | 24.9            | 1 1     |
| (MDA =>)   | 54          | 401          | -             | 2.4            | 2.4                 | 20.1            |         |
| RCB4       | 12.3        | 922.3        | -1.4          | -0.2 ± 0.2     | -1.9 ± 1.6          | ✔ -10.4 ± 8.0   | GA01666 |
| RCE3       | 1,6         | 1243.5       | -1.0          | -0.2 ± 0.2     | -1.9 ± 1.6          | -14.3 ± 8.9     | GA01667 |
| RCG3       | 22.9        | 999.8        | -0.8          | -0.2 ± 0.2     | -1.4 ± 1.9          | -12.1 ± 7.9     | GA01668 |
| RWB5C      | -9.1        | 25.1         | -0.8          | -0.2 ± 0.2     | -0.8 ± 2.2          | -14.6 ± 7.6     | GA01669 |
| RWB7C      | -9.1        | -96.7        | -0.9          | -0.2 ± 0.2     | -0.8 ± 2.2          | -14.5 ± 7.8     | GA01670 |
| RCB1       | 22.9        | 1332.2       | ; <b>-1.0</b> | -0.2 ± 0.2     | 1.9± 3.3            | -15.5 ± 9.3     | GA01671 |
| RWD4C      | 12.3        | 135.9        | -1.0          | -0.2 ± 0.2     | 0.8 ± 2.9           | -16.2 ± 7.6     | GA01672 |
| RCB5       | 12.3        | 1343.2       | -1.2          | -0.2 ± 0.2     | -0.3 ± 2.5          | -14.9 ± 7.8     | GA01673 |
| RCB5       | 1.6         | 1055.2       | -1.2          | -0.2 ± 0.2     | 0.3 ± 2.7           | -12.3 ± 8.0     | GA01674 |
| RCC3       | 12.3        | 102.6        | -1.4          | 1.4 ± 2.2      | -1.4 ± 1.9          | -21.5 ± 9.0     | GA01675 |
| RCD2       | 1.6         | 1221.4       | -1.5          | -0.2 ± 0.2     | -0.8 ± 2.2          | -14.0 ± 7.9     | GA01676 |
| RCA3       | 1.6         | 955.5        | -1.7          | -0.2 ± 0.2     | -0.8 ± 2.2          | -9.0 ± 8.0      | GA01677 |
| RCD1       | 1.6         | 1221.4       | -1.7          | -0.2 ± 0.2     | 0.3 ± 2.7           | -8.9 ± 8.4      | GA01678 |
| RWB1C      | 1.6         | 457.1        | -2.0          | -0.2 ± 0.2     | -0.3 ± 2.5          | -9.4 ± 8.0      | GA01679 |
| RWC2C      | 1.6         | 224.5        | -2.2          | -0.2 ± 0.2     | -0.8 ± 2.2          | -13.9 ± 8.1     | GA01680 |
| RWD3C      | 1.6         | 235.6        | -1.8          | -0.2 ± 0.2     | -0.8 ± 2.2          | -10.4 ± 8.0     | GA01681 |
| RWA4C      | -9.1        | 246.6        | -1.9          | 0.6± 1.5       | 0.8 ± 2.9           | -11.4 ± 8.8     | GA01682 |
| RWB3C      | 33.6        | 113.7        | -2.0          | -0.2 ± 0.2     | 1.4 ± 3.1           | -8.3 ± 8.2      | GA01683 |
| RWD2C      | -9.1        | 1442.9       | -1.9          | -0.2 ± 0.2     | -0.3 ± 2.5          | -17.6 ± 8.9     | GA01684 |
| RWA2C      | -9.1        | 246.6        | -1.9          | -0.2 ± 0.2     | 1.9 ± 3.3           | -7.7 ± 8.5      | GA01685 |
| RCB4       | -9.1        | 988.8        | -1.6          | -0.2 ± 0.2     | 1.4 ± 3.1           | -9.6 ± 8.1      | GA01686 |
| RWB2C      | 12.3        | -19.2        | -1,5          | -0.2 ± 0.2     | 0.8 ± 2.9           | -11.9 ± 8.1     | GA01687 |
| RCC1       | -9.1        | -63.5        | -1.2          | -0.2 ± 0.2     | -1.4 ± 1.9          | -10.4 ± 8.0     | GA01688 |
| RWD2C      | -9.1        | 124.8        | -0.9          | 0.6 ± 1.5      | -1.9± 1.6           | -15.5 ± 7.3     | GA01689 |
| RCB12      | 1.6         | 667.5        | -1.2          | -0.2 ± 0.2     | -1.4 ± 1.9          | -10.8 ± 8.0     | GA01690 |
| RCC16      | 1.6         | 988.8        | -1.2          | -0.2 ± 0.2     | 0.8 ± 2.9           | -13.2 ± 8.0     | GA01691 |
| RWA2C      | -9.1        | 124.8        | -1.3          | -0.2 ± 0.2     | 1.4 ± 3.1           | $-15.0 \pm 7.8$ | GA01692 |
| RWD2C      | 1.6         | 124.8        | -1.3          | -0.2 ± 0.2     | 0.8 ± 2.9           | -14.9 ± 8.0     | GA01693 |
| RWK9C      | 12.3        | -30.3        | -1.5          | 0.6 ± 1.5      | -0.8 ± 2.2          | -13.8 ± 8.0     | GA01694 |
| RWK15C     | 1.6         | 235.6        | -1.4          | -0.2 ± 0.2     | -0.8 ± 2.2          | -10.0 ± 8.3     | GA01695 |
| QA         | N/A         | N/A          | N/A           | -0.2 ± 0.2     | 3.0 ± 3.6           | -13.0 ± 9.1     | GA01696 |

|            | F           | ort Meade,  | Building | 2802 (Random | Above Two Me        | ters)        |              |
|------------|-------------|-------------|----------|--------------|---------------------|--------------|--------------|
| Location   | 1           | Monitoring  |          | 1            | T                   |              |              |
| Code       | Alpha       | Beta        | Gamma    | Alpha        | Beta                | LS           | Wipe         |
| (Units =>) | dpm/100cm^2 | dpm/100cm^2 | uR/hr    | dp           | m/100cm^2 +/- 2 sig | gma          | Number       |
| (Bkgd =>)  | 1.7         | 149.47      | 5.00     | 0.1          | 2.0                 | 24.9         | 1            |
| (MDA =>).  | 54          | 401         | -        | 2.4          | 2.4                 | 21.9         | <b>-</b>   ` |
| RCA5       | 1.6         | 313.1       | -1.6     | 0.3 ± 1.1    | 1.4 ± 2.4           | -25.1 ± 9.9  | GA01635      |
| RCB4       | 1.6         | 25.1        | -0.9     | -0.3 ± 0.2   | -0,7 ± 1.5          | -25.1 ± 8.9  | GA01636      |
| RCD4       | 1.6         | 279.9       | -0.6     | -0.3 ± 0.2   | 0.9 ± 2.2           | -22.9 ± 8.8  | GA01637      |
| RCD6       | -9.1        | 512.5       | -0.8     | -0.3 ± 0.2   | -0.3 ± 1.7          | -22.5 ± 8.9  | GA01638      |
| RWA1C      | -9.1        | -118.9      | -0.8     | -0.3 ± 0.2   | -0.7 ± 1.5          | -22.9 ± 8.8  | GA01639      |
| RWB3C      | 1.6         | 47.3        | -0.8     | , -0.3 ± 0.2 | 0.1 ± 1.9           | -22.1 ± 9.1  | GA01640      |
| RWC7C      | 1.6         | 302.0       | -1.1     | -0.3 ± 0.2   | 0.1 ± 1.9           | -26.7 ± 10.1 | GA01641      |
| RWC4C      | 1.6         | -63.5       | -1.4     | -0.3 ± 0.2   | -0.7 ± 1.5          | -22.9 ± 8.6  | GA01642      |
| RWC5C      | -9.1        | -207.5      | -1.7     | 0.3 ± 1.1    | 0.9 ± 2.2           | -21.8 ± 9.9  | GA01643      |
| RWC1C      | 1.6         | -74.6       | -1.6     | -0.3 ± 0.2   | 2.6 ± 2.8           | -22.4 ± 8.7  | GA01644      |
| RCB3       | -9.1        | 113.7       | -1.0     | -0.3 ± 0.2   | 1.4 ± 2.4           | -20.8 ± 9.0  | GA01645      |
| RWB1C      | -9.1        | 25.1        | -0.9     | -0.3 ± 0.2   | -0.7 ± 1.5          | -23.8 ± 8.8  | GA01646      |
| RWC3C      | 1.6         | -52.4       | -1.2     | -0.3 ± 0.2   | -0.3 ± 1.7          | -12.9 ± 7.8  | GA01647      |
| RWD4C      | 10.1        | 25.1        | -0.9     | -0.3 ± 0.2   | 0.9 ± 2.2           | -10.8 ± 8.0  | GA01648      |
| QA         | N/A         | N/A         | N/A      | -0.3 ± 0.2   | -0.3 ± 1.7          | -10.4 ± 8.0  | GA01649      |
| RWA3C      | -9.1        | -107.8      | -1.1     | -0.3 ± 0.2   | -1.2 ± 1.2          | -13.3 ± 7.7  | GA01650      |
| RCB1       | -9.1        | 213.4       | -1.1     | 0.3 ± 1.1    | 0.5 ± 2.1           | -15.9 ± 8.3  | GA01651      |
| RCC3       | -9,1        | 556.8       | -0.9     | -0.3 ± 0.2   | 0.9 ± 2.2           | -10.2 ± 8.3  | GA01652      |
| RCD2       | -9.1        | 778.3       | -0.7     | 0.3 ± 1.1    | -0.3 ± 1.7          | -12.1 ± 7.9  | GA01653      |
| RCB4       | -9.1        | 601.1       | -0.9     | -0.3 ± 0.2   | 0.9 ± 2.2           | -15.4 ± 7.5  | GA01654      |
| RCE4       | 22.9        | 1276.8      | -1.1     | -0.3 ± 0.2   | 1.4 ± 2.4           | -14.5 ± 7.8  | GA01655      |
| RWA3C      | 1.6         | 146.9       | -1.7     | -0.3 ± 0.2   | 0.1 ± 1.9           | -14.7 ± 7.4  | GA01656      |
| RWC1C      | -9.1        | 468.2       | -1.6     | -0.3 ± 0.2   | 1.4 ± 2.4           | -8.3 ± 8.2   | GA01657      |
| RWE5C      | -9.1        | 102.6       | -1.5     | -0.3 ± 0.2   | 3.5 ± 3.0           | -10.0 ± 8.1  | GA01658      |
| RWE3C      | 22.9        | -74.6       | -1.4     | -0.3 ± 0.2   | -0.7 ± 1.5          | -9.8 ± 8.3   | GA01659      |
| RWF1C      | 22.9        | -152.1      | -1.1     | -0.3 ± 0.2   | 0.5 ± 2.1           | -10.0 ± 8.1  | GA01660      |
| RWF2C      | 1.6         | 235.6       | -1.3     | -0.3 ± 0.2   | 1.4 ± 2.4           | -8.9 ± 8.4   | GA01661      |
| RWG4C      | -9.1        | -30.3       | -1.5     | -0.3 ± 0.2   | 0.1 ± 1.9           | -14.3 ± 8.0  | GA01662      |
| RWA2C      | -9.1        | 124.8       | -1.5     | -0.3 ± 0.2   | 1.4 ± 2.4           | -13.6 ± 7.9  | GA01663      |
| RWA2C      | 22.9        | 169.1       | -1.2     | 0.6 ± 1.5    | -1.9 ± 1.6          | -8.9 ± 8.4   | GA01664      |
| RWC3C      | -9.1        | 91.6        | -1.3     | -0.2 ± 0.2   | 2.5 ± 3.4           | -9.8 ± 8.3   | GA01665      |

# APPENDIX D

RELEASE GUIDELINES

| Nuclidesª                                                                                                                                                             | Average <sup>b,c,f</sup><br>(dpm/100cm <sup>2</sup> ) | Maximum <sup>b,d,f</sup><br>(dpm/100cm <sup>2</sup> ) | Removable <sup>b,e,f</sup><br>(dpm/100cm <sup>2</sup> ) |  |  |  |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------|---------------------------------------------------------|--|--|--|--|
| U-Nat, <sup>235</sup> U, <sup>238</sup> U, and associated products                                                                                                    | 5,000 α                                               | 15,000 α                                              | <u>1</u> ,000 α                                         |  |  |  |  |
| Transuranics, <sup>226</sup> Ra, <sup>228</sup> Ra, <sup>230</sup> Th,<br><sup>228</sup> Th, <sup>231</sup> Pa, <sup>227</sup> Ac, <sup>125</sup> I, <sup>129</sup> I | 100                                                   | <u>∖</u> 300                                          | 20                                                      |  |  |  |  |
| Th-nat, <sup>232</sup> Th, <sup>90</sup> Sr, <sup>223</sup> Ra, <sup>224</sup> Ra,<br><sup>232</sup> U, <sup>126</sup> I, <sup>131</sup> I, <sup>133</sup> I          | 1,000                                                 | 3,000                                                 | 200                                                     |  |  |  |  |
| Beta/gamma emitters(nuclides<br>with decay modes other than<br>alpha emission or<br>spontaneous fission) except<br><sup>90</sup> Sr and other noted above             | 5,000 βγ                                              | 15,000 βγ                                             | 1,000 βγ                                                |  |  |  |  |

Acceptable Surface Contamination Levels

a Where surface contamination by both alpha- and beta/gamma-emitting nuclides exists, the limits established for alpha-and beta/gamma-emitting nuclides should apply independently

 $b \rightarrow As$  used in this table dpm (disintegrations per minute) means the rate of emission by radioactive material as determined by correcting the counts per minute observed by an appropriate detector for background, efficiency, and geometric factors associated with the instrumentation.

 $c \rightarrow$  Measurements of average contaminant should not be averaged over more than 1 square meter. For objects of less surface area, the average should be derived for each such object

d→ The maximum contamination level applies to an area of not more than 100 cm<sup>2</sup> e→ The amount of removable radioactive material per 100 cm<sup>2</sup> of surface area should be determined by wiping that area with dry filter or soft absorbent paper, applying moderate pressure, and assessing the amount of radioactive material on the wipe with an appropriate instrument of known efficiency. When removable contamination on objects of less surface area is determined, then pertinent levels should be reduced proportionally and the entire surface should be wiped.

f→ The average and maximum radiation levels associated with surface contamination resulting from beta-gamma emitters should not exceed 0.2 mrad/hr at 1 cm and 1.0 mrad/hr at 1 cm, respectively, measured through not more than 7 milligrams per square centimeter of total absorber.

Reference: Guidelines for Decontamination of Facilities and Equipment prior to Release for Unrestricted use or Termination of Licenses for Byproducts, Source, or Special Nuclear Material, U.S. Nuclear Regulatory Commission, April 1993.

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# APPENDIX E

# INSTRUMENTATION USED AT FORT MEADE

E-1

|                              | Alpha             | Beta              | Gamma            |
|------------------------------|-------------------|-------------------|------------------|
| Readout Make                 | LUDLUM            | LUDLUM            | LUDLUM           |
| Readout Model                | 2350              | 2350              | 2350             |
| Serial Number                | 120600            | 120623            | 120605           |
| Probe Make                   | LUDLUM            | LUDLUM            | LUDLUM           |
| Probe Model<br>Serial number | 43-68<br>PR122118 | 43-68<br>PR120552 | 44-2<br>RN139798 |

# Instrumentation used at Fort Meade Termination Survey

Scanning Instrumentation used at Fort Meade Termination Survey

|                        | Floor Scanner | Alpha/Beta |   |
|------------------------|---------------|------------|---|
| Readout Make           | Ludlum        | Ludlum     | · |
| Readout Model          | 2224          | 2224       |   |
| Serial Number          | 119772        | 119778     |   |
| Probe Make             | LUDLUM        | Ludlum     |   |
| Probe Model            | 43-37         | 43-1-1     |   |
| Probe Serial<br>Number | PR11637       | PR133820   |   |

All instrumentation was supplied by USACHPPM and the calibration is traceable to the National Institute of Standards and Technology.

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# APPENDIX F

# QUALITY ASSURANCE RESULTS

F-1

### 1. Spiked Samples. See table below.

#### Tritium Spikes

| Position Identification | DPM<br>added | DPM<br>found | Percent<br>Recovery |
|-------------------------|--------------|--------------|---------------------|
| H-3 GA00450             | 497          | 475.9        | 95.8%               |
| H-3 GA01696             | 0            | -13.0        | N/A                 |

Note: Each sample vial was packed inside a second vial to protect from spread of contamination if broken.

a. The percent recovery of the samples was within the recommended plus or minus 20 percent (80% to 120%).

2. Blank Wipe Samples. Survey teams randomly submitted blank samples to the laboratory. Sample GA01696 was submitted as a blank. The blank sample had no detectable activity above the detection limit.

# APPENDIX G

# INSTRUMENT QUALITY ASSURANCE CHARTS



|    | Daily Alpha Checks in counts |       |                                       |       |       |          |      |         |     |      |
|----|------------------------------|-------|---------------------------------------|-------|-------|----------|------|---------|-----|------|
| ·  | Date                         | Gross | BKG                                   | NET   | GROSS | BKG      | NET  | GROSS   | BKG | NET  |
| 1  | 13Aug97                      |       | ·                                     | 0     | 3248  | · 1      | 3247 | . 3345  | 2   | 3343 |
| 2  | 14Aug97                      | 3197  | 1                                     | 3196  | 3281  | 1        | 3280 | 3329    | 1   | 3328 |
| 3  | 15Aug97                      | 3182  | 1                                     | 3181  | 3257  | 3        | 3254 |         | •   | 0    |
| 4  | 18Aug97                      | 3240  | 1                                     | 3239  | 3257  | 2        | 3255 | 3341    | 1   | 3340 |
| 5  | 19Aug97                      | 3257  | 1                                     | 3256  | 3341  | 2        | 3339 |         |     | 0    |
| 6  | 20Aug97                      | 3278  | 1                                     | 3277  | 3267  | 1        | 3266 | 3372    | 1   | 3371 |
| 7  | 21Aug97                      | 3233  | 1                                     | 3232  | 3338  | 2        | 3336 | 3215    | 1   | 3214 |
| 8  | 22Aug97                      | 3246  | 3                                     | 3243  | 3325  | 1        | 3324 |         |     | 0    |
| 9  | 25Aug97                      | 3289  | · · · · · · · · · · · · · · · · · · · | 3289  | 3344  | 3        | 3341 | 3389    | 2   | 3387 |
| 10 | 26Aug97                      | 3259  | 2                                     | 3257  | 3345  | 2        | 3343 | 3328    | .1  | 3327 |
| 11 | 27Aug97                      |       |                                       | 0     |       |          | 0    | 1.1     |     | 0    |
| 12 | 28Aug97                      |       |                                       | 0     |       |          | 0    |         |     | 0.   |
| 13 | 1                            |       |                                       | 0     |       |          | 0.   | ·       |     | 0    |
| 14 |                              |       |                                       | 0     |       |          | 0    |         | · · | 0    |
| 15 |                              |       |                                       | 0     |       |          | 0.   |         |     | 0    |
| 16 |                              |       |                                       | 0     |       |          | 0    |         |     | 0    |
| 17 |                              |       |                                       | 0     | · .   |          | 0    |         |     | 0    |
| 18 |                              |       |                                       | 0     |       | <u> </u> | 0    |         |     | 0    |
| 19 | )                            |       |                                       | 0     |       |          | 0    | L       |     | 0    |
| 20 | · ·                          |       |                                       | 0     |       | <u> </u> | 0    |         |     | 0    |
| 21 |                              |       |                                       | 0     |       | 1        | . 0  |         | L   | 0    |
| 22 | 2                            |       |                                       | 0     |       |          | 0    | ·       | ·   | 0    |
| 23 | 3                            |       |                                       | 0     |       |          | 0    |         |     | 0    |
| 24 |                              |       |                                       | 0     |       |          | 0    |         |     | 0    |
| 25 | 5                            |       |                                       | . 0 . |       |          | -0   |         |     | 0    |
| 26 | 6                            |       |                                       | 0     |       |          | 0    | · · · · |     | 0    |
| 27 | 7                            |       |                                       | 0     |       | · · ·    | 0    |         |     | 0    |
| 28 | 3                            |       |                                       | 0     |       |          | 0    | J       |     | 0    |
| 29 | 9                            |       |                                       | 0     | · .   |          | 0    | · .     |     | 0    |
| 30 |                              |       |                                       | 0     |       |          | 0    |         |     | 0    |



|    |                |       | 2   | Daily BE | TA Check  | s in cou | unts |       |     | (    |
|----|----------------|-------|-----|----------|-----------|----------|------|-------|-----|------|
| :  | Date           | Gross | BKG | NET      | GROSS     | BKG      | NET  | GROSS | BKG | NET  |
| 1  | 13Aug97        |       |     | 0        | 2799      | 180      | 2619 | 2815  | 202 | 2613 |
| 2  | 14Aug97        | 2881  | 201 | 2680     | 2785      | 209      | 2576 | 2805  | 204 | 2601 |
| 3  | 15Aug97        | 2708  | 117 | 2591     | 2618      | 105      | 2513 |       |     | 0    |
| 4  | 18Aug97        | 2766  | 185 | 2581     | 2741      | 184      | 2557 | 2731  | 165 | 2566 |
| 5  | 19Aug97        | 2876  | 188 | 2688     | 2758      | 193      | 2565 |       |     | 0    |
| 6  | 20Aug97        | 2854  | 209 | 2645     | 2811      | 137      | 2674 | 2629  | 183 | 2446 |
| 7  | 21Aug97        | 2809  | 149 | 2660     | 2767      | 174      | 2593 | 2725  | 191 | 2534 |
| 8  | 22Aug97        | 2799  | 202 | 2597     | 2780      | 189      | 2591 |       | •   | 0    |
| 9  | 25Aug97        | 2759  | 204 | 2555     | 2690      | 162      | 2528 | 2598  | 189 | 2409 |
| 10 | 26Aug97        | 2840  | 198 | 2642     | 2778      | 201      | 2577 | 2834  | 185 | 2649 |
| 11 | 27Aug97        |       |     | 0        |           | · · .    | 0    |       |     | 0    |
| 12 |                |       |     | 0        | · · · · · |          | 0    |       |     | 0    |
| 13 | and the second |       |     | 0        |           | •        | 0    |       |     | 0 -  |
| 14 |                |       |     | 0        |           |          | 0    |       |     | 0    |
| 15 | 1. A. A.       |       |     | 0        |           |          | 0    |       |     | 0    |
| 16 |                |       |     | 0        |           |          | 0    |       |     | 0    |
| 17 |                |       |     | 0        |           |          | 0    |       |     | 0    |
| 18 |                |       |     | · 0 ·    |           |          | 0    |       |     | 0    |
| 19 |                |       |     | 0        |           |          | 0    |       | · · | 0    |
| 20 |                |       |     | 0        |           |          | 0    |       |     | 0    |
| 21 | •              |       |     | 0        |           |          | : 0  |       |     | 0    |
| 22 | · .            |       |     | 0        |           |          | 0    |       |     | 0    |
| 23 |                |       |     | 0        |           |          | 0    |       |     | 0    |
| 24 |                |       |     | 0        |           |          | . 0  |       |     | 0    |
| 25 |                |       |     | 0        |           |          | 0    |       |     | 0    |
| 26 |                |       |     | 0        |           |          | 0    |       |     | 0    |
| 27 |                |       |     | 0        |           |          | 0    |       |     | 0    |
| 28 |                | · · · |     | 0        |           |          | 0    |       |     | 0    |
| 29 |                |       |     | 0        |           |          | 0    |       |     | 0    |
| 30 |                |       |     | 0        |           |          | 0    |       |     | 0    |

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|    |         |       | D           | aily GA | MMA Chec | ks in ι | ıR/hr |       |          |     |
|----|---------|-------|-------------|---------|----------|---------|-------|-------|----------|-----|
|    | Date    | Gross | BKG         | NÉT     | GROSS    | BKG     | NET   | GROSS | BKG      | NET |
| 1  | 13Aug97 | 457   | 6           | 451     | 436      | 5       | 431   | 438   | 7        | 431 |
| 2  | 14Aug97 | 438   | 6           | 432     | 440      | 7       | 433   | 450   | 5        | 445 |
| 3  | 15Aug97 | 445   | 5           | 440     | 447      | 6       | 441   | 539   | 5        | 534 |
| 4  | 18Aug97 | 450   | 5           | 445     | 434.     | -5      | 429   | 450   | 5        | 445 |
| 5  | 19Aug97 | 463   | 7           | 456     |          |         | 0     |       |          | . 0 |
| 6  | 20Aug97 | 447   | 5           | 442     | 434      | 8       | 426   | 445   | 5        | 440 |
| 7  | 21Aug97 | 443   | 7           | 436     | 437      | 5       | 432   | 445   | 5        | 440 |
| 8  | 22Aug97 | 463   | 5           | 458     | 460      | 5       | 455   | i.    |          | 0   |
| 9  | 25Aug97 | 450   | 6           | 444     | 449      | .6      | 443   | 430   | 7        | 423 |
| 10 | 26Aug97 | 459   | 5           | 454     | 435      | 6       | 429   | 440   | 6        | 434 |
| 11 | 27Aug97 | • .   |             | 0       |          |         | 0     | 1     |          | - 0 |
| 12 |         |       |             | 0       |          | · · ·   | 0     |       | · ·      | 0   |
| 13 |         | · .   |             | 0       |          |         | 0     |       |          | 0   |
| 14 |         |       |             | 0       |          |         | 0     |       |          | 0   |
| 15 |         |       |             | 0       |          | · .     | 0     |       |          | 0   |
| 16 |         | , ,   |             | 0       |          |         | 0     |       |          | 0   |
| 17 |         |       |             | 0       | •• •     |         | 0     |       |          | 0   |
| 18 |         |       |             | 0       |          |         | 0     | ·     | · · ·    | 0   |
| 19 |         |       |             | 0       |          |         | 0     |       |          | 0   |
| 20 |         |       | · · · · · · | 0       |          |         | 0     |       |          | 0   |
| 21 |         |       |             | 0       |          |         | 0     |       |          | 0   |
| 22 |         |       |             | 0       |          |         | 0     |       |          | 0   |
| 23 |         |       |             | . 0     |          |         | 0     |       |          | 0   |
| 24 |         |       |             | . 0     |          |         | 0     |       | · ·      | 0   |
| 25 |         |       |             | 0       |          |         | 0     |       |          | 0   |
| 26 |         |       |             | 0       |          |         | 0     |       |          | 0   |
| 27 |         |       |             | 0       |          | 1       | 0     |       |          | 0   |
| 28 |         |       |             | 0       |          |         | 0     |       |          | 0   |
| 29 |         |       |             | 0       |          | [       | 0     | 1     |          | 0   |
| 30 |         | 1     |             | 0       |          |         | 0     | 1     | <u> </u> | 0   |

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|      |               |                                       |           | Daily BE | TA Check                              | s in cou                              | Ints |                                         |          |      |
|------|---------------|---------------------------------------|-----------|----------|---------------------------------------|---------------------------------------|------|-----------------------------------------|----------|------|
|      | Date          | Gross                                 | BKG       | NET      | GROSS                                 | BKG                                   | NET  | GROSS                                   | BKG      | NET  |
| 1    | 22Aug97       | 2500                                  | 191       | 2309     | 2498                                  | 187                                   | 2311 | 2675                                    | 198      | 2477 |
| 2    | 25Aug97       | 2634                                  | 190       | 2444     | 2590                                  | 195                                   | 2395 | 2508                                    | 185      | 2323 |
| 3    | 26Aug97       | 2537                                  | 195       | 2342     | 2610                                  | 201                                   | 2409 | 2647                                    | 189      | 2458 |
| 4    | 27Aug97       | 2608                                  | 190       | 2418     | 2690                                  | 203                                   | 2487 | 2600                                    | 200      | 2400 |
| . 5  |               |                                       |           | 0        |                                       | ·                                     | 0    |                                         |          | 0    |
| -6   |               |                                       |           | 0        |                                       |                                       | 0    |                                         |          | 0    |
| 7    |               |                                       |           | 0        |                                       | :                                     | 0    |                                         |          | 0    |
| 8    |               |                                       |           | 0        |                                       |                                       | 0    |                                         |          | 0    |
| 9    |               | · ·                                   |           | 0        |                                       |                                       | 0    |                                         | · · ·    | 0    |
| 10   | a de la serie | . ·                                   | 1. A.     | · 0 ·    |                                       |                                       | · 0  |                                         | •        | 0    |
| - 11 | · · ·         | · .                                   |           | 0        |                                       |                                       | 0    |                                         |          | O    |
| 12   |               | 1                                     |           | 0        | <u>.</u>                              |                                       | 0    | 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - | :        | 0    |
| 13   |               |                                       | · .       | 0        | and the second second                 |                                       | 0    | · · · · ·                               |          | 0    |
| 14   |               |                                       |           | 0        |                                       |                                       | 0    |                                         |          | 0    |
| 15   |               | '                                     |           | 0        |                                       | 10 m                                  | 0    |                                         |          | 0    |
| 16   |               | ·                                     |           | 0        |                                       | ·                                     | 0    | <u> </u>                                |          | 0    |
| 17   |               |                                       |           | 0        |                                       | ·                                     | 0.   | · · · · · · · · · · · · · · · · · · ·   |          | 0    |
| 18   |               |                                       | · · ·     | 0        |                                       |                                       | 0    |                                         |          | 0    |
| 19   |               |                                       |           | 0        |                                       |                                       | 0    | <u> </u>                                |          | 0    |
| 20   |               |                                       |           | 0        |                                       |                                       | 0    |                                         | <u> </u> | 0    |
| 21   |               | <u> </u>                              |           | 0        | <b></b>                               | ļ                                     | 0    |                                         | <u> </u> | 0    |
| 22   |               |                                       | · · · · · | 0        | · ·                                   | ļ                                     | 0    |                                         | · ·      | 0    |
| 23   |               |                                       |           | 0        |                                       | ļ                                     | 0    | ·                                       |          | 0    |
| 24   |               |                                       | · · · ·   | 0        |                                       |                                       | 0    |                                         | · · ·    | 0    |
| 25   |               | · · · · · · · · · · · · · · · · · · · |           | 0        |                                       | · · · · · · · · · · · · · · · · · · · | 0    | · · · · ·                               |          | 0    |
| 26   |               |                                       | <u> </u>  | 0        | · · · · · · · · · · · · · · · · · · · |                                       |      |                                         | ļ        | 0    |
| 27   | · · · · ·     |                                       |           | 0        |                                       | · · · ·                               | 0    |                                         | ·        | 0    |
| 28   |               | ·                                     |           | 0        | II                                    |                                       |      |                                         |          | 0    |
| 29   | <u>`</u>      |                                       |           | -0       | ·                                     | ŀ .                                   | 0    |                                         | L        | 0    |
| 30   | l             |                                       | l         | 0        | 1                                     |                                       | . 0  |                                         | 1        | 0    |

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MCHL-HP

#### MEMORANDUM FOR Record

SUBJECT: WRAIR Animal Holding Facility

1. Dr. Kenneth D. Burman called at 0830 on 8 August 1997 in response to our inquiry regarding the former Walter Reed Army Institute of Research (WRAIR) Animal Holding Facility.

2. This location has been specifically listed on NRC License 08-01738-02 since 1974. This location was added because of a research protocol conducted by Dr. Kenneth Burman to administer 15 to 20 micro-curies of Iodine-125 and Iodine-131 to pregnant sheep and perform surgery on the animals at that location.

3. Dr. Kenneth Burman indicated that only 5 to 10 sheep were used in this experiment which lasted about 2 months. Dr. Burman indicated that as far as he knows that was the only protocol using radioactive materials at the WRAIR Animal Holding Facility.

4. In September 1997 CPT Morton, MSG Mason and Mr. Muick from Walter Reed Army Institute of Research visited the site and conducted a meter survey of the trash area, the location where the barn was located and the pen where the sheep were held. No contamination above background was detected.

5. A thorough records investigation and telephone interviews by CPT Morton and Mr. Burton, Health Physics Office did not find any evidence of any other use of radioactive materials at this location.

6. Additional investigators involved in this protocol were CPT Jackson, Veterinarian of the WRAIR Animal Holding Facility, Dr. Leonard Wartofsky, Associate Investigator, and CPT J.D. Fox, Veterinarian.

ARTHUR R. MORTON CPT, MS Chief, Operations, HPO



This is to acknowledge the receipt of your letter/application dated

 $\frac{3/17/98}{1000}$ , and to inform you that the initial processing which includes an administrative review has been performed.

#### 08-01738-02

There were no administrative omissions. Your application was assigned to a technical reviewer. Please note that the technical review may identify additional omissions or require additional information.

Please provide to this office within 30 days of your receipt of this card

A copy of your action has been forwarded to our License Fee & Accounts Receivable Branch, who will contact you separately if there is a fee issue involved.

Your action has been assigned **Mail Control Number** When calling to inquire about this action, please refer to this control number. You may call us on (610) 337-5398, or 337-5260.

NRC FORM 532 (RI (6-98) Sincerely, Licensing Assistance Team Leader

| e                                                                                                                                                                                                                                                                                                                                    | ······································                                                                                                                                                                                           |                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                      |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| NRC F( RM 374                                                                                                                                                                                                                                                                                                                        | U.S. NUCLEAR REGULATO                                                                                                                                                                                                            | RY COMMISSION                                                                                                                                                                                | PAGE <u>1</u> OF <u>6</u> PAGES<br>Amendment No 71                                                                                                                                                                                                                                                                                   |
|                                                                                                                                                                                                                                                                                                                                      | MATERIALS L                                                                                                                                                                                                                      | ICENSE                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                      |
| Pursuant to the Atomic Energy Act of 195<br>of Federal Regulations, Chapter I, Parts<br>heretofore made by the licensee, a license<br>source, and special nuclear material des<br>deliver or transfer such material to persons<br>shall be deemed to contain the condition<br>applicable rules, regulations, and orders of<br>below. | 4, as amended, the Energy F<br>30, 31, 32, 33, 34, 35, 36, 3<br>is hereby issued authorizing<br>ignated below; to use such m<br>authorized to receive it in acc<br>s specified in Section 183 of<br>of the Nuclear Regulatory Co | Reorganization Act of 19<br>39, 40, and 70, and in r<br>g the licensee to receive<br>naterial for the purpose(<br>cordance with the regula<br>the Atomic Energy Act<br>mmission now or herea | 74 (Public Law 93-438), and Title 10, Code<br>eliance on statements and representations<br>acquire, possess, and transfer byproduct,<br>s) and at the place(s) designated below; to<br>tions of the applicable Part(s). This license<br>of 1954, as amended, and is subject to all<br>fter in effect and to any conditions specified |
| Licensee                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                  | In accordance with                                                                                                                                                                           | n the letter dated                                                                                                                                                                                                                                                                                                                   |
|                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                  | May 12, 1998,                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                      |
| 1. Department of the Army                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                  | 3. License number 0                                                                                                                                                                          | 8-01738-02 is amended in                                                                                                                                                                                                                                                                                                             |
| Walter Reed Army Medical Cen                                                                                                                                                                                                                                                                                                         | ter (WRAMC)                                                                                                                                                                                                                      | its entirety to read                                                                                                                                                                         | as follows:                                                                                                                                                                                                                                                                                                                          |
| 2.                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                  | 4. Expiration date Ju                                                                                                                                                                        | ine 30, 2004                                                                                                                                                                                                                                                                                                                         |
| Washington, D.C. 20307-5001                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                  | 5. Docket No. 030-0                                                                                                                                                                          | )1317                                                                                                                                                                                                                                                                                                                                |
|                                                                                                                                                                                                                                                                                                                                      | 2000 C                                                                                                                                                                                                                           | Reference No.                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                      |
| 6. Byproduct, source, and/or special nuclear material                                                                                                                                                                                                                                                                                | 7 Chemical and/or p                                                                                                                                                                                                              | physical form {                                                                                                                                                                              | <ul> <li>Maximum amount that licensee may possess at any one time under this license</li> </ul>                                                                                                                                                                                                                                      |
| A. Any byproduct material with atomic numbers 1-83                                                                                                                                                                                                                                                                                   | A. Any                                                                                                                                                                                                                           |                                                                                                                                                                                              | A. 400 millicuries of each<br>radionuclide with a total<br>possession limit of 26 curies                                                                                                                                                                                                                                             |
| B. lodine 131                                                                                                                                                                                                                                                                                                                        | B. Any                                                                                                                                                                                                                           |                                                                                                                                                                                              | 3. 2 curies                                                                                                                                                                                                                                                                                                                          |
| C. Xenon 133                                                                                                                                                                                                                                                                                                                         | C. Any                                                                                                                                                                                                                           | p 24 .C                                                                                                                                                                                      | 3 2 curies                                                                                                                                                                                                                                                                                                                           |
| D. Krypton 85                                                                                                                                                                                                                                                                                                                        | D. Any                                                                                                                                                                                                                           |                                                                                                                                                                                              | D. 1 curie                                                                                                                                                                                                                                                                                                                           |
| E. Phosphorus 32                                                                                                                                                                                                                                                                                                                     | E. Any                                                                                                                                                                                                                           |                                                                                                                                                                                              | E. 2 curies                                                                                                                                                                                                                                                                                                                          |
| F. Carbon 14                                                                                                                                                                                                                                                                                                                         | F. Any                                                                                                                                                                                                                           |                                                                                                                                                                                              | F. 2 curies                                                                                                                                                                                                                                                                                                                          |
| G. lodine 125                                                                                                                                                                                                                                                                                                                        | G. Any                                                                                                                                                                                                                           | (                                                                                                                                                                                            | G. 1 curie                                                                                                                                                                                                                                                                                                                           |
| H. Iridium 192                                                                                                                                                                                                                                                                                                                       | H. Any                                                                                                                                                                                                                           |                                                                                                                                                                                              | Н. []                                                                                                                                                                                                                                                                                                                                |
| I. Chromium 51                                                                                                                                                                                                                                                                                                                       | I. Any                                                                                                                                                                                                                           | I                                                                                                                                                                                            | . 750 millicuries                                                                                                                                                                                                                                                                                                                    |
| J. Sulfur 35                                                                                                                                                                                                                                                                                                                         | J. Any                                                                                                                                                                                                                           |                                                                                                                                                                                              | J. 1 curie                                                                                                                                                                                                                                                                                                                           |
| K. Hydrogen 3                                                                                                                                                                                                                                                                                                                        | K. Any                                                                                                                                                                                                                           | l                                                                                                                                                                                            | K. 5 curies                                                                                                                                                                                                                                                                                                                          |
| L. Molybdenum 99                                                                                                                                                                                                                                                                                                                     | L. Molybdenum 9<br>Technetium 99                                                                                                                                                                                                 | 9/<br>9m Generators                                                                                                                                                                          | L. 23 curies                                                                                                                                                                                                                                                                                                                         |
| M. Technetium 99m                                                                                                                                                                                                                                                                                                                    | M. Any                                                                                                                                                                                                                           | ·                                                                                                                                                                                            | M. 23 curies                                                                                                                                                                                                                                                                                                                         |
| N. Strontium 90                                                                                                                                                                                                                                                                                                                      | N. Sealed source                                                                                                                                                                                                                 | s                                                                                                                                                                                            | N.                                                                                                                                                                                                                                                                                                                                   |
| formation in this record was deleted                                                                                                                                                                                                                                                                                                 | ion -                                                                                                                                                                                                                            | 2                                                                                                                                                                                            | - KKIM                                                                                                                                                                                                                                                                                                                               |
| n accordance with the 2 + 4                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                  |                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                      |
| TOTA 2006-0238                                                                                                                                                                                                                                                                                                                       | OFFICIAL RECOR                                                                                                                                                                                                                   | RD COPY                                                                                                                                                                                      | ML10                                                                                                                                                                                                                                                                                                                                 |

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| NRC FORM 374A U.S. NL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                               | PAGE 2 of 6 PAGES                                                                      |  |  |  |  |
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| •                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                               | icense Number<br>18-01738-02                                                           |  |  |  |  |
| MATERIALS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                               | Docket or Reference Number<br>030-01317                                                |  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Ā                                             | mendment No. 71                                                                        |  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                               |                                                                                        |  |  |  |  |
| · · · · · · · · · · · · · · · · · · ·                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | ·                                             |                                                                                        |  |  |  |  |
| 6. Byproduct, source, and/or special<br>nuclear material                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 7. Chemical and/or physical fo                | m 8. Maximum amount that licensee may<br>possess at any one time under this<br>license |  |  |  |  |
| O. Cesium 137                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | O. Sealed sources                             | 0                                                                                      |  |  |  |  |
| P. Gadolinium 153                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | P. Sealed sources                             | P                                                                                      |  |  |  |  |
| Q. lodine 125                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Q. Sealed sources                             | Q. 1 curie                                                                             |  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | (3M Company seeds)                            |                                                                                        |  |  |  |  |
| R. lodine 125                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | R. Sealed sources<br>((Norland Inst. Co., Mod | R. 4 sources, not to exceed 300                                                        |  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 178A591A or AECL Mc                           | odels 🧭 🦾                                                                              |  |  |  |  |
| and the second s | Corp. Model IMC.P2)                           |                                                                                        |  |  |  |  |
| S. Cesium 137                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | S. Sealed sources                             | S.                                                                                     |  |  |  |  |
| T. Cobalt 60                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | T-Sealed sources                              | <b>T</b> .                                                                             |  |  |  |  |
| U. Americium 241 🔅                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | U. Any                                        | U. 100 microcuries                                                                     |  |  |  |  |
| V. Americium 241                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | V Sealed sources                              |                                                                                        |  |  |  |  |
| M. Niekol CO                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                               |                                                                                        |  |  |  |  |
| VV. NICKELOS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Y Scaled sources and for                      |                                                                                        |  |  |  |  |
| X. Thorium                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | X Any                                         | X. 5 kilograme                                                                         |  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                               | 7. 50 kilograma                                                                        |  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 2. Ally                                       |                                                                                        |  |  |  |  |
| AA. Cesium 137                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | AA Sealed sources                             |                                                                                        |  |  |  |  |
| BB. Americium 241                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | BE. Sealed sources                            | BB. s                                                                                  |  |  |  |  |
| CC. Cesium 137                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | CC. Sealed source                             | CC                                                                                     |  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                               |                                                                                        |  |  |  |  |
| DD. Paladium 103                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | DD. Sealed sources                            | DD. 3 curies                                                                           |  |  |  |  |
| EE. Uranium depleted in                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | EE. Plated Metal                              | EE. 400 Kilograms                                                                      |  |  |  |  |
| Uranium 235                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                               | ~                                                                                      |  |  |  |  |
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| , NRC FORM 374A U.S. NUCLEAR REGULATORY COMMISSION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | License Number<br>08-01738-02                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
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| MATERIALS LICENSE<br>SUPPLEMENTARY SHEET                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Docket or Reference Number<br>030-01317                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Amendment No. 71                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | · ·                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
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| 9. Authorized use:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| A. through DD. Medical diagnosis, therapy and research<br>Food and Drug Administration (FDA) requ<br>defined in 10 CFR 30.4, including animal<br>instruction.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | in humans in accordance with any applicable<br>uirements. Research and development as<br>studies; instrument calibration; student                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| CONDITIONS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | ××                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <ol> <li>Licensed material may be used only at the licensee's facilitie<br/>Center, Washington, D. C.; WRAMC Forest Glen Section a<br/>Medical Laboratory, WRAMC Department of Pathology, For<br/>Court, Rockville, Maryland and Gillette Building, 270 Resea<br/>Rockville, Maryland.</li> <li>A. Licensed material shall be used by, or under the super<br/>the Radiation Safety Committee, Colonel Yancy Phillips</li> <li>B. The use of licensed material in or on humans shall be<br/>in 10 CFR 35.2.</li> <li>C. Physicians, dentists, or podiatrists designated to use lid<br/>the training criteria established in 10 CFR 35, Subpart<br/>licensee's Radiation Safety Committee.</li> <li>D. The Radiation Safety Officer for this license is Colonel</li> <li>12. In addition to the possession limits in Item 8, the licensee sl<br/>material at a single location to quantities below the limits sp<br/>consideration of the need for an emergency plan for respon</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | es located at the Walter Reed Army Medical<br>nd Annex, Silver Spring, Maryland; U.S. Army<br>t Meade, Maryland; Rickman Building, 13 Taft<br>rch Center, 1413 Research Boulevard,<br>vision of individuals designated in writing by<br>s, Chairperson.<br>by a physician, dentist, or podiatrist as defined<br>censed material in or on humans shall meet<br>J and shall be designated in writing by the<br>William B. Johnson.<br>hall further restrict the possession of licensed<br>ecified in 10 CFR 30.72 which require<br>iding to a release of licensed material. |
| 13. Notwithstanding the requirements of 10 CFR 35.49(a) and the licensee may use for any medical use any byproduct material for medical use in according possess and use byproduct material for medical use in according the other sections of 10 CFR 35. This does not reapplicable U.S. Food and Drug Administration (FDA) and other sections of the other sec | (b), 35.100, 35.200, 35.300, 35.400 and 35.500<br>aterial or reagent kit. The licensee shall<br>ordance with the prescriptive and performance<br>elieve the licensee from complying with<br>ther Federal and State requirements.                                                                                                                                                                                                                                                                                                                                          |
| <ol> <li>A. Detector cells containing a titanium tritide foil or a scar<br/>conjunction with a properly operating temperature cont<br/>temperatures from exceeding that specified in the certi<br/>32.210.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | idium tritide foil shall only be used in<br>rol mechanism which prevents the foil<br>ificate of registration referred to in 10 CFR                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

| , NRC FORM 374A |                     | 1 374A                                                                                                                                     | U.S. NUCLEAF                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | REGULATOR                                                                                               | Y COMMISSIO                                                                                        | N                                                                                         |                                                                                                     | PAG                                                                                                     | GE 4                                                               | of                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 6                                                 | PAGES                            |
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| •               | ·                   | MATERIALS LICENSE<br>SUPPLEMENTARY SHEET                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                         |                                                                                                    |                                                                                           | or Reference N<br>1317                                                                              | Number                                                                                                  |                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | -<br>-<br>211                                     | · · · · · · · · · · · ·          |
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|                 | <u> </u>            | <u>.</u>                                                                                                                                   | · · · · · · · · · · · · · · · · · · ·                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                         |                                                                                                    | I                                                                                         | - <u></u>                                                                                           |                                                                                                         | <u> </u>                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                   | ··                               |
|                 | В.                  | When in use, de the outside.                                                                                                               | tector cells co                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | ntaining a ti                                                                                           | itanium triti                                                                                      | de foil or                                                                                | a scandiur                                                                                          | m tritide f                                                                                             | oil sha                                                            | ll be v                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | vente                                             | ed to                            |
| 15.             | The<br>devi<br>35.5 | licensee shall co<br>ces containing lic<br>00 and every six                                                                                | nduct a physic<br>censed materia<br>months for all                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | al inventory<br>I received a<br>other seale                                                             | y every thre<br>and posses<br>ed sources                                                           | e month<br>sed purs<br>and devic                                                          | s to accour<br>suant to 10<br>ces.                                                                  | nt for all s<br>CFR 35.                                                                                 | ealed<br>59, 35                                                    | souro<br>.400 :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | ces a<br>and                                      | and                              |
| 16.             | <b>A</b> .          | Sealed sources<br>contamination a<br>certificate of reg                                                                                    | and detector c<br>t intervals not t<br>istration referre                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | ells contain<br>o excéed si<br>ed to in 10 (                                                            | ing license<br>ix months<br>CFR 32.21                                                              | d materia<br>or at such<br>), not to a                                                    | al shall be<br>o other inte<br>exceed thre                                                          | tested for<br>rvals as a<br>ee years.                                                                   | leaka<br>are spo                                                   | ige ar<br>ecified                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | nd/or<br>d by                                     | the                              |
|                 | В.                  | Notwithstanding be tested for lea                                                                                                          | Paragraph A c<br>kage and/or cc                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | of this Cond<br>Intamination                                                                            | lition, seale<br>n at interva                                                                      | d source<br>Is not to                                                                     | es designed<br>exceed thr                                                                           | d to emit<br>ee month                                                                                   | alpha<br>Is.                                                       | partic                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | les s                                             | hall                             |
|                 | C.                  | In the absence of<br>months prior to the<br>be put into use u                                                                              | of a certificate (<br>he transfer, a subtraction of the state of the stat | rom a trans<br>sealed sour                                                                              | sferor indic<br>rce or dete                                                                        | ating that<br>ctor cell r                                                                 | à leak tes<br>eceived fro                                                                           | t has bee<br>om anothe                                                                                  | n mac<br>er pers                                                   | le wit<br>son sl                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | hin s<br>hall r                                   | ix<br>not                        |
|                 | D.                  | Each sealed sou<br>leakage, and co                                                                                                         | urce fabricated                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | by the licer<br>or to any us                                                                            | nsee shall<br>se or trans                                                                          | be inspec<br>er as a s                                                                    | ted and te                                                                                          | sted for c                                                                                              | onstru                                                             | uction                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | defe                                              | ects,                            |
|                 | E.                  | Sealed sources                                                                                                                             | and detector c                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | ells need no                                                                                            | ot be leak                                                                                         | èsted if:                                                                                 | بر<br>بن<br>بن                                                                                      |                                                                                                         |                                                                    | ener<br>Antonio de la composición<br>Antonio de la composición de | ·<br>· .                                          | · · .                            |
|                 |                     | <ul><li>(i) they conta</li><li>(ii) they conta</li></ul>                                                                                   | in only nydroge                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | n-3; or                                                                                                 |                                                                                                    |                                                                                           | <i>20</i>                                                                                           |                                                                                                         |                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                   |                                  |
|                 |                     | (iii) the half-life                                                                                                                        | e of the isotope                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | is 30 days                                                                                              | or less; or                                                                                        | ×                                                                                         | <b>S</b> F                                                                                          | •                                                                                                       |                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                   | •                                |
|                 |                     | (iv) they conta<br>than 10 mi                                                                                                              | in not more that<br>crocuries of al                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | ın 100 micro<br>pha emitting                                                                            | ocuries of<br>g material;                                                                          | oeta and/<br>or                                                                           | or gamma                                                                                            | emitting                                                                                                | mater                                                              | ial or                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | not r                                             | nore                             |
|                 | '                   | (v) they are no<br>when they<br>tested with<br>sealed sou<br>tested for                                                                    | ot designed to<br>are removed f<br>in the required<br>urce or detecto<br>leakage and/or                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | emit alpha p<br>rom storage<br>leak test in<br>r cell shall t<br>contamina                              | particles, a<br>e for use of<br>nterval, the<br>be stored fo<br>tion.                              | re in stora<br>transfer<br>/ shall be<br>or a perio                                       | age, and a<br>to another<br>tested bef<br>d of more                                                 | re not be<br>person, a<br>fore use o<br>than 10 y                                                       | ing us<br>and ha<br>or tran<br>ears w                              | ed. H<br>ave no<br>sfer.<br>vithou                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | lowe<br>ot be<br>No<br>It bei                     | ver,<br>en<br>ng                 |
|                 | F.                  | The test shall be<br>test sample. If t<br>a report shall be<br>shall be remove<br>accordance with<br>leak test result i<br>Nuclear Materia | <ul> <li>capable of de he test reveals</li> <li>filed with the l d immediately</li> <li>Commission</li> <li>known with the last safety Brandal</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | tecting the<br>the presen<br>J.S. Nuclea<br>from service<br>regulations.<br>ne U.S. Nuc<br>ch, 475 Alle | presence of<br>ace of 0.00<br>ar Regulato<br>e and deco<br>. The repo<br>clear Regul<br>endale Roa | of 0.005 r<br>5 microcu<br>ry Comm<br>Intaminal<br>Int shall be<br>atory Cor<br>d, King o | nicrocurie<br>irie or more<br>ission and<br>ed, repaire<br>filed withi<br>mmission,<br>f Prussia, f | of radioa<br>e of remo<br>l the sour<br>ed, or dis<br>ed, or dis<br>n five da<br>Region I,<br>Pennsylva | ctive n<br>vable<br>ce or c<br>bosed<br>ys of tl<br>ATTN<br>ania 1 | nateri<br>conta<br>detect<br>of in<br>ne da<br>I: Ch<br>9406                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | al or<br>amina<br>tor co<br>te th<br>ief,<br>. Th | n the<br>ation,<br>ell<br>e<br>e |

| ) NRC   | FORM 374A U.S. NUCLEAR REGULATORY COMMISSION                                                                                                                                                                                                                                                                                                                                                                                                                                                    | PAGE 5 of 6 PAGES                                                                                                                                                                             |
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|         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | License Number<br>08-01738-02                                                                                                                                                                 |
| •       | MATERIALS LICENSE<br>SUPPLEMENTARY SHEET                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Docket or Reference Number<br>030-01317                                                                                                                                                       |
|         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Amendment No. 71                                                                                                                                                                              |
| <u></u> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                               |
|         | report shall specify the source or detector cell involved                                                                                                                                                                                                                                                                                                                                                                                                                                       | l, the test results, and corrective action taken.                                                                                                                                             |
|         | G. The licensee is authorized to collect leak test samples tests for leakage and/or contamination may be perform Commission or an Agreement State to perform such s                                                                                                                                                                                                                                                                                                                             | for analysis by the licensee. Alternatively,<br>ned by persons specifically licensed by the<br>ervices.                                                                                       |
| 17.     | Sealed sources or detector cells containing licensed mater<br>from source holders by the licensee.                                                                                                                                                                                                                                                                                                                                                                                              | ial shall not be opened or sources removed                                                                                                                                                    |
| 18.     | The licensee is authorized to hold radioactive material with<br>Sulfur 35, Cobalt 58, Iridium 192, Scandium 46, for decay-i<br>provided:                                                                                                                                                                                                                                                                                                                                                        | a physical half-life of less than 65 days and<br>n-storage before disposal in ordinary trash,                                                                                                 |
| · .     | A. Waste to be disposed of in this manner shall be held f                                                                                                                                                                                                                                                                                                                                                                                                                                       | or decay a minimum of ten half-lives.                                                                                                                                                         |
|         | <ul> <li>B. Before disposal as ordinary trash, the waste shall be a appropriate survey instrument set on its most sensitive determine that its radioactivity cannot be distinguished removed or obliterated.</li> <li>C. A record of each such disposal permitted under this Livears. The record must include the date of disposal, the placed in storage, the radionuclides disposed, the surface of each waste the dose rate measured at the surface of each waste of the surface.</li> </ul> | cense Condition shall be retained for three<br>he date on which the byproduct material was<br>vey instrument used, the background dose rate,<br>container, and the name of the individual who |
|         | performed the disposal.                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                               |
| . 19.   | Experimental animals, or the products from experimental a materials shall not be used for human consumption                                                                                                                                                                                                                                                                                                                                                                                     | nimals, that have been administered licensed                                                                                                                                                  |
| 20.     | The licensee shall possess and use byproduct material for prescriptive and performance criteria in all sections of 10 C 35.100, 35.200, and 35.300.                                                                                                                                                                                                                                                                                                                                             | human research in accordance with the<br>FR Part 35 except sections 35.49(a) and (b),                                                                                                         |
| 21.     | The licensee is authorized to transport licensed material in 71, "Packaging and Transportation of Radioactive Material                                                                                                                                                                                                                                                                                                                                                                          | accordance with the provisions of 10 CFR Part<br>"                                                                                                                                            |
| 22.     | The licensee shall not acquire licensed material in a sealed<br>has been registered with the U.S. Nuclear Regulatory Com<br>equivalent regulations of an Agreement State.                                                                                                                                                                                                                                                                                                                       | source or device unless the source or device mission pursuant to 10 CFR 32.210 or                                                                                                             |
| 23.     | Radioactive waste generated shall be stored in accordance<br>procedures included with the waste storage plan described<br>September 9, 1993 and October 29, 1993.                                                                                                                                                                                                                                                                                                                               | e with the statements, representations, and<br>I in the licensee's letter/application dated                                                                                                   |
|         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                               |

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|          | <u> </u>                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                           |  |  |  |  |
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| NRC      | FORM 374A                   | U.S. NUCLEAR REGULATORY COMMISSION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | PAGE 6 of 6 PAGES                                         |  |  |  |  |
|          |                             | · -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | License Number<br>08-01738-02                             |  |  |  |  |
| <b>.</b> |                             | MATERIALS LICENSE<br>SUPPLEMENTARY SHEET                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Docket or Reference Number<br>030-01317                   |  |  |  |  |
|          |                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Amendment No. 71                                          |  |  |  |  |
|          |                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                           |  |  |  |  |
|          |                             | ······································                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                           |  |  |  |  |
| 24       | Notwithstand                | ding the requirements of 10 CER 35 $315(a)(7)$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | the licensee may control contamination in                 |  |  |  |  |
|          | rooms used<br>procedures of | to house radiopharmaceutical therapy patients<br>contained in the letters dated April 8, 1992 and                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | in accordance with the commitments and November 24, 1992. |  |  |  |  |
| 25.      | Except as sp                | pecifically provided otherwise in this license. the                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | e licensee shall conduct its program in                   |  |  |  |  |
|          | accordance                  | with the statements, representations, and proc                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | edures contained in the documents, including              |  |  |  |  |
|          | provided in 1               | res, listed below, except for minor changes in the total of the termination of te | ne medical use radiation safety procedures as             |  |  |  |  |
|          | the statemer                | nts, representations, and procedures in the lice                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | nsee's application and correspondence are                 |  |  |  |  |
|          | more restrict               | tive than the regulations.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                           |  |  |  |  |
|          | A. Applicat                 | tion dated January 21, 1993                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                           |  |  |  |  |
|          | B. Letter d                 | ated September 9, 1993                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                           |  |  |  |  |
|          | C. Letter d                 | ated October 29, 1993<br>ated December 9, 1993                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                           |  |  |  |  |
|          | E. Letter d                 | ated February 15, 1994                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                           |  |  |  |  |
|          | F. Letter d                 | ated June 2, 1994                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                           |  |  |  |  |
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|          |                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | S S                                                       |  |  |  |  |
|          |                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                           |  |  |  |  |
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|          | · .                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                           |  |  |  |  |
| -        |                             | ****                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                           |  |  |  |  |
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|          |                             | For the U.S                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | S. Nuclear Regulatory Commission                          |  |  |  |  |
|          |                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                           |  |  |  |  |
| Dat      | te June 9                   | 1998 By                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | ginal signed by Michelle Beardsley                        |  |  |  |  |
|          |                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | chelle Beardsley                                          |  |  |  |  |
|          |                             | Nu                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | clear Materials Safety Branch 1                           |  |  |  |  |
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| 1        |                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                           |  |  |  |  |

#### June 9, 1998

Docket No. 030-01317 Control No. 125704 License No.

08-01738-02

William B. Johnson Colonel, U.S. Army Radiation Protection Officer Department of the Army Walter Reed Army Medical Center (WRAMC) MCHL-HP/Health Physics Office Building 41, Room 38 Washington, D.C. 20307-5001

Dear Colonel Johnson:

This refers to your license amendment request. Enclosed with this letter is the amended license.

Please review the enclosed document carefully and be sure that you understand and fully implement all the conditions incorporated into the amended license. If there are any errors or questions, please notify the U.S. Nuclear Regulatory Commission, Region I Office, Licensing Assistance Team, (610) 337-5093 or 5239, so that we can provide appropriate corrections and answers.

Thank you for your cooperation.

Sincerely,

Original signed by Michelle Beardsley

Michelle Beardsley Health Physicist Nuclear Materials Safety Branch 1 Division of Nuclear Materials Safety

Enclosure: Amendment No. 71

cc: Col. Eric Daxon, U.S. Army Medical Command

**ML10** 

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| DATE   | 06/09/98   |     | 06/ /98 | 06/ | /98 |  | 06/ / | 98 |  |

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W. Johnson Radiation Protection Officer 2

# 030-01317



#### DEPARTMENT OF THE ARMY WALTER REED ARMY MEDICAL CENTER WALTER REED HEALTH CARE SYSTEM WASHINGTON, DC 20307-5001

REPLY TO ATTENTION OF May 12, 1998

**Preventive Medicine Services** 

Nuclear Regulatory Commission, Region I Medical Licensing Division 475 Alendale Road King of Prussia, Pennsylvania 19406-1415

Dear Sir or Madam:

Walter Reed Army Medical Center (WRAMC) uses radioactive material authorized by U.S. Nuclear Regulatory Commission (NRC) Byproduct Material License number 08-01738-02 with an expiration date of June 30, 2004. This is a medical broadscope Type A license for medical diagnosis, therapy, and research in humans in accordance with any applicable Food and Drug Administration (FDA) requirements. Research and development as defined in 10 CFR 30.4, including animal studies; instrument calibration; and student instruction.

We request to amend NRC License 08-01738-02 issued to Walter Reed Army Medical Center (WRAMC), Washington, DC to appoint Colonel Yancy Phillips, replacing Colonel John R. Pierce, Deputy Commander for Clinical Services (DCCS), as the Chairman of the Radiation Control Committee (RCC). As the DCCS, Colonel Phillips is in a senior level executive management position, one level below the Hospital Commander, WRAMC. The Radiation Protection Officer, Colonel William B. Johnson has carefully reviewed the curriculum vitae (enclosure) and has recommended Colonel Phillips approval as Chairman of the RCC.

For additional information, please contact the undersigned at (202) 356-0058.

Sincerely,

William B. Johnson Colonel, U.S. Army Radiation Protection Officer

Enclosure

Copy Furnished:

Headquarters, U.S. Army Medical Command, ATTN: MCHO-CL-W (Colonel Daxon), 2050 Worth Road, Ft. Sam Houston, TX 78234-6000

MAY 1 9 1998

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| • .                              | CURRICULUM VITAE                                                                                                                                 | March 1998                                       |
|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|
| NAME:                            | Yancy Y Phillips, III                                                                                                                            |                                                  |
| SSAN:                            | $\begin{bmatrix} & \end{bmatrix}$                                                                                                                |                                                  |
| RANK:                            | Colonel, Medical Corps                                                                                                                           |                                                  |
| MOS:                             | 60F9A                                                                                                                                            |                                                  |
| DOB:                             |                                                                                                                                                  |                                                  |
| POB:                             |                                                                                                                                                  |                                                  |
| SPOUSE:                          |                                                                                                                                                  | Fig. 1                                           |
| CHILDREN:                        |                                                                                                                                                  | EX. b                                            |
| HOME ADDRESS                     | 3:                                                                                                                                               |                                                  |
|                                  |                                                                                                                                                  |                                                  |
| WORK ADDRESS                     | 5: Department of Medicine<br>Walter Reed Army Medica<br>Washington, DC 20307-50<br>202-782-6205/2348<br>FAX 202-782-6507<br>E-Mail: COL_YANCY_PH | Il Center<br>001<br>ILLIPS@WRAMC1-AMEDD.ARMY.MIL |
| EDUCATION:<br>1971 BS Chemic     | cal Engineering (High Honors                                                                                                                     | ), University of Delaware                        |
| 1974 Master of I                 | Medical Science, CMDNJ-Ru                                                                                                                        | tgers Medical School                             |
| 1976 Doctor of N                 | Medicine (Cum Laude), Unive                                                                                                                      | rsity of Alabama School of Medicine              |
| POST-GRADUAT<br>1976-77 Internal | TE EDUCATION:<br>Medicine Internship, Tripler A                                                                                                  | rmy Med Center, Honolulu, HI                     |
| 1977-79 Internal                 | Medicine Residency, Tripler                                                                                                                      | Army Medical Center                              |

1980-83 Pulmonary Medicine Fellowship, Walter Reed Army Medical Center Washington, D.C.

# ACADEMIC APPOINTMENTS:

| 1983-90 | Assistant Professor of Medicine, Uniformed Services University of the Health Sciences (USUHS), Bethesda, MD |
|---------|-------------------------------------------------------------------------------------------------------------|
| 1989-93 | Program Director, Pulmonary Disease Fellowship, WRAMC                                                       |
| 1990-   | Associate Professor of Medicine, USUHS                                                                      |
| 1993-   | Director, Internal Medicine Residency, WRAMC                                                                |
| 1993-   | Associate Chairman, Department of Medicine, USUHS                                                           |

CLINICAL AND PROFESSIONAL POSITIONS:

| 1971-72    | Chemical Engineer, Exxon Corporation, Linden, NJ                                                                    |
|------------|---------------------------------------------------------------------------------------------------------------------|
| 1979-80    | Internist and Chief, CCU, Dewitt Army Hospital, Ft Belvoir, VA                                                      |
| 1980-82    | Program Manager, Blast Overpressure Project, Non-Auditory, Walter Reed Army Institute of Research, Washington, D.C. |
| 1983-87    | Chief, Department of Respiratory Research, Walter Reed Army Institute of Research                                   |
| 1987-89    | Director, Medical Intensive Care Unit, Walter Reed Army Medical Center<br>(WRAMC)                                   |
| 1989-90    | Chief, Pulmonary Disease Service, WRAMC                                                                             |
| 1990-93    | Chief, Pulmonary & Critical Care Medicine Service, WRAMC                                                            |
| 1993- Chie | f Department of Medicine, WRAMC                                                                                     |

# SELECTED COMMITTEE POSITIONS AND CONSULTANCIES

- 1981-87 US Delegate, NATO Panel VIII, Research Study Group 6
- 1990-93 Pulmonary Consultant to the Surgeon General of the Army
- 1990-93 Respiratory Therapy Consultant to the Surgeon General of the Army
- 1992-95 Chairman, Mobilization and Readiness Committee, WRAMC

1993- Chairman, CQI Performance Improvement Council, WRAMC

1994- Chairman, Army Region American College of Physicians Annual Meeting

1994- NIH, National Heart, Lung and Blood Institute (NHLBI) Advisory Council

1994-96 NHLBI, Lung Division, Workshop on Planning a National Strategy for Chronic Obstructive Pulmonary Disease

1994- NHLBI, Lung Division, Data and Safety Monitoring Board for Lung Health Study 2

1997- DOD(HA) Working Group on Computerized Patient Record

- 1997 NHLBI and FDA sponsored Workshop on Pulmonary Artery Catheterization and Clinical Outcomes
- 1997- Pre-reviewer for Pulmonary and Critical Care Medicine fellowships for Accreditation Council for Graduate Medical Education (ACGME)

# HONORS AND AWARDS:

Omicron Delta Kappa Honor Society, Univ of Del, 1970 Alpha Omega Alpha, Univ of Alabama, 1975 Dean's Honor Award, UAH, 1976 Resident's Award for Outstanding Research, TAMC, 1979 Fellow, American College of Chest Physicians, 1987 Fellow, American College of Physicians, 1993 Chennault Award for Outstanding Teacher, WRAMC, 1993

#### BOARD CERTIFICATIONS:

Diplomate, National Board of Medical Examiners, 1977 Diplomate #72508, American Board of Internal Medicine, 1979 Diplomate in Pulmonary Disease, ABIM, 1984 Diplomate in Critical Care Medicine, ABIM, 1991 Diplomate of American Board Of Medical Management, 1996

# MEDICAL LICENSE:

Virginia 1979 to present, #11-030980 Louisiana 1985, #06724R DEA Number AP9479191

# **PROFESSIONAL SOCIETIES:**

American College of Chest Physicians, Fellow, 1987-present Governor for US Army, 1992-95

American College of Physicians, Fellow, 1990-present

American College of Physician Executives, Member, 1993- present American Thoracic Society, 1987-present

Chairman, Long Range Planning Committee of Clinical Problems Assembly, 1991-95

Member, Health Care Policy and Clinical Practice Committee, 1993-95 Member, Clinical Practice Committee, 1995-97

Writing Committee, Statement on "Evaluation and Care of the Patient with COPD", 1993-95

Association of Military Surgeons of US, 1981-present

Association of Program Directors of Internal Medicine, 1993-

Curriculum Review Ad Hoc Committee, 1996

Association of Pulmonary and Critical Care Medicine Program Directors, 1990-1993

District of Columbia Thoracic Society, 1987-1994

Executive Committee, 1989-1993

Co-Chairman American Lung Association of DC Research Committee 1992 & 1993

### EDITORIAL REVIEWER:

New England Journal of Medicine

American Journal of Respiratory and Critical Care Medicine

Chest

Pediatric Pulmonology

Journal of Respiratory Diseases

American Medical Association panel member for Diagnostic and Therapeutic

Technology Assessment

ABIM Pulmonary Disease Re-Certification, question preparation

# **MILITARY AWARDS:**

Department of the Army Research and Development Achievement Award for 1988 Meritorious Service Medal with 4 Oak Leaf Clusters Army Commendation Medal with 1 Oak Leaf Cluster Army Achievement Medal with 1 Oak Leaf Cluster Army Superior Unit Award (2) "A" Proficiency Designator for AOC 60F (Pulmonary Disease) Order of Military Medical Merit

# **MILITARY EDUCATION:**

AMEDD Officers Basic Course (Constructive Credit), 1979 AMEDD Officers Advanced Course (Constructive Credit), 1982 Combat Casualty Care Course (C4A), 1986 Armed Forces Staff College (In Residence), 1989 Medical Management of Chemical Casualties Course, 1990 PUBLICATIONS:

1. Laughlin E, Dorosin N, Phillips Y. Total parenteral nutrition: a guide to therapy in the adult. J Fam Pract 1977; 5:947.

2. Phillips YY, Lonigan M, Joyner L. A simple technique for managing a bronchopleural fistula while maintaining positive pressure ventilation. Crit Care Med 1979; 7:351.

3. Phillips YY, Copley JB, Stor RA. Thrombocytopenia and low dose heparin. Southern Med J 1983; 76:526.

4. Verma PS, Hoyt RF, Jackson AJ, Phillips YY. Pharmacokinetics of intravenously administered desmosine in sheep. Conn Tissue Res 1984; 12:191.

5. Young AJ, Jaeger JJ, Phillips YY, Yelverton JT, Richmond DR. The influence of airway pressure on lung injury resulting from airblast. Military Medicine 1985; 150:31-33.

6. Young AJ, Jaeger JJ, Phillips YY, Yelverton JT, Richmond DR. The influence of clothing on human intrathoracic pressure during airblast. Aviat Space Environ Med 1985; 56:49-53.

7. Phillips YY, Jaeger JJ, Laube BL, Rosenthal RR. Eucapnic hyperventilation of compressed gas mixture: a simple system for bronchial challenge by respiratory heat loss. Am Rev Respir Dis 1985; 131:31-35.

8. Young AJ, Jaeger JJ, Phillips YY, Fletcher ER and Richmond DR. Intrathoracic pressure in humans exposed to short duration airblast. Mil Med 1985; 150:483-6.

9. Young AJ, Hoyt RF, Jaeger JJ, Phillips YY, Richmond DR. Short duration airblast does not increase pulmonary microvascular permeability. Military Medicine 1986; 151, 3:139-143.

10. Hoyt RF, Hayre MD, Dodd KT, Phillips YY. Long-acting intramuscular anesthetic Regimen for swine. Lab Animal Science 1986; 36:413-15.

11. Phillips YY. Primary blast injuries. Annals of Emergency Medicine 1986; 15:1446-1450.

12. Stuhmiller JH, Chuong CJ, Dodd KT, Phillips YY. Computer modeling of thoracic response to blast. Journal of Trauma 1988; 28:S132-9.

13. Phillips YY, Mundie TG, Yelverton JT, Richmond DR. Cloth ballistic vest alters response to blast. Journal of Trauma 1988; 28:S149-52.
14. Harmon JW, Sampson JQ, Graeber GM, Phillips YY. Readily available serum biochemical markers fail to aid in diagnosis of blast injury. Journal of Trauma 1988: 28;S153-S159.

15. Phillips YY and Patterson JH. Protection against noise and blast. Medical Bulletin of the US Army Medical Department, PB 8-88-2, Feb 1988.

16. O'Hair KC, Dodd KT, Phillips YY, Beattie RJ. Cardiopulmonary effects of nalbuphine hydrochloride and butorphanol tartrate in sheep. Lab Animal Sciences 1988; 38:58-60.

17. Mundie TG, Pamplin CL, Phillips YY, Smallridge RC. The effect of exercise in sheep on the absorption of intramuscular atropine sulfate. Pharmacology 1988; 37:132-136.

18. McNeil JS, Torrington KG, Mundie TG, Ripple GR, Phillips YY. A steady state method of measuring carbon monoxide diffusing capacity of the lung of sheep. Lab Anim Sci 1989; 39:33-36.

19. Phillips YY, Mundie TG, Dodd KT. Middle ear injuries in animals exposed to complex blast waves inside an armored vehicle. Annals of Otology, Rhinology & Laryngology. 1989; 98(5,2):17-22.

20. Richmond DR, Yelverton JT, Fletcher ER, Phillips YY. Physical correlates of eardrum rupture. Annals of Otology, Rhinology & Laryngology. 1989; 98(5,2): 35-41.

21. Phillips YY and Zatjchuk JT. Blast injuries of the ear in military operations. Annals of Otology, Rhinology & Laryngology. 1989; 98(5,2):3-4.

22. Rayburn DB, Mundie TG, Rosenthal RR, Phillips YY. Computer controlled large animal pulmonary function system. Computer Methods and Programs in Biomedicine 1989; 28:1-9.

23. Phillips, YY; Ripple, GR; Dodd, KT; and Mundie, TG. Medical evaluation of live fire test injuries. Army Research, Development & Acquisition Bulletin Nov-Dec 1989:16-18.

24. Eliasson AE, Tenholder MF, Phillips YY. Treatment of lymphangiomyomatosis- a meta-analysis. Chest 1989; 196:1352-55.

25. Torrington KG, McNeil JS, Phillips YY, Ripple GR. Blood volume determination in sheep before and after splenectomy. Laboratory Animal Science 1989; 39:598-602.

26. Ripple GR, Torrington KG, Phillips YY. Predictive criteria for burns from brief thermal exposures. J Occup Med 1990; 32:215-9.

27. Duffy PE and Phillips YY. Caffeine consumption decreases the response to bronchoprovocation challenge with dry gas hyperventilation. Chest 1991; 99:1374-77.

28. McNeil JS, Torrington KG, Mundie TG, Ripple GR, Phillips YY, Banks RA. Prediction of carbon monoxide diffusing capacity of the lung in splenectomized sheep, Lab Animal Sci 1991, 41:63-66.

29. Tenholder MF, Rajagopal KR, Phillips YY, Dillard TA, et.al. Urinary desmosine excretion as a marker of lung injury in the adult respiratory distress syndrome. Chest 1991; 100:1385-1390.

30. Yu JH, Vasel EJ, Hoyt RF, Phillips YY, Dodd KT. Autologous perfusion of an isolated rabbit gastrointestinal tract. Lab Animal Sci 1991; 41:66-70.

31. Poropatich R and Phillips YY. Listeria brain abscess in long-standing sarcoidosis. Southern Med J 1992; 85:554-556.

32. Eliasson AE, Phillips YY, Rajagopal KR, Howard RS. Sensitivity and specificity of bronchial provocation testing. An evaluation of four techniques in exercise-induced bronchospasm. Chest 1992; 102:347-355.

33. Eliasson AE, Phillips YY, et. al. Oxygen consumption and ventilation during normal labor. Chest 1992; 102:467-471.

34. Landry FJ, Parker JM, Phillips YY. "Outcome of cardiopulmonary resuscitation in the intensive care setting". Arch Int Med 1992; 152:2305-2308.

35. Argyros GJ, Phillips YY, Rayburn DB, Rosenthal RR, Jaeger JJ. Water loss without heat flux in exercise-induced bronchospasm. Am Rev Resp Dis 1993; 147:1419-1424.

36. Roach JM, Eliasson AH, Phillips YY. The effect of pyridostigmine on bronchial hyper-reactivity. Chest 1993; 103:1755-58.

37. Parker JM, Landry FJ, Phillips YY. Use of do-not-resuscitate orders in an intensive care setting. Chest 1993; 104:1592-96.

38. Roach JM, Argyros GJ, Hurwitz KM, Argyros GJ, Eliasson AH, Phillips YY. Eucapnic voluntary hyperventilation as a bronchoprovocation technique: comparison with methacholine inhalation in asthmatics. Chest 1994; 105:667-672.

39. Hurwitz KM, Roach J, Argyros G, Eliasson AH, Phillips YY. Refractory period after during provocation with eucapnic hyperventilation and methacholine. Am J Resp Crit Care Med 1994; 149:1452-6.

40. Parker JM, Torrington KT, Phillips YY. Chylothorax in sarcoidosis. South Med J 1994; 87:860-2.

41. Parker JM, Dillard TA, Phillips YY. Impact of using stated versus measured height on screening spirometry. Am J Resp Crit Care Med 1994; 150:1705-8.

42. Dillard TA, Moores LK, Bilello KL and Phillips YY. The pre-flight evaluation: a comparison of the hypoxic inhalation test with hypobaric exposure. Chest 1995; 107:352-7.

43. Phillips YY. The development of practice guidelines in pulmonary medicine. Clin Pulm Med 1995; 2:224-230.

44. Argyros GJ, Roach JM, Hurwitz KM, Eliasson AH and Phillips YY. The refractory period after eucapnic voluntary hyperventilation challenge and it's effect on challenge technique. Chest 1995; 108:419-424.

45. Hurwitz KM, Argyros GJ, Roach JM, Eliasson AE, Phillips YY. Interpretation of eucapnic voluntary hyperventilation in the diagnosis of asthma. Chest 1995; 108:1240-1245.

46. American Thoracic Society. Standards for the diagnosis and care of patients with chronic obstructive pulmonary disease. Am J Respir Crit Care Med 1995; 152:S77-S120.

47. Knutson SW, Dillard TA, Mehm WJ, Phillips YY. Effect of upright and supine posture on hypoxemia during air transport. Aviat Space Envir Med 1996; Jan:14-18.

48. Glass KL, Dillard TA, Phillips YY, Torrington KG. Pulse oximetry correction for smoking exposure. Mil Med 1996; 161:273-276.

49. Argyros GJ, Phillips YY, Eliasson AE, Roach JM, Hurwitz K. Eucapnic voluntary hyperventilation as a bronchoprovocation technique: development of a standardized ventilatory dosing schedule in asthmatics. Chest 1996; 109:1520-1524.

50. Parker JM, Dillard TA, Phillips YY. Arm span:height relationships in a population of patients referred for spirometry. Am J Resp Crit Care Med 1996; 154:533-6.

51. Kim H, Lepler L, Daniels A, Phillips Y. Alpha 1-antitrypsin deficinecy and idiopathic pulmonary fibrosis in a family. South Med J 1996; 89:1008-10.

52. Eliasson AH, Howard RS, Torrington KG, Dillard TA, Phillips YY. Do-not resuscitate decisions in the medical ICU; comparing physician and nurse opinions. Chest 1997; 111:1106-11.

53. Argyros G, Pike J, Phillips YY. Bronchodilator therapy prior to elective fiberoptic bronchoscopy: an evaluation of ipratropium bromide and metaproterenol sulfate dispensed by metered dose inhaler. J of Bronchology 1997; 4:106-110.

54. Petty TL and Weinmann. Building a national strategy for the prevention and management of and research in chronic obstructive pulmonary disease--National Heart, Lung, and Blood Institute workshop summary. (section leader and author) JAMA, 1997; 277:246-253.

55. Heffner JE, Aitken M, Geist L, Osborne, Phillips YY, Strohl K. Attributes of ATS documents that guide clinical practice--recommendations of the ATS Clinical Practice Committee. Am J Resp Crit Care Med (accepted for publication)

56. Phillips YY and Hnatiuk OW. Diagnosing and monitoring the clinical course of COPD. Resp Care Clinics NA. (Invited paper submitted)

57. Phillips YY, Kristo D, Kallish M. Writing the take-home prescription for oxygen for hospitalized COPD patients. J of Critical Illness 1998 13:112-22.

58. Moores LK, Rayburn DB, Phillips YY and Fitzpatrick TM. Utilization of capnography as a non-volitional means of estimating airway obstruction. (submitted)

59. Shorr AF, Niven AS, Howard RS, Phillips YY. The American College of Physicians resident abstract competition: success of U.S. military trainees. (submitted)

#### **BOOK CHAPTERS**

1. Phillips YY, Dancer A, Richmond DR. Nonauditory effects of repeated exposure to intense impulse noise; in: <u>Applied and Basic Aspects of Noise Induced Hearing Loss</u>. Salvi R, et al, ed. Plenum Publishing, 1986.

2. Phillips YY and Graeber GM. Blast Injuries in <u>Emergency War Surgery</u>. Bowen and Bellamy, eds. United States Government Printing Office, Washington, D.C., 1988.

3. Phillips YY and Ripple GR. Primary Blast Injury. in <u>The Clinical Practice of</u> <u>Emergency Medicine</u>, Ed. Harwood-Nuss, J.B. Lippincott Company 1990, Philadelphia.

4. Phillips YY and Richmond DR. Primary Blast Injury and Basic Research: a Brief History. in <u>Conventional Warfare: Ballistic</u>, <u>Blast and Burn Injuries</u> (<u>Textbook of Military</u> <u>Medicine</u>, <u>Part I, Vol 5</u>), Office of the Surgeon General, Department of the Army, 1991, US Government Printing Office, Washington, DC.

5. Stuhmiller JH, Phillips YY and Richmond DR. The Physics and Mechanisms of Primary Blast Injury. in <u>Conventional Warfare: Ballistic</u>, <u>Blast and Burn Injuries</u> (<u>Textbook of Military Medicine</u>, <u>Part I</u>, <u>Vol 5</u>), Office of the Surgeon General, Department of the Army, 1991, US Government Printing Office, Washington, DC.

6. Sharpnack DD, Johnson AJ and Phillips YY. The Pathophysiology of Primary Blast Injury. in <u>Conventional Warfare: Ballistic</u>, <u>Blast and Burn Injuries</u> (Textbook of Military <u>Medicine</u>, <u>Part I, Vol 5</u>), Office of the Surgeon General, Department of the Army, 1991, US Government Printing Office, Washington, DC.

7. Phillips YY and Zajtchuk JT. The Management of Primary Blast Injury. in <u>Conventional Warfare: Ballistic , Blast and Burn Injuries (Textbook of Military Medicine,</u> <u>Part I, Vol 5)</u>, Office of the Surgeon General, Department of the Army, 1991, US Government Printing Office, Washington, DC.

8. Phillips YY, Torrington KG, Hnatiuk OW. Chronic Obstructive Pulmonary Disease. in <u>Respiratory Care: a Guide to Clinical Practice</u>, 1997, 4th Edition, Burton, Hodgkin, and Ward Eds, J.B. Lippincott, Philadelphia.

9. Ripple GR and Phillips YY. Military Explosions. in <u>Scientific Foundations of Trauma</u>, Edited by Cooper G, Dudley H, Gann D, Little R and Maynard R. Butterworth Heinemann, 1997, Oxford, England.

#### PRESENTATIONS (1993-97)

Scientific posters presented at International Scientific Assembly (American Thoracic Society) May 1993, San Francisco, CA:

Roach JM, Argyros GJ, Hurwitz KM, Eliasson AH, Phillips YY. "Eucapnic voluntary hyperventilation with dry gas as a bronchoprovocation technique in asthmatics: comparison with methacholine"

Hurwitz KM, Roach J, Phillips YY, Argyros G, Eliasson AH. "Analysis of refractory period after sequential testing with eucapnic voluntary hyperventilation and methacholine inhalation challenge"

Parker JM, Dillard TA, Phillips YY. "Impact of using stated versus measured height on screening spirometry"

Eliasson AE, Poropatich RK, Howard RS, Phillips YY. PFT "Parameters in bronchoprovocation tests"

Scientific posters presented at the 59<u>th</u> International Scientific Assembly of the American College of Chest Physicians, Orlando, FL, October 1993:

Kumke KM, Derderian SS, Hamm CK, Phillips YY, Rajagopal KR. "The effect of Buspirone on sleep in stable asthmatics with severe air flow obstruction"

Weidner SF, Dillard TA, Barg BW, Mehm WJ, Phillips YY, et al. "Effect of upright and supine posture on hypoxemia during air transport"

Slide presentations at 10<u>th</u> Annual Army Scientific/ACP Meeting, Orlando, FL, November 1993:

Parker JM, Dillard TA, Phillips YY. "Impact of stated versus measured height on screening spirometry"

Lepler LS, Argyros G, Phillips YY, Dillard TA, et al. "The utility of capnography and transcutaneous capnometry in the evaluation of airflow obstruction and gas exchange in obstructive lung disease"

Argyros GJ, Phillips YY, Eliasson AE, Roach JM, Hurwitz K. "Eucapnic voluntary hyperventilation as a bronchoprovocation technique: development of a standardized ventilatory dosing schedule in asthmatics"

Kumke KM, Derderian SS, Hamm CK, Phillips YY, Rajagopal KR. "The effect of Buspirone on sleep in stable asthmatics with severe airflow obstruction"

Eliasson AH, Phillips YY, Torrington KG, Howard RS, Taylor YL, Dillard TA. "The Grim Reaper: MD or RN?"

Weidner SF, Dillard TA, Berg BW, Mehm WJ, Phillips YY, Rajagopal KR. "Effect of upright and supine posture on hypoxemia during air transport"

Phillips YY. Exercise-induced asthma and eucapnic voluntary hyperventilation. Pulmonary Grand Rounds, Feb 1994, Brown University, Providence, RI.

Scientific posters presented at the International Scientific Assembly (American Thoracic Society) May 1994, Boston, MA:

Eliasson AH, Phillips YY, Torrington KG, Howard RS, Taylor YL, Dillard TA. "The Grim Reaper: MD or RN?"

Glass KL, Dillard TA, Phillips YY, Torrington KG. "Pulse oximetry correction for smoking exposure"

Kumke KM, Derderian SS, Hamm CK, Phillips YY, Rajagopal KR. "The effect of Buspirone on sleep in stable asthmatics with severe airflow obstruction"

Rayburn DB, Fitzpatrick TM, Lepler LS, Truwit JD and Phillips YY. "Neural network analysis of sequential volume segments from expiratory CO2 curves in the computation of FEV1/FVC ratio and predicted FEV1"

Berg BW, Dillard TA, Phillips YY, Weidner SF and Rajagopal KR. "Hypoxia inhalation testing (HIT): application in COPD"

Dillard TA, Moores LK, Bilello KL and Phillips YY. "The pre-flight evaluation: a comparison of the hypoxic inhalation test with hypobaric exposure"

Derderian SS, Dillard TA, Mehm WJ, Phillips YY and Rajagopal KR. "Hemodynamic effects of altitude exposure to subjects with lung disease"

Argyros GJ, Roach JM, Hurwitz KM, Eliasson AH and Phillips YY. "The refractory period after eucapnic voluntary hyperventilation challenge and it's effect on challenge technique"

Belman MJ and Phillips YY, Co-Chairs. "Healthcare reform and clinical guidelines: pulmonary medicine in the year 2000". Symposium at International Scientific Assembly (American Thoracic Society) May 1994, Boston, MA. Phillips YY. "Clinical practice guidelines in the ATS". Podium presentation in Symposium on Healthcare reform and clinical guidelines: pulmonary medicine in the year 2000, at International Scientific Assembly (American Thoracic Society) May 1994, Boston, MA.

Phillips YY. "Staging of COPD". Podium presentation in Symposium on Proposed clinical practice guidelines and standards of care for the patient with COPD, at International Scientific Assembly (American Thoracic Society) May 1994, Boston, MA.

Howe JD, Green DL, Phillips YY. The use of a single patient trial to determine the effectiveness of morphine sulfate or alprazolam in the treatment of dyspnea associated with emphysematous COPD. Tri-Service Pharmacy Conference, San Antonio, TX. 1994.

Phillips YY. "Clinical practice guidelines in respiratory medicine" Invited podium presentation to 23rd Annual Joint Conference of New Jersey Chapters of ATS and ACCP, 10 Mar 95, New Brunswick, NJ.

Scientific posters presented at the International Scientific Assembly (American Thoracic Society) May 1995, Seattle, WA:

Hurwitz KM, Eliasson AH, Argyros GJ, Phillips YY. "Interpretation of eucapnic voluntary hyperventilation in the diagnosis of asthma".

Argyros GJ, Roach JM, Hurwitz KM, Eliasson AH, Phillips YY. Eucapnic voluntary hyperventilation as a bronchoprovocation technique: development of a standardized ventilatory dosing schedule in asthmatics.

Dillard TA, Knutsen SW, Phillips YY, Berg BW, Mehm WJ, Criswell D. Prevention of altitude hypoxemia: comparison of an oxygen conserving device with nasal cannulae.

Parker JM, Dillard TA, Phillips YY. Arm span to height relationships in patients referred for screening spirometry.

Phillips YY. Practice guidelines: What? Why? and How? Meet the Professor Seminar at the International Scientific Assembly (American Thoracic Society) May 1995, Seattle, WA.

Phillips YY. COPD in the managed care environment. NIH Workshop on "Building a national strategy for prevention, management and research in COPD". Bethesda, MD, 30 Aug 95.

Phillips YY. New ATS COPD Guidelines. Grand Rounds, Sibley Hospital, Chevy Chase, MD, 22 Sep 95.

Phillips YY. "Clinical practice guidelines guidelines: issues and realities (new American Thoracic Society COPD Standards)". USUHS Division of Pharmacology Seminar Series, Bethesda, MD, 12 Oct 95.

Poster presentations at the 61st International Scientific Assembly of the American College of Chest Physicians, New York, NY, October 1995:

Lawless NP, Dillard TA, Torrington KG, Phillips YY. Venturi devices for hypoxia inhalation testing.

Moores LK, Phillips YY, Bilello KM, Dillard TA. The effect of chronic oral diltiazem therapy on exercise capacity and response to hypoxic gas inhalation in severe COPD.

Moores LK, Phillips YY, Bilello KM, Dillard TA. The effect of acute and chronic diltiazem administration on pulmonary gas exchange and oxygen delivery in severe COPD.

Phillips YY. Pulmonary Medicine and Operation Desert Storm. Pulmonary Grand Rounds, University of Pittsburgh, 9 April 1996.

Presentations at International Scientific Assembly (American Thoracic Society) May 1996, New Orleans, LA:

Phillips YY and Anderson S, Co-Chairs. "Clinical Bronchoprovocation Testing" Major Clinical Symposium

Phillips YY. Airway reactivity in non-asthmatic lung diseases. Podium presentation

Phillips YY. ATS Statements and Guidelines. Session in Pre-Course

Dillard TA, Knutson SW, Berg BW, Mehm WJ, Phillips YY. Accuracy of formulae for predicting hypoxemia during air travel. Scientific poster

Phillips YY. Primary Blast Injury. Podium presentation at The Role of Advanced Conventional Weapons in Joint Peacekeeping and Ant-terrorism Operations, Defense Group Inc, Easton, MD, 29 Oct 1996.

Phillips YY. Blast Injuries. Podium presentation at 11th Conference on Military Medicine: Military Medicine in Complex Emergencies, Bethesda, MD, 14 March 1997.

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Niven AS, Poropatich RK, Phillips YY, Parker JM, Torrington KG. High dose triamcinolone acetonide (TA) as induction therapy for pulmonary sarcoidosis.

Moores LK, Rayburn DB, Phillips YY and Fitzpatrick TM. Utilization of capnography as a non-volitional means of estimating airway obstruction.

Phillips YY. Blast injury. 1998 International Disaster Management Conference, February 18-19, 1998, Orlando, FL.

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Berg BW, Dillard TA, Phillips YY, Weidner SF and Rajagopal KR. Hypoxia inhalation testing (HIT): application in COPD. Am J Resp and Crit Care Med 1994; 149:A1007.

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Argyros GJ, Roach JM, Hurwitz KM, Eliasson AH, Phillips YY. Eucapnic voluntary hyperventilation as a bronchoprovocation technique: development of a standardized ventilatory dosing schedule in asthmatics. Am J Resp and Crit Care Med 1995; 151:A402.

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Lawless NP, Dillard TA, Torrington KG, Phillips YY. Venturi devices for hypoxia inhalation testing. Chest 1995 108(3):140S.

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### OFFICIAL RECORD COPY ML 10

125704

This is to acknow edge the receipt of your letter/application dated

5-12-96, and to inform you that the initial processing which includes an administrative review has been performed.

08-01738-02

There were no administrative omissions. Your application was assigned to a technical reviewer. Please note that the technical review may identify additional omissions or require additional information.

Please provide to this office within 30 days of your receipt of this card

A copy of your action has been forwarded to our License Fee & Accounts Receivable Branch, who will contact you separately if there is a fee issue involved.

Your action has been assigned Mail Control Number 12570.4When calling to inquire about this action, please refer to this control number. You may call us on (610) 337-5398, or 337-5260.

NAC FORM 532 (RI) (6-96) Sincerely, Licensing Assistance Team Leader



#### POST-GRADUATE EDUCATION:

1976-77 Internal Medicine Internship, Tripler Army Med Center, Honolulu, HI

1977-79 Internal Medicine Residency, Tripler Army Medical Center

1980-83 Pulmonary Medicine Fellowship, Walter Reed Army Medical Center Washington, D.C.

546

NRC FORM 8C (7-94) NRCMD 3.57

#### COVER SHEET FOR CORRESPONDENCE

#### USE THIS COVER SHEET TO PROTECT ORIGINALS OF MULTI-PAGE CORRESPONDENCE

DEPARTMENT OF THE ARMY WALTER REED ARMY MEDICAL CENTER WASHINGTON, D.C. 20012

REPLY TO ATTENTION OF:

HSWP-QHP

SUBJECT: Misadministration Report, Third Quarter 1981

US Nuclear Regulatory Commission Region I Office of Inspection and Enforcement 631 Park Avenue King of Prussia, PA 19406

1. Pursuant to Title 10, Chapter 1, Code of Federal Regulations, Part 35, Section 35.43, the following information is provided to comply with the Nuclear Regulatory Commission's regulation on the reporting of diagnostic misadministration of a radiopharmaceutical.

2. On 29 July 1981 at 1000 hours, a patient was scheduled for a MUGA scan (gated heart study). At approximately 1000 hours, the patient was premedicated as per standard procedure with 15.2 mg of Stannous Pyrophosphate in 2 ml Sodium Chloride 0.9%. At 1035 hours,/ SSN/ \_\_\_\_\_\_, injected in \_\_\_\_\_\_\_ error 20 mCi of Technetium Methylene Diphosphonate (Tc99m MDP), a bone scanning agent intended for another patient, intravenously into the patient instead of the prescribed dose of 25 mCi of Sodium Pertechnetate NaTc99m04.

3. The dose intended for the patient was properly numbered and labeled as per standard procedures. The dose of bone scanning agent (TcMDP) was properly numbered and labeled for the proper patient.

4. The misadministration was the result of failure on the Nuclear Medicine technologist, \_\_\_\_\_\_\_\_ to follow procedures to identify the proper dose for the proper patient.

5. The patient was informed by Dr. Douglas Eggli, MAJ, MC, Nuclear Medicine fellow, of the dose misadministration and was rescheduled for a repeat MUGA scan. The implications of the misadministration, including a renal and bladder dose of 0.1 to 0.5 RADs was explained to the patient. The patient was informed that there were no ill-effects to be expected and that there was no known tumor induction risk associated with a dose in this diagnostic range.

6. The patient's referring physician, Dr. John W. Shuck, CPT, MC, was notified in writing and a record of the misadministration was placed in the patient's chart by Dr. Douglas Eggli, MAJ, MC, Nuclear Medicine Service, WRAMC.

> Information in this record was deleted in accordance with the Freedom of Information Act, exemptions.\_\_\_\_\_\_\_ FOIA-\_\_\_\_\_\_

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MLER-R1-81-147

90CT 1981

Docket No 30-0131

02-01738-02

## 90CT 1981

HSWP-QHP

#### SUBJECT: Misadministration Report, Third Quarter 1981

7. Following this incident, a thorough review of the Nuclear Medicine Service's handling of radiopharmaceutical doses was done by the senior nuclear pharmacist, LTC Richard E. Stotler, MSC. All doses were properly numbered, color coded, and labeled with the patient's name, SSN, study to be done and the radiopharmaceutical and exact dose on the syringe. No administrative or labeling errors were present in this case or found in a review of other doses prepared for use in this clinic.

8. The error was entirely a failure to recognize, check, and administer a properly labeled dose to the proper patient.

9. The technologist responsible was counselled on the proper procedures to follow in administering doses and a special class was presented to the entire technologist staff on the proper procedures and their responsibility in insuring the dose intended for a patient is for that patient, the proper radiopharmaceutical and in the correct dosage range for the study to be done.

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FOR THE COMMANDER:

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LTC, MSC Adjutant General

CF: TSG HQDA (DASG-PSP-E) Washington, DC 20310

|                    | 111LEK-K1-51-14/                                                          |
|--------------------|---------------------------------------------------------------------------|
| هه<br>۲ - ۲<br>۱۹۹ | Docket No 30-01317                                                        |
|                    | REGION I                                                                  |
| -                  | MATERIALS RADIOLOGICAL PROTECTION SECTION<br>NON ROUTINE EVENT REPORT     |
| I.                 | Action Control Data Oct 9,1921                                            |
|                    | Report Date: Department The WEvent Date:                                  |
|                    | Licensee: 08-01738-62 1 Dept J army (Walter Reed)                         |
|                    | License No: Docket No: 30-01317 Cat/Pri: G                                |
|                    | Event Description: Diagnostic Misadministration of A Radiopharmaceutical  |
|                    |                                                                           |
|                    |                                                                           |
| II.                | Reporting Requirement                                                     |
|                    | 10 CFR 20.402 - theft or loss 10 CFR 20.403(a) overexposure/              |
|                    | 10 CFR 20.403(b) over- 10 CFR 20.405 - 30 day                             |
|                    | Exposure/release 24 nr.<br>License Condition $X$ other <u>10CFR 35,43</u> |
| III.               | Region I Preliminary Response                                             |
|                    | Immediate Site Inspection                                                 |
| •                  | A. Inspector Assigned:                                                    |
|                    | B. Date of Inspection:                                                    |
| •• :               | Special Inspection                                                        |
|                    | A. Date Scheduled:                                                        |
|                    | Inquiry                                                                   |
| ÷ .                | À. Date: Inspector:                                                       |
|                    | B. Licensee Representative & Title:                                       |
| ·                  |                                                                           |
|                    |                                                                           |

REGION I Form 160 Jan. 1979

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|----------------------------------------------------------|---------------------------------------|
|                                                          |                                       |
| IV. Evaluation of Report                                 |                                       |
| X Description of Event                                   | • • • •                               |
| E Levels of R/M Involved                                 |                                       |
| . X Cause of Event                                       | •                                     |
| K Corrective Action                                      |                                       |
| X Calculations Adequate                                  |                                       |
| V. <u>Action Required</u>                                |                                       |
| PN                                                       |                                       |
| Daily Report                                             |                                       |
| IE:FFMSI Notified, Individual Making Notifi              | ication:                              |
| Phone Call to Licensee                                   | •                                     |
| Special Inspection                                       |                                       |
|                                                          | erence in Inspection Ltr)-            |
| None                                                     |                                       |
| VI. Followup Actions                                     | · · · · · · · · · · · · · · · · · · · |
| <u>X.</u> Enter Information in IE:I Form 39 & Region     | I Logbook                             |
| $\mathbf{X}$ Review at next routine inspection - memo to | o file                                |
| VII. Special Instructions                                |                                       |
| A                                                        |                                       |
| Completed By: [                                          | Date: 1/5/87                          |
| Reviewed By:                                             | Date:                                 |
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DEPARTMENT OF THE ARMY WALTER REED ARMY MEDICAL CENTER WASHINGTON, D.C. 20012

REPLY TO ATTENTION OF: 050CT (983

121-4. 5-157

30-01317

HSHL-HP

SUBJECT: Misadministration Report, Third Quarter 1983

US Nuclear Regulatory Commission Region I Office of Inspection and Enforcement 631 Park Avenue King of Prussia, PA 19406

1. Pursuant to Title 10, Chapter 1, Code of Federal Regulations, Part 35, Section 35.43, the following information is provided to comply with the Nuclear Regulatory Commission's regulation on the reporting of diagnostic misadministration of a radiopharmaceutical.

2. On 15 Sep 83 at 1038 hours, Patient "X" received an injection of Tc99m heat damaged red blood cells intended for another patient. Both patients were scheduled for heat damaged red blood cell spleen scintigraphy.

3. The radiopharmaceutical was prepared following standard pharmacy procedures. The radiopharmaceutical was correctly identified and all supporting documentation accompanied the radiopharmaceutical to the dose lab, per standard procedure.

4. The dose misadministration occurred as a result of the failure of the technologist (SP5 SSN who dosed the patient, to follow standard procedure for verification of the correct radiopharmaceutical/patient combination prior to dose administration.

5 Once the misadministration was identified, the patient was immediately informed by Dr. Douglas Eggli, MAJ, MC, Nuclear Medicine staff physician, of the misadministration and was monitored for signs and symptoms of a transfusion reaction. The patient experienced no immediate adverse effect. A formal transfusion reaction workup was initiated through the blood bank. The patient was also observed in the clinic for two hours after the misadministration with no adverse reaction noted during this time. An initial note describing the misadministration was placed in the patient's medical record and her attending surgeon at DeWitt Army Hospital (Dr. Goldman) was notified by telephone. The patient was returned to DeWitt Army Hospital where she was an inpatient and was observed there for an additional 24 hours.

6. Patient "X" was informed of the possible immediate and long range health consequences of the dose misadministration, in this case primarily related to a possible transfusion reaction, Rh sensitization, and the risk of transmission of disease via unscreened blood products, principally hepatitis.

Information in this record was deleted in accordance with the Freedom of Information Act, exemptions

MM12

HSHL-HP

#### SUBJECT: Misadministration Report, Third Quarter 1983

7. The patient whose tagged red cells were administered to Patient "X" was also informed of the misadministration. The patient agreed to allow her blood to be drawn and submitted to the blood bank as part of the transfusion reaction evaluation.

8. The transfusion reaction evaluation revealed that both patients were O-negative blood type. There was no evidence of a hemolytic reaction. Direct Coombs test, plasma hemolysis, and urine hemoglobin were all negative. The "donor" serum is HG Ag negative, however, there was a mildly elevated serum SGPT. The Infectious Disease Service recommended that the patient receive prophylaxis with immune globulin based on the elevated SGPT. This recommendation was referred on to Patient "X's" primary care physician (the surgery ward resident, Dr. Feiner) at DeWitt Army Hospital by telephone as soon as the result became available (approximately 1600 hours on 16 Sep 83).

9. A formal written report of the misadministration along with the original copy of the blood bank's transfusion reaction evaluation have been forwarded to Dr. Goldman at DeWitt Army Hospital.

10. The technologist who misadministered the dose was counselled individually as to the the serious nature of the misadministration and potential health risks to the patient.

11. The need for strict adherence to standard patient identification and dosing policy were reviewed with the entire technical staff. The potential adverse health consequences for patients of such dose misadministrations were reviewed in detail.

12. Although adherence to standard procedure for patient and radiopharmaceutical identification would have prevented this misadministration, the procedure for administration of in vitro labeled homologous blood components is being changed to require that two people verify the correct patient/dose combination prior to dose administration.

FOR THE COMMANDER:

MAJ(P) MSC

Adjutant General

2

CF:

TSG, HQDA (DASG-PSP-E), WASH DC 20310

RADIOLOGICAL FROTECTION SECTION Que. # C8-0/738-0 LICENSEE EVENT REPORT Docket No. 30 -01317 MLER \_ RI-83- 1.37 I. Action Control Data Liceosee WALTER PEED ARMY MEDICAL CENTER DEPT. OF THE ARMV Event Description OHGNOS TIC . MS BOMMIS TRATION Report Date , 70-5-83 Event Date 9-15-83 Reporting Reouirement II. 10 CFR 20.402 - theft or loss 10 CFR 35.42 Therapeutic Misadu 10 CFR 20.403 (a) (b) overexposure/ 10 CFR 35.43 Diagnostic Misadmi 11. release 10 CFR 20.405 - 30 day report License Condition Other Region I Response III. Date Immediate Site Inspection Inspector Inspector Date Special Inspection Inspector Date Telephone Inquiry Licensee Representative and Title ₽N Daily Report Information entered - Region I log and Outstanding Items List. Review at next routine inspection Report Evaluation IV. 5 C Corrective Actions Description of Event Level's of R/M involved alculation adequate -Cause of Event Letter to Licensee requesting add · Information Completed by P. H. Jahne Date 10/25/83 Date ' Reviewed by Special Instructions or Comments:

AHUN MULLIN Docket No. UDUUISII -0 MLER-HSHL-H-HP (SGFS-PSP/2 Jan 91) (385-11k) 1st End LTC Myers/A291 SUBJECT: Dosimeter Exposure: SSAN: \$6 Commander, Walter Reed Army Medical Center, ATTN: HSHL-H-HP, Washington, DC 20307-5001 1 8 JAN 1991 MEMORANDUM THRU Commander, US Army Health Services Command, ATTN: HSCL-P, Fort Sam Houston, TX 78234-6000 FOR Headquarters, Department of the Army, Office of The Surgeon General, ATTN: SGPS-PSP, 5109 Leesburg Pike, Falls Church, VA 22041-3258 Information in this record was deleted in accordance with the Freedom of Information Reference: Act exemptions 6 1. Telephone conversation between Mr. Burton, WRAMC Health Physics a. Office, and Ms. Nessen, NRC Region I, 21 Dec 90, subject as above. Telephone conversation between Mr. Burton, WRAMC Health Physics ь. Office, and Ms. Nessen, NRC Region I, 11 Jan 91, subject as above. activities. ctivities, personal jand his peers, it has been Following a review of .2. status, and interviews with concluded that he did not receive the exposure recorded by his Nov 90 dosimeter. An administrative dose of 9 mRem has been assigned to )Nov 90 dosimetry record, which is equivalent to the average of his last twelve months exposure histories. 3. Consider: was notified in Oct 90 that his appeal to the a. Qualitative Management Program-action against him had been denied and that he would be involuntarily released from active duty on 31 Dec 90. discussed with SFC Green, NCOIC Health Physics Office, b. WRAMC, the characteristic of TLDs being unable to provide information which would allow the identification of deliberate exposures. . mentioned to SSG Simmons, NCOIC Radicactive Materials Control Branch, HPO, WRAMC, that he was "going to do something" before he was separated from active duty. stated that he found his Nov 90 dosimeter at the end d. , of the wearing period after having placed it on a shelf in WRAMC's radioactive waste processing center at the beginning of the wearing period. (1) The shelf was located near "needle boxes" from WRAMC's Nuclear Medicine Clinic which contained short half-life, relativelyhigh-activity residues from typical Nuclear Medicine procedures. The boxes were being held there to allow for the isotopes to decay to a

> RETURN OF DETINAL TO DERIVARY ACT

· HEGION X

HSHL-H-HP SUBJECT: Dosimeter Exposure:

point where the boxes could be declared of no radiological interest and disposed of as non-radioactive waste.

MATION PRU

SSAN:

(2) It is estimated that several tens of milliCuries of isotopes typically used by Nuclear Medicine Clinics (e.g.,  $^{99}$ Tc and  $^{131}$ I) may have been present in the waste holding area during Nov 90. This amount of activity could have resulted in an exposure of the magnitude recorded by ( )TLD (over a three to four week period).

e. \_\_\_\_\_ further stated that during the period that his dosimeter was on the shelf, he was wearing someone else's dosimeter, but he wouldn't say whose dosimeter he was wearing.

(1) The only non-routine activity in which was involved during Nov 90 was the survey of several fluoroscopy systems.

performance of the surveys and neither / nor( received any recordable exposures during Nov 90.

4. We have concluded that it is likely that / deliberately placed his dosimeter in proximity to the Nuclear Medicine needle boxes being held for decay in WRAMC's radioactive waste processing center and that he did not receive the exposure recorded by his Nov 90 dosimeter.

5. The NRC Region I Office was notified of the exposure recorded by ) dosimeter (reference 1a). When advised that our investigation concluded that \_\_\_\_\_/did not receive this exposure, they said not to continue with 10CFR20 notification procedures. During reference 1b, a request was made to provide NRC Region I a copy of our final investigation.

separated from active duty on 31 Dec 90.

LIEWELLYN F. PIPER LTC, MS Executive Officer

2. \_WRAMC HPO ALARA Interview

3. Statement

FOR THE COMMANDER:

8 Encls

Added 7 encls

1 nc

4. Record of Telephone Conversation

5. Admin Dose Worksheet

6. 1990 Exposure History

7. 1989 Exposure History

8. 1988 Exposure History

EX 6 portions

CF: US Nuclear Regulatory Commission, Region I, 475 Allendale Road, King of Prussia, PA 19406

CONTAINS INFORMATION PR



DEPARTMENTO FILE ARMY OFFICE OF THE SURGEON GENERAL 5109 LEESBURG PIKE FALLS CHURCH, VA 22041-3258



REPLY TO ATTENTION OF

SGPS-PSP (385-11k)

M≙ئل 2 1091

SSAN:

MEMORANDUM THRU Commander, U.S. Army Health Services Command, ATTN: HSCL-P, Fort Sam Houston, TX 78234-6000

FOR Commander, Walter Reed Army Medical Center, ATTN: HSHL-H-HP, Washington, DC 20307-5001

SUBJECT: Dosimeter Exposure:(

1. The enclosed message indicates that the whole body dosimeter of a member of your command has been exposed to 06.700 rem of shallow dose equivalent and 06.400 rem of deep dose equivalent x-radiation.

2. Investigative procedures to be followed are in AR 40-14.

3. Your report of investigation along with a recommendation for dose to be assigned should arrive in this office by 1 March 1991. Because this is a Type III exposure, to be removed from all duties involving potential exposure to ionizing radiation, and he may not be returned to such duties without the written concurrence of this office (AR 40-14, paragraph 13).

4. Copies of the last 6 - 12 months of radiation exposure history should accompany your report.

FOR THE SURGEON GENERAL:

Encl

a s

Col Me RONALD R. BLANCK

RONALD R. BLANCK Brigadier General, MC Director, Professional Services

Ex 6 portions

UN PRA

DPERATIONS SUPPORT DIRECTORATE.

. ROUTINE

ZYUW RUCLBNA2597 3541425

ACTION DASG(4)

SCB REVIEW(1)

INFO

R 201200Z DEC 90 FM CUSAIRDC LEXINGTON KY //AMXTM-SR-DC/ BY THE PRIVACY ACT INFO DA WASHINGTON DC //DASG-PSP-E/4

UNCLAS

SUBJECT: THERMOLUMINESCENT DOSIMETER EXPOSURE

CDRAMC ALEXANDRIA VA //AMCSE-P//

THIS CONFIRMS THE TELECON BETWEEN LT. CUMMINGS AND NAT BERRY ON 19 DECEMBER 1990.

THERMOLUMINESCENT DOSIMETER (TLD) NUMBER LISTED AS A 2. WHOLE BODY BADGE ISSUED TO( SSN FOR THE WEARING PERIOD 4 NOVEMBER TO 1 DECEMBER 1990, INDICATES EXPOSURE TO X-RAY RADIATION OF 6.700 REM/6700 MREM SHALLOW (7 MG/ SQUARE CM DEPTH) DOSE EQUIVALENT AND 6.400 REM/6400 MREM DEEP (1000 MG/SQUARE CM DEPTH) DOSE EQUIVALENT.

SUGGEST YOU REVIEW 10 CFR 20, 29 CFR 1910, APPLICABLE NUCLEAR 3. REGULATORY COMMISSION LICENSES, AR 40-14, AR 385-40, AND LOCAL PROCEDURES TO INSURE THAT ANY REPORTING REQUIREMENTS (E.G. IMMEDIATE. 24-HOUR, OR 30-DAY NOTIFICATIONS) ARE FULFILLED IN A TIMELY MANNER. ΒT

Ex 6 portions

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CONTAINS INFORMATION PROT

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He<br>-h of November,                                                                                                | j remenu<br>has radio<br>to other<br>claims th                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
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| 5.<br>5.<br>7.                                                                                     | Uni<br>plai<br>ma<br>ha<br>Dos<br>Wea                               | Procedures<br>Procedures<br>The TLD<br>The Such<br>Medical AD<br>Medical AD<br>Medic                                                       | nces:<br>s: While Sortin<br>on a shelf<br>as III TESS<br>ental:<br>s do nut appendent<br>for the budge<br>/stored correct<br>MA<br>ed apron                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | tothed wear som<br>tothed wear som<br>tothe for a pen<br>ar to be reciev<br>the whole ment<br>tly:<br>(yes)(no)<br>yes no                                           | s 576,<br>ne needles which<br>id of 3-4 which<br>red by him. 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Cummi                                                                                                                                                                   | As radio<br>thas radio<br>claims the<br>aute meter<br>propiete p                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
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| 5.<br>7.<br>1<br>3.<br>9.                                                                          | Uni<br>a.<br>place<br>That<br>Dos<br>West                           | Procedures<br>Procedures<br>Medical/D<br>Medical/D<br>Medical/D<br>Exposures<br>instry worn<br>aring/Using:<br>Lead<br>Lead<br>Lead<br>(oth<br>D Interviewe<br>rson being i                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 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Cummi<br>Debbic L. Cummi<br>Debbic L. Cummi                                                                                                                             | J BEATERIN<br>HAS radie<br>Claims H<br>we been<br>white multi-<br>propriete p                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
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Cummi<br>Debbic L. Cummi<br>Debbic L. Cummi<br>Debbic L. Cummi                                                                                                          | J REmem.<br>HAS radi                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

CONTAINS INFORMATION PROTECTED BY THE PRIVACY ACT" To whom it May Concern: On or about 6 Wor 90 4 lost my film badge in the needle bop room in Blog 516. I found the badge on 3Dacs and due to where the badge was, it is probably highly exposed to reduction. The bady wind probably exceed all standarda in the regulations. Ex6 CONTAINS INFORMATION PROTECTED BY THE PRIVACY ACT" Frid 3

DATE TELEPHONE OR VERBAL CONVERSATION RECORD 21 Cer 90 For use of this form, see AR 340-15; the proponent agency is The Adjutant General's Office. SUEJECT OF CONVERSATION Foss ble OVEL OXPOSINE TA + A. A. INCOMING CALL PERSON CALLING DORESS HONE NUMBER AND EXTENSION 410 WRAMO Button 427-5268 188 PERSON CALLED 337- 5000 Region OUT GOING CALL In i con an PERSON CALLING PERNAY Nelson OFFICE Keylon T NRC ADDRESS HPO. PERSON CALLED WRAMC 8011 But ton 427-5104 I called NRC to report a film badge teeding of 6 Rem soft dose and 7 Rem pard dose on the I asked the to November badge of ( a formal notification was neacessary if it thad been determined that the experie was not an actual exposure of the individual. Penny Nelson called me back, and when appraised of the situation said if the exposure was not valid no formal notification to NRC was necessary. An investigation must be documented and brought before the RCC. David W Gurtin EX.6 RY THE PRIVACY En1 4 A. FORM 751

REPLACES EDITION OF 1 FEB 53 WHICH WILL BE USED.

| WINAIN HIVAN TUN TRUTEULD |  |
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| - DY THE PRIVACY ANT      |  |
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| EX. | 65 | AVE |
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| •   |    |     |

ERAGE EXPOSURES OVER LAST 12 MONTHS

|                     | 1         |                |                 |
|---------------------|-----------|----------------|-----------------|
|                     |           | hard dose      | ring(soft dose) |
| 12/02/89            | .009      | .009           | .000            |
| 11/05/89 - 12/02/47 | 010       | .010           | .012            |
| 12/03/89 - 01/06/90 | .010      | - 011          | .000            |
| 01/07/90 - 02/03/90 | .011      |                | 000             |
| 02/04/90 - 03/03/90 | .007      | .007           | .000            |
| 03/04/90 - 03/31/90 | .008      | .008           | ,000            |
| 04/01/90 - 05/05/90 | .007      | .007           | .000            |
| 05/06/90 - 06/02/90 | .006      | .006           | .000            |
| 06/03/90 - 06/30/90 | .000      | -000           | .000            |
| 07/01/90 - 08/04/90 | .040      | .027           | .000            |
| 08/05/90 - 09/01/90 | .019      | 300.           | .000            |
| 09/02/90 - 10/06/90 | .014      | .014           | .000            |
| 10/07/90 - 11/04/90 | .042      | .005           | .000            |
| . 173/              | 12 = .014 | .110/12 = .009 | .012/12 = .001  |
|                     |           | 7.000          | 5.300           |
| 11/05/90 - 12/02/90 | 6.000     |                | no data         |
| 12/02/00 - 01/01/91 | no data   | no data        | 110 44114       |

Ex le portion

"CONTAINS INFORMATION PRO BY THE PRIVACY ACT"

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WARHING UN AUMATE ANT !! FOR OFFICIAL USE ONLY PCN V6D0D100 PRIVACY AC ATEC ANNUAL/QUARTERLY HISTORY OF EXPOSURE TO IONIZING RADIATION DATE 12/14/90 PAGE (001 NAME SOC SEC HA DATE OF BINTH OCCUPATION CODE PERMISSIBLE LIFETIME DSGE 135.000 ALL DOSES REPORTED IN REM TATR DUSE THIS YEAR RD SOFT HARD NOTE TUDSE THIS DIR DOSE EN FETTRE BUG DOSE THIS PERIOD FERTOD WORN STA FILM SOFT X-GAMMA NEUTRON SOFT HARD NR NR CD CD HARD FROM τđ TOTAL DF WHOLE BODY HARD DOSE PRIOR TO 1990 000,079 000.0110000.011 000.011-000.011 07707790-02703790 .9C 9498 000,011,000,011, 000,000 000,000,000,000,000 BC 0075 ē 000,000 000,000 000.000 000.000 n1/07/00 02/03/90 000.018 000.018 02/04/90 03/03/90 BC 3862 ε 000,007 000,007 000,018 000,018 000,097 000,000 000,000 000.000 000.000 ÐC 0077 Õ 000.000 000.000 02/04/00 03/03/90 000,000 000,000 000.000 000,000 03/04/00 03/31/90 03/04/00 03/31/90 000.000 000.000 EIC. 0075 Ģ ВĈ 0520 Ē 000,000,000,000 000,028 000,026 000.026-000.026 000,105 BC 0086 G 000.000 000.000 04/01/90 05/05/90 000,000 000,000 000.000 000.000 04/01/00 05/05/90 BC 7598 Ε 000.007 000.007 000.007 000.007 000,033 000.033 000.112 0096 G 000,000 000,000 000,000,000,000 05/06/90 06/02/90 BC 000.000 000.000 25705700 06702790 ÊGE 000.006-000-006 000.039-000.039 BC 8048 UON.TT18 06/03/90 06/30/90 BC 0096 000.000 000.000 000.000 000.000 000,000 000,000 16/03/80 06/30/90 BC 4876 000.000 000.000 000.013 000.013 000.039 000.039 080.118 07/01/00 08/04/90 BC 0086 G 000.000 000.000 000.079 000.000 000,000 000,000 17701790-09704790 ЪČ 5014 E E G 000.040 000.027 000.040 000.027 000. 145 18/05/90 09/01/90 BC 3753 000.019 000.006 000.098 000.072 000.059 000.033 000,151 18/05/90 09/01/90 BC 0093 000.000 000.000 000,000 000,000 000.000 000.000 000.014 000.014 19/02/90 10/06/90 BC 1172 Ē 000.073 000.047 000.112 000.066 000,165 0076 BC 000.000 000.000 9/02/00 10/06/90 G 000.000 000.000 000.000 000.000 HIS REPORT IS FURNISHED TO YOU UNDER THE PROVISIONS OF THE U.S. NUCLEAR REGULATORY COMMISSION REGULATIONS (10 CFR 19) R THE DEPARTMENT OF LABOR REGULATIONS (29 CFR 1910). YOU SHOULD PRESERVE THIS REPORT FOR FUTURE REFERENCE. BC COMMANDER WALTER REED ARMY MEDIDAL CENTER BLDG. 188 FOREST GLEN SECTION. ATTN HEALTH PHYSICS SECTION WASHINGTON, DC 20012-5001 E 000.042 000.005 G 100.000 000.0000 Ē .006.000 007.000 conversion trim. beington. (R. N. desich 065.300 Verbul OCLECCO Mr. Ardiens Bindy reported Lannings 1030 hrs 14 Terial  $t_D$ INFORMATH

TRALING DDIVACV 7115 CH VEUNDIODUAA FOR OF DETAL USE ONLY PRIVACY ACT DATA ANNUAL/QUARTERLY HISTORY OF EXPOSURE TO IONIZING RADIATION PAGE 001 DATE 03/27/90. IANE JOC SEC NR UCCUPATION CODE PERMISSIBLE LIFETIME DSGE 135.000 DUSE THIS OTR DUSE REPORTED IN REM DOSE THIS PERIDD DUSE LIFETIME FERIOD WORN STA FICM BDG. NOTE FRON TO NR NR CD CD. SOFT X-GAMMA NEUTRON SOFT HARD SOFT HARD HARD TOTAL OF WHOLE BODY HARD DOSE PRIOR TO 1989 000,007 000.000-000.000 01701709 02704789 3620 000,000,000,000 DC <u>000,000,000,000</u> 0007007 ē. 01/01/89 02/04/89 BC 0134 000,000 000,000 000.000 000.000 000.000 000.000 вč È 12/05/89 03/04/89 2979 000.000 000.000 000.000 000.000 000.000 000.000 000.007 ÐĊ ē 12/05/89 03/04/89 0076 000,000 000.000 000.000 000.000 000.000 000.000 000,000 000,000 BC 000,000,000,000 13/05/89 04/01/89 0080 Θ 000,000\_000,000 13/05/89 04/01/89 1541 E <u>"000"000"000"000</u> 000.007 04/02/89 05/06/89 ÐC 0079 Θ. 000.000 000.D00 000,000 000,000 000.000 000.000 04/02/09 05/06/09 BC 4905 E 000.011 000.011 000,011 000,011 000.011 000.011 000.018 05/07/89 06/03/89 BC 0073 Ø 000,000 000,000 000.000 000.000 000,000 000,000 15707789 06703789 BC 1393 E 000,000,000,000 000.011-000.011 110,000,011,000,000 000.019 16/04/89 07/01/89 BC 0048 Ö E 000,000 000,000 000.000 000.000 000.000 000.000 06/04/89 07/01/80 BC 9970 000,023 000,005 000.034 000.016 000.034 000.016 000.023 000,012-000,012 000,002,000,000 17/02/89 08/05/89 BC 0076 000,000 000,000 17702789 08705789 BC 2534 E 000.046-000.029 000.032 000.000 000 000 BC 0073 ē 18/06/89 09/03/89 000.000 000.000 000.000 000.000 BC 18/06/89 09/02/89 9207 000.011 000.011 000.023 000.023 000,057 000,039 000.046 19/03/89 09/30/89 **BC** 000,000,000,000 000,000 000,000 0067 G 000,000 000,000 19/03/89 09/30/89 вс 1448 Ε 000,014 000,014 000,037 000.037 000.071 000.053 000,060 BC 0067 Θ. 000,000 000,000 10/01/89 11/04/89 000.000 000.000 000.000 000.000 11/05/89 12/02/89 BC 0074 Θ 000.000 000.000 000.000 000.000 000.000 000.000 11/05/89 12/02/89 BC 3438 Ε 000.009 000.009 000.009 000.009 000.080 000.062 000.069 BC 0078 ē 000,012 000.000 12/03/89 01/06/98 000,012 000.000 000,012 000,000 12703/89 01706790 ĐĈ 6346 000,018.000,018. 000,090,000,072 F 000.028 THIS REPORT IS FURNISHED TO YOU UNDER THE PROVISIONS OF THE U.S. NUCLEAR REGULATORY COMMISSION REGULATIONS (10 CFR 19) IN THE DEPARTMENT OF LABOR REGULATIONS (29 CFR 1910). YOU SHOULD PRESERVE THIS REPORT FOR FUTURE REFERENCE. BC COMMANDER WALTER REED ARMY MEDICAL CENTER BLDG. 188 FOREST GLFN SECTION OUARTERLY REVIEW ATTN HEALTH PHYSICS SECTION WASHINGTON, DC 20012-5001 BY R.P.O. 10/01/89 W 11 1 1 11/04/89 BC C 000.006

| PORT THE PRIVACY ACT"                                                                                                                                                                             | FOR OFFICIAL USE ONLY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                             | · · · · · · · · · · · · · · · · · · · |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|---------------------------------------|
| DATE 03/29/80                                                                                                                                                                                     | UAL/OUARTERLY HISTORY OF EXPOSURE TO TONIZING RADIATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | PAGE 001                                                                                    | )<br>ب<br>ب                           |
| RAMI<br>SOC MEL NR<br>PATE OF STREE                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                             |                                       |
| DERIVISIAL LIFETIME DADE 100.0                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | DACES DEDASTED IN ST                                                                        | - 14                                  |
| FR 1 1) NR NR                                                                                                                                                                                     | DOG NOTE DOSE THIS PERTOD DOSE THIS OFF<br>CD CD SOFT X-DANMA NEUTRON SOFT HARD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | DUSE THIS YEAR<br>SOFT HARD                                                                 | DOSE LIFET<br>HARD                    |
| FOTAL OF HED. SOUT HUDD COSE PR                                                                                                                                                                   | 10R TO 1989                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | -                                                                                           | 000,000                               |
| 171 APR 68 02/00 6 10/20 0098<br>62/07728 03/05 1 014 0098<br>63/077286 04/07 060 0098                                                                                                            | A 000,000 000,000 000,000 000,000 000,000 000,000 000,000 000,000 000,000 000,000 000,000 000,000 000,000 000,000 000,000 000,000 000,000 000,000 000,000 000,000 000,000 000,000 000,000 000,000 000,000 000,000 000,000 000,000 000,000 000,000 000,000 000,000 000,000 000,000 000,000 000,000 000,000 000,000 000,000 000,000 000,000 000,000 000,000 000,000 000,000 000,000 000,000 000,000 000,000 000,000 000,000 000,000 000,000 000,000 000,000 000,000 000,000 000,000 000,000 000,000 000,000 000,000 000,000 000,000 000,000 000,000 000,000 000,000 000,000 000,000 000,000 000,000 000,000 000,000 000,000 00,000 00,000 00,000 00,00 00,00 0,00        | 000,000 000 000 000<br>000,000 000,000<br>000,000 000,000                                   | 000,000<br>000,000<br>000,000         |
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|                                                                                                                                                                                                   | UNDER THE PROVISIONS OF THE US NUCLEAR REGULATORY COMMIS<br>AT (012 (29 CFP 1910) TO YOU SHOULD ARESERVE THIS REPORT FO<br>EC COMMANDER<br>WALTEN DEED ARMY MEDICAL CENTER<br>ELDG, 130 FOREST GLEN SECTION<br>AT (N HEALTH PHYSIDS SECTION<br>WASHINGTON, DC 20012-5001                                                                                                                                                                                                                                                                                                                                                                                               | SSION REGULATIONS (10<br>R FUTURE REFERENCE)                                                |                                       |
|                                                                                                                                                                                                   | JML COMMANDER<br>US ARMY MEDICAL RESEARCH INSTITUTE<br>OF INFECTIONS DISEASES<br>FI DETRICK<br>FREDERICK, MD 21701-5011                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                             |                                       |
|                                                                                                                                                                                                   | DIMMERLY R                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | ENIL M LA BHU IVA                                                                           | 11-14 Jone<br>1389                    |
|                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                             | -<br>                                 |
|                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                             |                                       |
|                                                                                                                                                                                                   | BY THE PRIVACY ACT"                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                             |                                       |

REGION I MMSS LICENSEE EVENT REP. 7

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| ^ <b>.</b> . | MMSS LICEN                                     | SEE EVENT REP. 1                                           |
|--------------|------------------------------------------------|------------------------------------------------------------|
|              |                                                | License No. 08-01738-02                                    |
|              |                                                | Docket No. 03001317                                        |
| Ι.           | ACTION CONTROL DATA                            | MLER-RI-91 -01                                             |
| ••           | Licensee DEDT. of the                          | Army                                                       |
|              | Event Description OV erex DOS                  | ed TLD/Dose not received                                   |
|              | Event Date 11/90                               | Report Date 1/18/9/                                        |
| 11.          | REPORTING REQUIREMENT                          |                                                            |
|              | [] 10 CFR 20.402 - theft or loss               | [] 10 CFR 35.33 Therapeutic Misadministration              |
|              | [] 10 CFR 20.403(a)(b)<br>overexposure/release | [ ] 10 CFR 35.33 Diagnostic Misadministration              |
| •            | [] 10 CFR 20.405 - 30 day report               | [ ]-License Condition                                      |
| · .          | M Other hone                                   |                                                            |
| <b>III.</b>  | REGION I RESPONSE                              |                                                            |
|              | [] Immediate Site Inspection                   | InspectorDate                                              |
|              | [] Special Inspection                          | InspectorDate                                              |
| · · · ·      | [] Telephone Inquiry                           | InspectorDate                                              |
| ж.,          | Licensee Representative and Title              |                                                            |
| • .          | [] PN [] Daily Report                          |                                                            |
| •            | [ ] Information entered - Region I log         | and Outstanding Items List                                 |
| •            | [ Review at next routine inspection            |                                                            |
| · IV.        | REPORT EVALUATION                              |                                                            |
|              | [ ] Description of Event                       | [] Corrective Actions                                      |
|              | [ ] Levels of R/M involved                     | [ ] Calculation Adequate                                   |
|              | Cause of Event                                 | [] Letter to Licensee requesting<br>additional information |
|              | Completed by: <u>SAMunnuk</u>                  | Date 3/22/9/                                               |
| •            | Reviewed by:                                   | Date 3/20/91                                               |
| ۷.           | SPECIAL INSTRUCTIONS OR COMMENTS               | in the expassive                                           |
|              | employee did not rec<br>recorded by his No     | v 90 dosimeter                                             |

# CURRICULUM VITAE March 1998

NAME: Yanıy Y Philips. III

60F9A

SSAN: RANK:

Colonel, Medical Corps

MOS: DOB:

**POB:** 

SPOUSE:

CHILDREN:

HOME ADDRESS

WORK ADDRESS: Department of Medicine Walter Reed Army Medical Center

Waiter Reed Army Medical Center Washington, DC 20307-5001 202-782-6205/2348 FAX 202-782-6507 E-Mail: COL\_YANCY\_PHILLIPS@WRAMC1-AMEDD.ARMY.MIL

**EDUCATION:** 

BS Chemical Engineering (High Honors), University of Delaware

Master of Medical Science, CMDNJ-Rutgers Medical School

Doctor of Medicine (Cum Laude), University of Alabama School of Medicine

POST-GRADUATE EDUCATION: 1976-77 Internal Medicine Internship, Tripler Army Med Center, Honolulu, HI

1977-79 Internal Medicine Residency, Tripler Army Medical Center

1980-83 Putmonary Medicine Fellowship, Walter Reed Army Medical Center Washington, D.C. ion in this record was deleted into the Emoder of Information

Information in this record was deleted in accordance with the Freedom of Information Act, exemptions 2000-033



DEPARTMENT OF THE ARMY WALTER REED ARMY MEDICAL CENTER WASHINGTON, DC 20307-5001



REPLY TO ATTENTION OF:

HSHL-HP (385-11m)

21 January 1993

MEMORANDUM THRU Commander, HQ, U,S. Army <u>Health Services Command</u>, 29 JAN 93 <u>ATTN: HSCL-P, Fort Sam Houston, TX</u> 78234-6000

FOR Office of The Surgeon General, ATTN: DASG-PSP, Skyline Plaza 5, 5111 Leesburg Pike, Falls Church, VA 22041-3258 5709

SUBJECT: NRC License Renewal

1. The enclosed NRC License renewal for Walter Reed Army Medical Center is provided IAW TB Med 525.

2. POC for this office is Mr. David Burton who can be reached at (301) 427-5107/5104 or AUTOVON 291-5107/5104.

ENCL

ARTHUR G. SAMPLJAN LTC, MS Chief, Health Physics Office

Information in this record was deleted in accordance with the Freedom of Information Act, exemptions 2+4FOLA -200e - 0338

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| ng, regime 313<br>(-84)<br>D CPN 38, 32, 33, 34,<br>8 and 40                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           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| US NUCLEAR REQULATORY COMMISSION<br>DIVISION OF FUEL CYCLE AND MATERIAL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                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| - MARMINGTON, DC 30648<br>LL GTHER PERSONS FILE APPLICATIONS AS<br>OCATES IN:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          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| U.S. NUCLEAR REGULATORY COMMISSION<br>NUCLEAR MATERIAL SECTION 8<br>631 PARK AVENUE<br>SING OF PROJEMA, PA 19406                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       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| LABAMA, PLOBIGA, GEORGIA, KENTUCH V.<br>MERTO BICO, BOUTH CAROLINA, TEMPERSE<br>NET VIGGINA, SEND APPLICATIONS TO:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | HERENY, NORTH CAROLINA<br>, VINGINIA, VINGIN HLANDE, OR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | ARLINGTON, TX 30011<br>ALASKA, ARIZONA, BALIPORNA, MANIALI, NEVADA, GREBON, WASHINGTON,<br>AMD U.B. TERRITURIOS AND POSISSIONS IN THE PACH IC, DIND APPLICATIONS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |        |
| U S. NUCLEAR REGULATORY COMMENSION<br>MATERIAL RADIATION PROTECTION SECT<br>191 MARIETTA STREET, BUITE 2000<br>ATLANTA, GA 30333                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | . REGION M<br>KON                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | TU:<br>U.S. NUCLEAR REGULATORY COMMISSION, REGION V<br>MATERIAL RADIATION PROTECTION SECTION<br>1400 MARIA LAND, BUTE TIO<br>WALMUT CREEK, CA. SHEE:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |        |
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| THIS IS AN APPLICATION FOR ICHAN AND                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 2. 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| C. 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| ACCPERIERI WHERE LICENSED MATERIAL<br>See Item #3<br>Name of Person to be contacted about                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              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| See Item #3<br>Name of PERSon to be contacted about<br>Arthur G. Samiljan,                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                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| ACCREENEED WHERE LICENEED MATERIAL<br>See Item #3<br>hame of Person to be contracted about<br>Arthur G. Samiljan,<br>smit items & theough 11 on sha 11' Par                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      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                                                                                                                                                                                                                                                                                                                                                                                                                                  | TELEMONE MUNERA<br>MS (301) 427-5161<br>ON TO BE PROVIDED IS DESCRIPTED IN THE LICENSE APPLICATION GUIDE.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            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| ADDRESSIES WHERE LICENSED WATERIAL<br>See Item #3<br>Andre of Person to be contacted abou<br>Arthur G. Samiljan,<br>Admit items & theorem is a the Par<br>Radioactive Material<br>& Sement of Men Material<br>& Sement of Men Material                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | WILL BE USED OF POSSESSED<br>T THIS APPLICATION<br><u>Lieutenant Colonel</u> ,<br>ER THE TYPE AND SCOPE OF HIPORMATH<br>P PYYEEL THM, END 6. MONTHIN STRUCT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | ТЕL ВРИСИЕ В ИЛИВАЯ<br>MS (301) 427-5161<br>оч то ва PROVIDED на DEBCRIDED им THE LICENSE АРУЈСКТИОН GUIDE.<br>а. РИМРОВЕНИ РОЛ ИНИСИ LICENSED MATERIAL ИНЦ. DE LINED.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |        |
| ADDRESSIES WHERE LICENSED NATERIAL<br>See Item #3<br>Andre of PERSON TO BE CONTACTED ABOU<br>Arthur G. Samiljan,<br>Menit items & Theough 11 On St 11" Par<br>Radioactive Material<br>Second on Person State<br>Andre State State State State State State<br>Andre State State State State State<br>Andre State State State State State State State<br>Andre State St                                                                                                                                                             | WILL BE USED OF POSSESSED<br>T THIS APPLICATION<br>Lieutenant Colonel,<br>ER THE TYPE AND SCOPE OF HEFORMATH<br>P PHYSIEL THE, SHO & MEMORIMATH<br>P PHYSIEL THE, SHO & MEMORIMATH<br>P PHYSIEL THE PHOGRAM AND THEIR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | MS (301) 427-5161<br>ON TO BE PROVIDED IS DESCRIDED IN THE LICENSE APPLICATION QUIDE.<br>A PURPOSE OF POR WHICH LICENSED WATERIAL WILL BE LISED.<br>B. TRAINING FOR INDIVIDUALS WORKING IN OR PREQUENTING RESTRICTED ARG                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |        |
| ADDRESSIES WHERE LICENSED NATERIAL<br>See Item #3<br>have of Person to be contacted about<br>Arthur G. Samiljan,<br>denit items & theory of the 11' Par<br>Radioactive Material<br>* Semen of men human, & contacted parts<br>in the out of mension of one time.<br>"Holividual Bi REPONSIBLE For Radiat<br>Training and REPONSIBLE For Radiat<br>Training and Esperitence.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | WILL BE USED ON POSSESSED<br>IT THIS APPLICATION<br>Lieutenant Colonel,<br>IT THE TYPE AND SCOPE OF HUPORIMATH<br>Physics form, and E. Georgian Shows<br>ION SAFETY PROGRAM AND THEIR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | TELEMONE MINESA<br>MS (301) 427-5161<br>ON TO SE PROVIDED & DESCRIGED IN THE LICENSE APOLICATION GUIDE.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |        |
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ITEM #3. ADDRESS(ES) WHERE LICENSED MATERIAL WILL BE USED OR POSSESSED

Locations of use: Walter Reed Army Medical Center, Washington, D.C.; WRAMC Forest Glen Section and Annex, Silver Spring, Maryland; Walter Reed Army Institute of Research Animal Holding Facility, Fort Meade, Maryland; U.S. Army Medical Laboratory, WRAMC Department of Pathology, Fort Meade, Maryland; U.S. Army Institute of Dental Research Facility, Fort Meade, Maryland; Rickman Building, 13 Taft Court, Rockville, Maryland; Key West Research Center, 9620 Medical Center Drive, Rockville, Maryland; and The Gillette Building, 1413 Research Boulevard, Rockville, Maryland.

#### ITEM #5 RADIOACTIVE MATERIAL and ITEM #6 PURPOSE(S) FOR WHICH LICENSED MATERIAL WILL BE USED

| CHI                     | EMICAL AND MASS<br>NUMBER                          | CHEMICAL AND<br>PHYSICAL FORM  | MAXIMUM<br><u>ACTIVITY</u>                                                                   | AUTHORIZED USE                                                                                                               |
|-------------------------|----------------------------------------------------|--------------------------------|----------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| A.<br>mat<br>atc<br>3-8 | Any byproduct<br>cerial with<br>omic numbers<br>33 | A. Any                         | A. 400 mCi<br>of each<br>radionuclide<br>with a total<br>possession<br>limit of<br>26 curies | A. through R.<br>Medical research,<br>diagnosis, and<br>therapy; research<br>and development<br>as defined in<br>10 CFR 30.4 |
| , B.                    | Iodine 131                                         | B. Any                         | B. 2 curies                                                                                  |                                                                                                                              |
| Ċι                      | Xenon 133                                          | C. Any                         | C. 2 curies                                                                                  |                                                                                                                              |
| D.                      | Krypton 85                                         | D. Any                         | D. 1 curie                                                                                   |                                                                                                                              |
| Ε.                      | Phosphorus 32                                      | E. Any                         | E. 2 curies                                                                                  | · .                                                                                                                          |
| F.                      | Carbon 14                                          | F. Any                         | F. 2 curies                                                                                  | · .                                                                                                                          |
| G.                      | Iodine 125                                         | G. Any                         | G. 1 curie                                                                                   |                                                                                                                              |
| н.                      | Iridium 192                                        | H. Any                         | н.,                                                                                          |                                                                                                                              |
| I.                      | Chromium 51                                        | I. Any                         | I. 750 mCi                                                                                   |                                                                                                                              |
| J.                      | Sulfur 35                                          | J. Any                         | J. 1 curie                                                                                   | <i></i>                                                                                                                      |
| к.                      | Hydrogen 3                                         | K. Any                         | K. 5 curies                                                                                  |                                                                                                                              |
| L.                      | Molybdenum 99                                      | L. Molybdenum<br>99/Technetium | L. 23 curies                                                                                 | · · ·                                                                                                                        |
|                         |                                                    | 99m Generators                 |                                                                                              | •                                                                                                                            |
| Μ.                      | Technetium 99m                                     | M. Any                         | M. 23 curies                                                                                 |                                                                                                                              |
| N.                      | Strontium 90                                       | N. Sealed<br>sources           | N                                                                                            | •<br>                                                                                                                        |
| ο.                      | Cesium 137                                         | 0. Sealed<br>sources           | 0.                                                                                           |                                                                                                                              |
| P.                      | Gadolinium 153                                     | P. Sealed<br>sources           | P.                                                                                           |                                                                                                                              |

 $1 \times 2$ 

| CHEMICAL AND MASS<br>NUMBER            | CHEMICAL AND<br>PHYSICAL FORM                                              | MAXIMUM<br>ACTIVITY                            | AUTHORIZED USE                                              |
|----------------------------------------|----------------------------------------------------------------------------|------------------------------------------------|-------------------------------------------------------------|
| Q. Iodine 125                          | Q. Sealed<br>sources<br>(Norland model<br>178A591A, AECL<br>Models C235 or | Q. 4 sources,<br>not to exceed<br>300 mCi each |                                                             |
| R. Iodine 125                          | C324, or Amersh<br>Corp. Model IMC<br>R. Sealed<br>sources                 | am<br>.P2)<br>R. 500 mCi                       |                                                             |
| S. Cesium 137                          | (3M Company see<br>S. Sealed<br>sources                                    | ds)<br>S.[                                     | S. through X.<br>Research and                               |
| T. Cobalt 60                           | T. Sealed                                                                  | т.                                             | development as<br>defined in 10 CFR                         |
| U. Americium 241<br>V. Americium 241   | U. Any<br>V. Sealed                                                        | U. 100 uCi<br>V.                               | 30.4; teaching                                              |
| W. Nickel 63                           | W. Sealed                                                                  | W. 1 curie                                     |                                                             |
|                                        | sources<br>and foils                                                       | · · · · ·                                      |                                                             |
| X. Iodine 129                          | X. Sealed<br>sources                                                       | X. 1 curie                                     |                                                             |
| Y. Thorium<br>Z. Uranium               | Y. Any<br>Z. Any                                                           | Y. 5 kgms<br>Z. 50 kgms                        | Y. and Z. Teaching<br>and laboratory<br>research            |
| AA. Uranium depleted<br>in Uranium 235 | AA. Plated<br>metal                                                        | AA. 400 kgms                                   | AA. Shielding                                               |
| BB. Americium 241                      | BB. Sealed<br>sources                                                      | BB.                                            | BB. Standards and reference sources                         |
| CC. Cesium 137                         | CC. Sealed<br>source                                                       | cc.                                            | CC. In an Eberline<br>Instrument Corp.<br>Model 8150-150 CS |
| DD. Cesium 137                         | DD. Sealed                                                                 | DD.                                            | DD. instrument                                              |
|                                        | sources 7                                                                  |                                                | Jcalibration                                                |

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## ITEM #7

7.1 and 7.2 Licensed material shall be used by or under the supervision of individuals designated by the Walter Reed Army Medical Center Radiation Control Committee. The training and experience of authorized users will be evaluated using the criteria in 10 CFR 35, Subpart J. The Radiation Control Committee may grant case-by-case exceptions.

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| CHEMICAL AND MASS<br>NUMBER          | CHEMICAL AND<br>PHYSICAL FORM                                                                 | MAXIMUM<br>ACTIVITY AUTHORIZED USE                                                |
|--------------------------------------|-----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| Q. Iodine 125                        | Q. Sealed<br>sources<br>(Norland model<br>178A591A, AECL<br>Models C235 or<br>C324, or Amersh | Q. 4 sources,<br>not to exceed<br>300 mCi each<br>am                              |
| R. Iodine 125                        | Corp. Model IMC<br>R. Sealed<br>sources                                                       | .P2)<br>R. 500 mCi                                                                |
| S. Cesium 137                        | (3M Company see<br>S. Sealed<br>sources                                                       | ds)<br>S. S. through X.<br>Research and                                           |
| T. Cobalt 60                         | T. Sealed                                                                                     | T. development as                                                                 |
| U. Americium 241<br>V. Americium 241 | U. Any<br>V. Sealed<br>, sources                                                              | U. 100 uCi 30.4; teaching                                                         |
| W. Nickel 63                         | W. Sealed<br>sources                                                                          | W. 1 curie                                                                        |
| X. Iodine 129                        | X. Sealed<br>sources                                                                          | X. 1 curie                                                                        |
| Y. Thorium<br>Z. Uranium             | Y. Any<br>Z. Any                                                                              | Y. 5 kgms Y. and Z. Teaching<br>Z. 50 kgms and laboratory<br>research             |
| AA. Uranium depleted                 | AA. Plated                                                                                    | AA. 400 kgms AA. Shielding                                                        |
| BB. Americium 241                    | BB. Sealed                                                                                    | BB. Standards and                                                                 |
| CC. Cesium 137                       | CC. Seated<br>source                                                                          | CC. In an Eberline<br>Instrument Corp.<br>Model 8150-150 CS<br>for calibration of |
| DD. Cesium 137                       | DD. Sealed                                                                                    | DD DD. instruments<br>calibration                                                 |
|                                      |                                                                                               |                                                                                   |

## ITEM #7

7.1 and 7.2 Licensed material shall be used by or under the supervision of individuals designated by the Walter Reed Army Medical Center Radiation Control Committee. The training and experience of authorized users will be evaluated using the criteria in 10 CFR 35, Subpart J. The Radiation Control Committee may grant case-by-case exceptions.

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7.3 Radiation Safety Officer: Lieutenant Colonel Arthur G. Samiljan, Chief, Health Physics Office, Walter Reed Army Medical Center. Training and experience included at ATT 7.3.

ITEM #8 We will establish and implement the model training program that was published in Appendix A to Regulatory Guide 10.8, Revision 2, and have appended a table ATT 8.1 that identifies the groups of workers who will receive training and the method and frequency of training.

#### ITEM #9

9.1 Enclosed at ATT 9.1 are drawings of the nuclear medicine area, a detailed drawing of the nuclear pharmacy and the source storage area in radiation therapy. The research laboratories at Walter Reed are basic biomedical research facilities with impervious floors, walls and counter tops and whatever equipment is needed for the specific research and isotopes involved. All isotope laboratories are evaluated by the Health Physics Office and approved by the Radiation Control Committee.

9.2 We will establish and implement the model procedure for calibrating survey instruments that was published in Appendix B to Regulatory Guide 10.8, Revision 2.

9.3 We will establish and implement the model procedure for calibrating our dose calibrator that was published in Appendix C to Regulatory Guide 10.8, Revision 2.

9.4 We will establish and implement the model personnel external exposure monitoring program published in Appendix D to Regulatory Guide 10.8, Revision 2, with the exception that some of our personnel who have been shown to receive much less than the ALARA limit have their monitors changed on a quarterly basis.

9.5 NA

9.6 See ATT 9.6

ITEM #10

10.1 The Charter for the Radiation Control Committee and the delegation of authority for the Radiation Protection Officer are addressed in an ARMY Technical Bulletin (TB MED 525). The duties of each are included at ATT 10.1.1. Walter Reed AMC also has a regulation which lists all standing committees at WRAMC including the Radiation Control Committee. The Composition of the RCC will include:

Deputy Commander (Chairman) Chief, Department of Medicine Chief, Department of Nursing Chief, Department of Pathology and Area Lab Services Chief, Department of Radiology



Chief, Radiation Therapy Service Chief, Nuclear Medicine Service Health Physics Officer (RPO) Senior Nuclear Pharmacist Assistant Health Physics Officer (alternate RPO) (Recorder) Director, WRAIR Radiation Safety Officer, WRAIR Radiation Protection Officer, AFIP

We will also include any others required by 10 CFR 35. The orders delegating authority to Lieutenant Colonel Samiljan are included at ATT 10.1.2.

10.2 We will establish and implement the model ALARA program published in Appendix G to Regulatory Guide 10.8, Revision 2.

10.3 We will establish and implement the model procedure for leak-testing sealed sources that was published in Appendix H to Regulatory Guide 10.8, Revision 2.

10.4 We will establish and implement the model safety rules published in Appendix I to Regulatory Guide 10.8, Revision 2.

10.5 We will establish and implement the model spill procedures published in Appendix J to Regulatory Guide 10.8, Revision 2.

10.6 We will establish and implement the model guidance for ordering and receiving radioactive material that was published in Appendix K to Regulatory Guide 10.8, Revision 2.

10.7 We will establish and implement the model procedure for opening packages that was published in Appendix L to Regulatory Guide 10.8, Revision 2.

10.8 We will establish and implement the model procedure for a unit dosage record system that was published in Appendix M.1 to Regulatory Guide 10.8, Revision 2.

10.9 We will establish and implement the model procedure for a multidose vial record system that was published in Appendix M.2 to Regulatory Guide 10.8, Revision 2.

10.10 We will establish and implement the model procedure for measuring and recording molybdenum concentration that was published in Appendix M.3 to Regulatory Guide 10.8, Revision 2.

10.11 We will establish and implement the model procedure for keeping an inventory of implant sources that was published in Appendix M.4 to Regulatory Guide 10.8, Revision 2.

10.12 We will establish and implement the model procedure for area surveys that was published in Appendix N to Regulatory Guide 10.8, Revision 2.





10.13.1 We will collect spent noble gas in a shielded trap and monitor the trap effluent with an air contamination monitor that we will check regularly according to the manufacturer's instructions.

10.13.2 We will collect spent aerosol in a shielded, single-use trap.

10.13.3 We will follow the model procedure for calculating airborne effluent concentration that was published in Appendix 0.2 to Regulatory Guide 10.8, Revision 2.

10.13.4 We will calculate spilled gas clearance times according to the procedure that was published in Appendix 0.4 to Regulatory Guide 10.8, Revision 2.

10.14 We will establish and implement the model procedure for radiation safety during radiopharmaceutical therapy that was published in Appendix P to Regulatory Guide 10.8, Revision 2, except for the provision at ATT 10.14.

10.15 We will establish and implement the model procedure for radiation safety during implant therapy that was published in Appendix Q to Regulatory Guide 10.8, Revision 2.

10.16 General Safety Proceedures See ATT 10.16

**ITEM #11** 

11.1 We will establish and implement the general guidance and model procedures for waste disposal that were published in Appendix R to Regulatory Guide 10.8, Revision 2, except for the provision to hold for decay-in-storage material with a physical half-life of less than 90 days, as previously approved by the NRC (see ATT 11.1.1, ATT 11.1.2, and ATT 11.1.3). We also generate a large volume of RIA waste at the Drug Testing Lab at Ft. Meade (25 drums per month and increasing) which we would like to be able to hold for decay for only 5 half-lifes and dispose of, if all other conditions are meet. This waste is mostly empty, washed test tubes which are only minimally contaminated prior to the decay in storage process. This waste is generated at a location were RIA kits are the only radioactive material use and the waste is kept segregated from all other laboratory waste in separate sealed 55 gal. drums.

11.2 See Item 11.1.

| •                                                                                                                                                                                  | •                                                                                                                                                              | OF A      | TRAINING AND EXI<br>UTHORIZED RADIO                                                                | PERIENCE                                                                              |                                        |                                                                                              | •                                                                                                  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|----------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|----------------------------------------|----------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|
| NAME OF AU                                                                                                                                                                         | THORIZED USER (Last, F                                                                                                                                         | irst, ML) |                                                                                                    |                                                                                       | 2. 5                                   | TATE OR TH                                                                                   | ERRITORY IN<br>SED:                                                                                |
| SAMTLJA                                                                                                                                                                            | N. ARTHUR G.                                                                                                                                                   |           |                                                                                                    |                                                                                       |                                        |                                                                                              | 10                                                                                                 |
| NK/GRADE                                                                                                                                                                           | ORGANIZATION                                                                                                                                                   | ORGAN     | IZATIONAL DIVISION                                                                                 | BLOG. ROOM NO.                                                                        |                                        | WRANC AU                                                                                     | THORIZATION                                                                                        |
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| an a | 6. EXPERIEN                              | CE WITH RADIATION (Actual use of Radiois                       | otopes) (Sealed or unscaled source) | ,                                       |
|------------------------------------------|------------------------------------------|----------------------------------------------------------------|-------------------------------------|-----------------------------------------|
| ISOTOPE                                  | NAXIMUM AMOUNT                           | WHERE EXPERIENCE WAS GAINED                                    | DURATION OF EXPERIENCE              | TYPE OF USE                             |
| In 111<br>Cs 137<br>Pu 239<br>Am 241     | lmCi<br>mCi<br>Ci<br>Ci                  | University of FL<br>U of F1, Johnston Isl<br>Johnston Isl<br>" | 6 Mo<br>18 Mo<br>12 Mo<br>12 Mo     | research<br>Inst Calib<br>Clean up<br>" |
| P 32<br>H 3<br>C 14<br>I 131             | mCi<br>"<br>"                            | WRAMC                                                          | 28 Mo<br>"<br>"                     | Rad Prot<br>"<br>"                      |
|                                          |                                          |                                                                |                                     |                                         |
|                                          | -                                        |                                                                |                                     |                                         |
|                                          | 7. EXPE                                  | RIENCE WITH RADIATION PRODUCING DEV                            | /ICES (X-ray, Irradiators, etc.)    |                                         |
|                                          | DEVICE                                   | WHERE EXPERIENCE WAS GAINED                                    | DURATION OF EXPERIENCE              | TYPE OF USE                             |
| Co 60<br>50-30<br>syste                  | Irradiator<br>O kVp x-ray '<br>ms        | University of FL<br>WRAMC                                      | 6 Mo<br>28 Mo                       | research<br>compliance                  |
|                                          |                                          |                                                                |                                     | -                                       |
|                                          |                                          |                                                                |                                     | · · ·                                   |
|                                          |                                          |                                                                |                                     |                                         |
| 8. CERTIF<br>t cortify the               | itCATION:<br>It the information provided | i hereon is true and complete to the best of my                | knowledge.                          | <u>.</u>                                |
|                                          | V Dec 92                                 |                                                                | Min Samo                            |                                         |

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PAGE 2, WRANC FORM 1843 (PREVIOUS EDITIONS ARE OBSOLETE)

### CURRICULUM VITAE

#### for

#### ARTHUR G. SAMILJAN, Lieutenant Colonel

DATE AND PLACE OF BIRTH:

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YEARS OF ACTIVE MILITARY SERVICE: 20 years

PRESENT ASSIGNMENT: (21 Jun 91 to present) Chief, Health Physics Office; RPO Walter Reed Army Medical Center, Washington, DC 20307-5001

MILITARY EDUCATION (pertinent to radiation protection):

- 1. Medical Effects of Nuclear Weapons Course, 8-12 Sep 86 Armed Forces Radiobiology Research Institute Bethesda, Maryland
- 2. Army Medical Department Physics and Military Medicine Course, 26-30 Oct 87 U.S. Army Environmental Hygiene Agency Aberdeen Proving Ground, Maryland

(included presentations on management of radiation protection programs and topical radiation protection issues)

- 3. Radiological Hazards Associated with Depleted Uranium Munitions Course, 16-20 Nov 87 U.S. Army, Belvoir Research, Development & Engineering Center, Fort Belvoir, Virginia
- 4. Laser Microwave Hazards Workshop, 25-29 Apr 88 U.S. Army Environmental Hygiene Agency Aberdeen Proving Ground, Maryland
- 5. The Army Medical Department Radiation Health Sciences Course, 24-28 Oct 88 U.S. Army Environmental Hygiene Agency Aberdeen Proving Ground, Maryland

(included presentations on management of radiation protection programs and topical radiation protection issues)

 Senior Officer Nuclear Accident Course, 24-27 Apr 89 InterService Nuclear Weapons School Kirtland Air Force Base, New Mexico

#### MILITARY EDUCATION (continued):

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- 7. Management of Radiation Accidents and Emergency Preparedness Training Course, 5-9 Jun 89 U.S. Army, Belvoir Research, Development & Engineering Center, Fort Belvoir, Virginia
- Nuclear Weapons Incident Seminar, 7-8 Mar 91 Naval Base Norfolk, Virginia
- 9. Medical X-Ray Survey Techniques Course, 15-26 Apr 91 Academy of Health Sciences Fort Sam Houston, Texas

**<u>CIVILIAN EDUCATION</u>** (relative to radiation protection):

Graduate Study leading to Master of Science Degree in Environmental Engineering (emphasis in Health Physics) Aug 84 - Dec 85 University of Florida Gainesville, Florida

#### HEALTH PHYSICS EXPERIENCE:

 Nuclear, Biological, and Chemical Officer Mar 76 - Jun 77 44th Medical Brigade Fort Bragg, North Carolina

(included designing and supervising the training of 100 personnel in battle field radiation detection, survey techniques, monitoring, decontamination, and protection)

 Nuclear, Biological, and Chemical Officer Jun 77 - Dec 78
 5th General Hospital Bad Cannstatt, Germany

(included designing and supervising the training of 350 personnel in battle field radiation detection, survey techniques, monitoring, decontamination, and protection)

3. Manager, Department of the Army, Nuclear Test Personnel Review Jan 86 - Dec 87 Environmental Support Group Washington, DC

(included the identification, dose assessments, and notification of all Army personnel who participated in the atmospheric nuclear testing program from 1944 to 1963. 4. Medical Health Physics Consultant Dec 87 - Jun 89 Headquarters, Army Materiel Command Office of the Command Surgeon Alexandria, Virginia

(included being the Commanding General's action officer for health aspects of ionizing and nonionizing radiation as applied to the command's workforce, and technical advisor on health hazard assessment of new materiel and to related materiel management processes)

5. Contract Manager, Johnston Island Plutonium Clean-up Project Jun 89 - Aug 90 Field Command Defense Nuclear Agency Johnston Atoll

(included planning, directing, and supervising the clean-up project, conducting radiological site surveys, and establishing procedures for packaging, storing, and disposal of radioactive waste)

6. Chief, Operations Branch/Assistant RPO Aug 90 - Jun 91 Health Physics Office Walter Reed Army Medical Center Washington, DC

(included reviewing x-ray compliance surveys and radioisotope laboratory room surveys, monitoring radiation therapy procedures, performing x-ray shielding evaluations and dose assessments, and assisting the RPO in the preparation and execution of all radiation protection policies in support of the medical center's NRC license, and ionizing and nonionizing radiation producing devices)

7. Chief, Health Physics Office/Radiation Protection Officer Jun 91 - Present Health Physics Office Walter Reed Army Medical Center Washington, DC

(Manage 20 health physicists and health physics technicians providing radiation safety support to Walter Reed Army Medical Center, Walter Reed Army Institute of Research, Armed Forces Institute of Pathology, and other federal agencies in the Washington, DC regional area. Executive agent for two NRC Licenses.)

## ATTACHMENT 7.3

| GROUP              | METHOD           | FREQUENCY |
|--------------------|------------------|-----------|
| Authorized Users   | Lecture          | Annually  |
| Ward Nursing Staff | Lecture or Video | Annually  |
| Radiation Therapy  | Lecture or Video | Annually  |
| Housekeeping       | Lecture or Video | Annually  |
| Maintenance        | Lecture or Video | Annually  |
| Security           | Lecture or Video | Annually  |
| Firefighters       | Lecture or Video | Annually  |

# ATT 8.1

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## ATT 9.6

In addition to the Facilities described in Item 9.1 the following equipment and control systems are available as required for the safe handling of radioactive material:

o Remote handling equipment including jaws, vices, forceps, and remote handling tongs of varying lengths.

o Storage containers including steel safes, lead lined boxes, steel drums, lead pigs, and lead storage containers both fixed and movable.

o Shielding including movable lead shields for shielding patients, L shields both lead and plastic, and shielding materials (e.g. lead bricks, lead shot, lead wool, plastic sheet etc.).

o Radiation measuring and counting equipment including liquid scintillation counting systems, gamma well counting systems, alpha gas flow counting systems, portable surveys instruments including GM, Ion chamber, and Scintillation detectors.

o Ventilation Control systems including Fume hoods with HEPA particulate filters, and iodination filter boxes with charcoal filters and charcoal sampling systems for use with volatile isotopes.

#### ATTACHMENT 9.6

#### ATT 10.1.1

f. The Radiation Control Committee will--

(1) Meet at least quarterly and at the call of the chairman.

(2) Recommend approval or disapproval of each type of radiation source from the standpoint of radiological health and safety of patients and working personnel and other factors established for the medical use of these sources.

(3) Recommend individual users for each type of procedure with each individual radionuclide and ensure that any physician authorized to use radioactive material in humans meets the criteria specified in part 35, title 10, Code of Federal Regulations (10 CFR 35). Recommendations will be consistent with the limits and conditions of the NRC license and DARA.

(4) Recommend individual pharmacists and individual compounding protocols for compounding radioactive drugs (radiopharmaceuticals) or radiopharmaceutical kits to be administered to patients (if the procedure is permitted to be performed by NRC license or DARA).

(5) Prescribe, if required, special conditions to be permitted in the work area and special procedures or work rules for use of radiation sources.

(6) Formulate and review the radiation protection training program.

(7) Monitor radiation exposures within the command and recommend actions to keep exposures as low as is reasonably achievable (ALARA). As a minimum, the collective dose to all radiation workers, average dose, and highest individual dose will be reviewed at quarterly meetings.

(8) Formally review, at least annually, the policies and procedures established to maintain low exposures.

(9) Approve the training and experience of the nuclear pharmacist.

g. The RPO, in addition to the responsibilities in 10 CFR 35, 21, will--

(1) Exercise staff supervision over the Radiation Protection Program.

(2) Provide consultation and advice on the degree of hazards associated with radiation and effectiveness of control measures.

(3) Advise and assist the commander and radiation workers in all matters pertaining to radiation protection, including instructing and training of workers (users) and others in the safe use of protective equipment and radiation producing devices.

(4) Ensure all radioactive materials are properly receipted, used, stored, handled, shipped, and disposed of according to applicable directives.

(5) Formulate and implement the Radiation Protection Program.

(6) Formulate, implement, and supervise an active, aggressive, documented program designed to keep radiation doses to levels which are ALARA. (7) Review the current and proposed uses of radiation sources for compliance with regulations and approved procedures.

(8) Review standing operating procedures for operations involving sources of ionizing radiation before submission to the Radiation Control Committee.

(9) Review procurement of all radioactive materials to ensure compliance with NRC licenses or DARA conditions.

(10) Ensure radiation survey and/or detection instruments used in radiation protection are properly calibrated and are available to radiation workers.

(11) Ensure all radiation shields, containers, and handling equipment are maintained in satisfactory condition.

(12) Ensure the required radiation warning signs are posted.

(13) Ensure that a physical inventory of radioactive materials is conducted every 3 months.

(14) Ensure that radiation surveys are performed at least quarterly and that leak tests are performed semiannually (NRC Reg Guide No. 8.23).

(15) Evaluate hazard potential and adequacy of protective measures for existing and proposed operations.

(16) Monitor situations where higher than normal levels of radiation or radioactive contaminants are suspected.

(17) Investigate radiation accidents and incidents and overexposures to determine the cause and take steps to prevent recurrence.

(18) Terminate a program or procedure involving the use of radioactive material or radiation producing devices which are determined to be a medical threat to health and property.

(19) Keep all licenses and DARAs up to date and initiate amendments and requests for renewals when appropriate.

(20) Maintain a current registry of ionizing radiation producing devices, such as x-ray machines, per TB MED 521.

#### ATTACHMENT 10.1.1

10.13.1 We will collect spent noble gas in a shielded trap and monitor the trap effluent with an air contamination monitor that we will check regularly according to the manufacturer's instructions.

10.13.2 We will collect spent aerosol in a shielded, single-use trap.

10.13.3 We will follow the model procedure for calculating airborne effluent concentration that was published in Appendix 0.2 to Regulatory Guide 10.8, Revision 2.

10.13.4 We will calculate spilled gas clearance times according to the procedure that was published in Appendix 0.4 to Regulatory Guide 10.8, Revision 2.

10.14 We will establish and implement the model procedure for radiation safety during radiopharmaceutical therapy that was published in Appendix P to Regulatory Guide 10.8, Revision 2, except for the provision at ATT 10.14.

10.15 We will establish and implement the model procedure for radiation safety during implant therapy that was published in Appendix Q to Regulatory Guide 10.8, Revision 2.

10.16 General Safety Proceedures See ATT 10.16

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ITEM #11

11.1 We will establish and implement the general guidance and model procedures for waste disposal that were published in Appendix R to Regulatory Guide 10.8, Revision 2, except for the provision to hold for decay-in-storage material with a physical half-life of less than 90 days, as previously approved by the NRC (see ATT 11.1.1, ATT 11.1.2, and ATT 11.1.3). We also generate a large volume of RIA waste at the Drug Testing Lab at Ft. Meade (25 drums per month and increasing) which we would like to be able to hold for decay for only 5 half-lifes and dispose of, if all other conditions are meet. This waste is mostly empty, washed test tubes which are only minimally contaminated prior to the decay in storage process. This waste is generated at a location were RIA kits are the only radioactive material use and the waste is kept segregated from all other laboratory waste in separate sealed 55 gal. drums.

11.2 See Item 11.1.

Department of the Army

ii. The action levels are determined to be ALARA based upon consideration of worker, environmental, and public exposures.

-2-

Submit a description of the procedures to be followed to determine these criteria are met.

We will continue our review upon receipt of this information. Please reply in <u>duplicate</u> to my attention at the Region I office and refer to Mail Control No. 116472. The reviewer for this licensing action is Pamela Henderson. If you have any technical questions regarding this deficiency letter please call the reviewer at (215) 337-6952.

If we do not receive a reply from you within 30 calendar days from the date of this letter, we shall assume that you do not wish to pursue your application.

Sincerely,

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Jenny M. Johansen, Chief Medical Licensing Section Division of Radiation Safety and Safeguards

Enclosure: Regulatory Guide 8.23

ATTACHMENT 10.14

DEPARTMENT OF THE ARMY WALTER REED ARMY MEDICAL CENTER WASHINGTON, DC 20307-5001 C----



REPLY TO ATTENTION OF:

24 November 1992

Health Physics Office

United States Nuclear Regulatory Commission Attention: Chief, Medical Licensing Section Division of Radiation Safety and Safeguards 475 Allendale Road King of Prussia, Pennsylvania 19406-1415

Dear Ms. Jenny M. Johansen:

We provide the following information in reference to Mail Control No. 116472 and in response to your memo, dated 16 November 1992, requesting additional information concerning our dedicated iodine-131 therapy room.

As a matter of standing operating procedure, the dedicated therapy room, Room 7437, remains <u>closed</u> and <u>locked</u> when there are no iodine therapies. Only the Health Physics Office possesses a key to that room.

Decontamination limits for this room will be the restricted area action limits established in NRC Regulatory Guide 8.23, "Radiation Safety in Medical Institutions". Health Physics Office personnel will decontaminate the room below this level of removable contamination prior to admittance of an iodine-131 radiation therapy patient into Room 7437.

We hope that this information will satisfy your questions and permit you to grant our exemption to 10 CFR 35.315(a)(7). We appreciate your prompt attention to this matter.

Your point of contact for this matter is the undersigned at (301)-427-5104/5107.

Sincerely,

ARTHUE G. SAVILJAN Lieutenant Colonel, US Army Health Physics Officer

### ATT 10.16

Following are general rules for the safe use of radioactive materials:

1. Wear laboratory coats or other protective clothing at all times in areas where radioactive materials are used.

2. Wear disposable gloves at all times while handling radioactive materials.

3. Monitor hands and clothing for contamination after each procedure or before leaving area.

4. Do not eat, drink smoke, or apply cosmetics in any area where radioactive material is stored or used.

5. Wear assigned personnel monitoring device(s) at all times while in areas where radioactive materials are used or stored. Whole body monitoring device(s) should be worn at chest or waist level.

6. Dispose of radioactive waste only in specifically designated receptacles.

7. Never pipette by mouth.

8. Confine radioactive solutions in covered containers plainly identified and labeled with name of compound, radionuclide, date activity, and radiation level, if applicable

9. Always transport radioactive materials in appropriate shielding and containers.

DEPARTMENT OF THE ARMY WALTER REED ARMY MEDICAL CENTER WASHINGTON, D.C. 20307-5001

REPLY TO ATTENTION OF:

10 30% 1953

HSHL-H-HP (385-11m)

MEMORANDUM THRU

Commander, US Army Health Services Command, ATTN: HSCL-P, Fort Sam Houston, TX 78234-6000

HQDA (SGPS-PSP-E), 5109 Leesburg Pike, Falls Church, VA 22041-3258

FOR US Nuclear Regulatory Commission, Region I, Nuclear Material Safety Section A, 475 Allendale Road, King of Prussia, PA 19406

SUBJECT: Amendment of US Nuclear Regulatory Commission License No. 08-01738-02

1. Request that NRC License No. 08-01738-02 for Walter Reed Army Medical Center be amended to reflect a change in the Radiation Safety Officer from 1Lt. Allen W. Anthony to LTC Peter H. Myers. LTC Myers has been assigned as the Chief, Health Physics Office at Walter Reed AMC since August 1989. A Training and Experience Form and a Curriculum Vitae for LTC Myers are enclosed (Enclosures 1 and 2).

2. Request that Walter Reed's license also be amended to allow the holding for decay of radioactive waste containing isotopes with half lives up to ninety (90) days. We have been decaying waste with half lives of sixty five (65) days or less for a few years and have a good program for segregating, packaging, storing, and disposing of this material. We have the space to hold material for three (3) years instead of the current twenty two (22) months. Some protocols at Walter Reed use P-32 and S-35 in the same labs or even the same experiments, requiring that all the waste be packaged for burial because of the S-35 half life. Some animal studies use three (3) or four (4) different microspheres to measure blood flow at different time points in an experiment, Cr-51, Ru-103, and Ce-141 (all with half HSHL-H-HP SUBJECT: Amendment of US Nuclear Regulatory Commission License No. 08-01738-02

lives of less than sixty five (65) days) may be used with Sc-46 so all the waste has to be packaged for burial. This amendment would reduce our solid waste volume to the burial ground by 10-20%.

FOR THE COMMANDER:

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LTC, MS / Executive Officer

2 Encls



WALTER REED ARMY MEDICAL CENTER WASHINGTON, D.C. 20307-5001





HSHL-H-HP (385-11m)

15 March 1991

MEMORANDUM FOR US Nuclear Regulatory Commission, Region I, Nuclear Material Safety Section A, 475 Allendale Road, King of Prussia, PA 19406

SUBJECT: Amendment of US Nuclear Regulatory Commission License No. 08-01738-02. Additional information requested Docket No. 030-01317, Control No. 112925.

This is in reference to your request in a letter dated February 5, 1991 for additional information on our decay-in-storage program. The following information is provided in response to those questions.

1. The existing program for research waste with half-lives of 65 days or less generates 50-60 55gal. drums of compacted trash per year. The expected increase with half-lives of 90 days or less could raise the total to 60-75 drums per year. We currently hold this waste for 24 months to ensure at least 10 half-lives for the longest isotopes, which means we have between 100 and 120 drums in storage at any one time. Holding all our short halflife waste for 30 months could mean up to 185 drums in storage at any one time.

2. Enclosure 1 is a copy of one of the "Terms and Conditions" which all users of radioactive material at Walter Reed most follow. All the solid radioactive waste at Walter Reed is collected, screened, and packaged by the Health Physics Office. Bags of waste are examined by the health physics personnel when they are collected and again when they are compacted to ensure the proper segregation and defacing of any radioactive labels has occurred.

3. When the solid, short half-life, radioactive material is compacted it is in a 55 gal. steel drum (DOT 17H). The drum is sealed shut, the out side is marked with an I.D. number with an indelible marker, and the following information is recorded; the drum I.D., all isotopes in the drum and the initial activity of each, the date the drum was closed. When this drum is ready for disposal it is re-entered in a local disposal log and data base which includes; I.D. number, date closed, date disposed, survey instrument model, serial number and calibration date, background

HSHL-H-HP (385-11m) SUBJECT: Amendment of US Nuclear Regulatory Commission License No. 08-01738-02. Additional information requested Docket No. 030-01317, Control No. 112925.

readings, maximum readings of waste, and initials of person performing survey and waste disposal.

When the waste has been held for decay for at least 10 half-4 \_ lives of the longest half-life material present, the drums are moved to a low background area and surveyed with a portable survey meter with a remote GM or scintillation probe. If no readings above background are found the drums are opened and the material is surveyed again as it is removed from the drum. Currently we are using a Ludlum model 2 with a GM probe which is calibrated in mr/hr. The normal background is approximately 0.05 mr/hr which is 10% of full scale on the lowest scale. If I-125 is the major remaining contaminate a low energy gamma scintillation probe may also be used to ensure no external radiation levels above background are present. The waste when originally packaged contains at most a few millicuries of activity, after at least 10 half-lives it contains at most a few microcuries of activity and no measurable external exposure. In addition this waste will continue to decay in a land fill at the rate of at least 4 half-lives per year making the likelihood of any internal deposition remote. Any biological waste held for decay will be incinerated at the conclusion of the decay period which will preclude the ingestion of this material.

The medical waste in question will be compacted into 55 gal. 5. steel drums as outlined in question 3's response.

The waste storage facility at WRAMC is a decommissioned 6. research reactor facility. This building is constructed of concrete, concrete block and brick, it has no windows and very little flammable material involved in it's construction. This building is dry and heated and has a maximum capacity to hold two or three times the amount of waste we will be holding when this amendment is granted. This building is under the sole control of the Health Physics Office with steel doors and double locks at all entrances.

PETER H. MY LTC, MS Health Phybics Officer

1 Encl

#### HEALTH PHYSICS WALTER REED ARMY MEDICAL CENTER Washington, D.C. 20307-5001

#### CONDITION NO. 4

#### For

#### RADIOACTIVE MATERIAL AUTHORIZATIONS

#### RADIOACTIVE WASTE

1. <u>General</u>. Radioactive waste from Walter Reed Army Medical Center and tenant activities will be controlled, packaged, transported, and disposed of in accordance with AR 385-11, "Ionizing Radiation Protection;" Title 10, Code of Federal Regulations; Title 49, Code of Federal Regulations; Nuclear Regulatory Commission Licenses issued to WRAMC; applicable provisions of State Government requirements for waste disposal sites located within their jurisdiction; and the guidelines delineated herein.

#### 2. Definitions:

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> a. <u>Radioactive Material</u>: Any material or combination of materials that spontaneously emits gamma rays, X-rays, alpha particles, beta particles, neutrons, or other atomic particles that are capable of producing ions, directly or indirectly by their passage through matter.

b. <u>Radioactive Waste</u>: Surplus items containing radioactive material, property contaminated with radioactive material to the extent that decontamination is economically unsound, and materials that have become contaminated during possession/use of radioactive material.

c. <u>Activity</u>: The number of nuclear transitions (disintegrations) occurring in a given quantity of material per unit time (disintegrations per second); expressed in units of Curies or Becquerels.

d. <u>Specific Activity</u>: Total activity of a given radionuclide per gram of a compound, element, or radioactive nuclide.

e. <u>Curie</u>: The special unit of activity. One curie equals  $3.700 \times 10^{10}$  nuclear transitions per second. (Abbreviated Ci.). Several fractions of the curie are in common usage:

(1) <u>Microcurie</u>: One-millionth of a curie  $(3.7 \times 10^4 \text{ disintegrations})$  per sec.). Abbreviated  $\nu$ Ci.

(2) <u>Millicurie</u>: One-thousandth of a curie (3.7 X 10<sup>7</sup> disintegrations per sec.). Abbreviated mCi.

REVISION 2, effective 13 Apr 87

Enel 1

#### ATTACHMENT 11.1.2

CONDITION NO. 4 FOR RADIOACTIVE MATERIAL AUTHORIZATIONS (RADIOACTIVE WASTE)

- (12) Animal Carcasses/Animal Waste: Short half-life.
- (13) Animal Carcasses/Animal Waste: Long half-life.
- (14) <u>Animal Carcasses</u>:  $\leq$  0.05 Microcuries H-3 or C-14 per gram of animal tissue averaged over the entire weight of the animal.
- (15) Gas, Combustible.

• • • •

(16) Gas, Non-combustible.

b. Limiting the non-radioactive waste which is intermixed with radioactive waste to an absolute minimum.

c. Removing or obliterating all "Radioactive Material" labels on nonradioactive vendor shipping packages and on short half-life radioactive waste. Uncontaminated vendor shipping containers may be disposed of in the normal trash by the users. Short half-life waste will be delivered to Health Physics Office (HPO) collection points for subsequent storage, decay, and ultimate disposal in the normal trash when HPO personnel have determined that the waste has reached natural background radiation levels.

d. Storing used Mo-99/Tc-99m generators and other items of equipment containing radioactive material in designated areas only. The radiation labels will be removed on such items only when they reach background radiation levels.

e. Maintaining their inventory of radioactive waste to a practical minimum.

f. Controlling radioactive waste in their work areas to prevent unauthorized disposal by the custodial service. Magenta plastic bags will be used to contain radioactive waste. Magenta bags will not be used for other purposes.

g. Insuring that all radioactive waste is delivered to HPO collection point personnel for ultimate disposal.

h. Marking all radioactive waste containers with the radiation caution symbol and the words "Caution - Radioactive Waste" and/or "Caution -Radioactive Material." Plus "DO NOT EMPTY!"

i. Insuring that radioactive material is not released into the sanitary sewage system without the specific approval of the Health Physics Officer.

j. Insuring that decontamination of reusable equipment is only performed in laboratory sinks that have been authorized via their Radioactive Material Authorization. See <u>Section II</u> for specific requirements concerning this procedure.

3

#### CONDITION NO. 4 FOR RADIOACTIVE MATERIAL AUTHORIZATIONS (RADIOACTIVE WASTE)

i. Biological wastes (e.g., animal carcasses/animal waste) shall be prepared by the User in a manner that allows the waste to be readily packed in in a 30gallon drum alternating 10-inch layers of waste and packing materials. Prepared biological waste shall be placed in double magenta plastic bags and tagged as previously indicated.

> SECTION II - RELEASE OF RADIOACTIVITY INTO THE SANITARY SEWAGE SYSTEM

1. Liquid waste will be released to the sanitary sewage system in accordance with Title 10, Code of Federal Regulations, Chapter 1, Part 20.303 (i.e., 10 CFR 20).

2. Unless specifically authorized by the Health Physics Office, all releases of radioactive liquid to the sanitary sewerage system will be conducted by the Health Physics Office to assure that the quantity of radioactive material released into the system by combined WRAMC disposal procedures does not exceed the following limits:

a. The quantity of any licensed or other radioactive material released into the system by WRAMC in any one day does not exceed the larger of paragraphs a(1) or (2) below.

(1) The quantity which, if diluted by the average daily quantity of sewage released into the sewer by WRAMC will result in an average concentration equal to the limits specified in Appendix B, Table I, Column 2 of 10 CFR 20 or

(2) Ten times the quantity of such material specified in Appendix C of 10 CFR 20-and

b. The quantity of any licensed or other radioactive material released in any one month, if diluted by the average monthly quantity of water released by WRAMC, will not result in an average concentration exceeding the limits specified in Appendix B, Table I, Column 2 of 10 CFR 20 and

c. The gross quantity of licensed and other radioactive material, excluding hydrogen-3 and carbon-14, released into the sewerage system by WRAMC does not exceed one curie per year. The quantities of hydrogen-3 and carbon-14 released into the sanitary sewerage system may not exceed 5 curies per year for hydrogen-3 and 1 curie per year for carbon-14. Excreta from individuals undergoing medical diagnosis or therapy with radioactive material shall be exempt from any limitations contained in this document.

3. The following policy and procedures apply to all individuals permitted to release radioactive washings into the sanitary sewage system via laboratory sinks:

a. Such release approval must be specifically included in the Principal User's WRAMC Radioactive Material Authorization.

#### ATTACHMENT 11.1.2

#### CONDITION NO. 4 FOR RADIOACTIVE MATERIAL AUTHORIZATION (RADIOACTIVE WASTE)

#### SECTION IV - RADIOACTIVE WASTE DISPOSAL SUPPLIES

1. Items of supply for the containment and packaging of radioactive waste are stocked by the Supply and Administration Branch, Materiel Division, Directorate of Industrial Operations, WRAMC. The stockage items meet U.S. Army and Federal radioactive material packaging requirements for most of the radioactive waste resulting from laboratory and/or clinic procedures at WRAMC, WRAIR and AFIP. However, it should be noted that packaging requirements vary with the particular type, form and curie amount of the radioactive waste. Consequently, all personnel involved with the packaging of radioactive waste should consult the Health Physics Office in order to assure that the available stockage items meet packaging specification requirements for each particular radioactive waste disposal operation.

2. Following are the currently stocked items:

a. DRUM, Steel, DOT Specification 17-H, 30-gallon with gasket and sealing bolt. (Used as shipping container for the transport of radioactive biologicals).

b. DRUM, Steel, DOT Specification 17-H, 55-gallon with gasket and sealing bolt. (Used as a shipping container for the transport of low-level radioactive materials).

c. VERMICULITE, 4 cu ft bags. (Used as an absorbent material for the packaging of biological and liquid radioactive waste) - agricultural, Grade 4.

d. SLAKED LIME (Used to retard spoilage of biological radioactive waste).

e. BAG, Plastic, Magenta,  $20" \times 15" \times 60"$ , 4 mil thickness. (Used as a liner for large waste receptacle).

f. BAG, Plastic, Magenta,  $13" \times 12" \times 24"$ , 2 mil thickness. (Used as a liner for small laboratory radioactive waste receptacle).

g. DIATOMACEOUS EARTH, medium grade (floor dry #85), 2.5 cu ft bag. (Used as an absorbent material for packaging of liquid radioactive waste).

3. Additional items will be stocked or procured as required to meet the provisions of Federal/State regulatory agencies.

4. Principal Users are responsible for funding the costs of materials and supplies used to dispose of radioactive wastes. Although Principal Users will pay for the supplies they stock for use in their particular areas, the Health Physics Office, RMC Branch, will order and pick up the supplies needed to collect and package the radioactive waste received from the Principal Users. All orders placed by the Health Physics Office for radioactive waste disposal supplies for the hospital, WRAIR and AFIP will be funded by Clinical Investigation, Department of Pathology/Laboratory Services, Department of Radiology, WRAIR, or AFIP as appropriate.

ATTACHMENT 11.1.2

|                                                         |                       | MATERIAI                              | LS LICENSE                        | Amendment No. 61                               |
|---------------------------------------------------------|-----------------------|---------------------------------------|-----------------------------------|------------------------------------------------|
| Pursuant to the Atomic Ener                             | gy Act of 1954, as    | amended, the End                      | ergy Reorganization A             | Act of 1974 (Public Law 93-438), and Ti        |
| Code of Federal Regulations, C                          | hapter I, Parts 30, 3 | 1, 32, 33, 34, 35, 3                  | 9, 40 and 70, and in reli         | ance on statements and representations here    |
| made by the licensee, a license                         | is hereby issued aut  | norizing the licensee                 | to receive, acquire, po           | ssess, and transfer byproduct, source, and i   |
| to persons authorized to receive                        | it in accordance with | the regulations of the                | he applicable Part(s). Th         | is license shall be deemed to contain the con  |
| specified in Section 183 of the A                       | Atomic Energy Act o   | f 1954, as amended,                   | and is subject to all appl        | licable rules, regulations and orders of the N |
| Regulatory Commission now o                             | r hereafter in effect | and to any condition                  | ns specified below.               |                                                |
|                                                         | Licensee              | · · · · · · · · · · · · · · · · · · · | 1                                 |                                                |
| 1                                                       | Lee                   |                                       | In accordance                     | e with letter dated                            |
| L. Donautmont of the                                    | A                     |                                       | April 8, 199<br>3. License number | 32,<br>09-01739-02 is amonded in               |
| Walter Reed Army M                                      | ledical Cente         | r (WRAMC)                             | its entirety                      | v to read as follows:                          |
| 24 4 4 4 5 6                                            |                       |                                       |                                   |                                                |
| -washington, D.C.                                       | 2030/-5001            |                                       | 4. Expiration date                | April 30, 1993                                 |
|                                                         |                       |                                       | 5. Docket or                      |                                                |
| C. D                                                    |                       | 7 Chamical                            | Reference No.                     | 030-01317<br>8 Maximum amount that lines       |
| o. byproduct, source, and/o<br>special nuclear material | 1                     | form                                  | alot buasicat                     | may possess at any one time                    |
| - <b>- - - - - - - - - -</b>                            | · · ·                 | •                                     |                                   | under this license                             |
| •                                                       | •                     | · · ·                                 |                                   |                                                |
| A. Any byproduct mat                                    | terial with           | A. Any                                |                                   | A. 400 millicuries of e                        |
| atomic numbers 1-                                       | -83                   | •••••                                 | ·· _ * 4                          | radionuclide with a                            |
|                                                         |                       |                                       | •••                               | possession limit of                            |
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| C. Xenon 133                                            |                       | C. Any                                | ·· · ·                            | C. 2 curies                                    |
| D. Krypton 85                                           |                       | D. Any                                |                                   | D. 1 curie                                     |
| E. Gold 198                                             |                       | E. Any                                |                                   | E. 1 curie                                     |
| G. Carbon 14                                            |                       | r. Any<br>G. Anv                      |                                   | r. 2 curies<br>6. 2 curies                     |
| H. Iodine 125                                           |                       | H. Any                                |                                   | H. 1 curie                                     |
| I. Iridium 192                                          |                       | I. Any                                |                                   | 1.                                             |
| J. Chromium 51                                          |                       | J. Any                                |                                   | J. 750 millicuries                             |
| L. Hydrogen 3                                           |                       | N. ANY                                |                                   | K. I CULIE                                     |
| MMolybdenum 99                                          |                       | M. Molybden                           | um 99/.                           | M. 23 curies                                   |
| -                                                       |                       | Techneti                              | um 99m                            | - · · ·                                        |
| N Technotium 00m                                        |                       | Generato                              | rs .                              | N 23 curios                                    |
| 0. Strontium 90                                         |                       | 0. Sealed s                           | ources                            | 0.                                             |
| P. Cesium 137                                           |                       | P. Sealed s                           | ources                            | P.                                             |
| 0 0.1.7                                                 |                       |                                       |                                   |                                                |
| lų. Gadolinium 153<br>P. Lodino 125                     |                       | U. Sealed s                           | ources                            |                                                |
| R. 1001HE 125                                           |                       | K. Sealed Si<br>(Norland              | Jurces<br>Inst Co                 | K. HUU MILLICUFTES                             |
|                                                         |                       | Model 17                              | 8A591A)                           |                                                |
| S. Iodine 125                                           |                       | S. Sealed s                           | ources                            | S. 500 millicuries                             |
|                                                         |                       | (3M Comp                              | any seeds)                        | <b></b>                                        |
|                                                         |                       | I. Sealed s                           | ources                            | I. 4 sources, not to ex                        |
| T. Iodine 125                                           |                       | ALL MO                                | Amersham form                     | SOD MATTACALLES EACH                           |
| T. Iodine 125                                           |                       | [" <u>774</u> AM                      |                                   |                                                |
| T. Iodine 125                                           | ŗ                     | C324, or<br>Model IM                  | C.P2)                             |                                                |
| T. Iodine 125                                           | j .                   | C324, or<br>Model IM                  | C.P2)                             |                                                |
| T. Iodine 125                                           |                       | Model IM                              | C.P2)                             |                                                |

| IC Form 374A U.S. NU                 | AR REGULATORY COMMISSIC                                 |                                           | PAGE 2 OF                                                                                                       | A PAGE     |
|--------------------------------------|---------------------------------------------------------|-------------------------------------------|-----------------------------------------------------------------------------------------------------------------|------------|
| 54}                                  |                                                         | License number                            |                                                                                                                 |            |
| MATERIALS LI                         | ICENSE                                                  | Docket or Refer                           | 08-01738-02                                                                                                     |            |
| SUPPLEMENTARY                        | Y SHEET                                                 | S CARDE OF RAIDE                          |                                                                                                                 |            |
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|                                      |                                                         | <u> </u>                                  | Amendment No.                                                                                                   | _61        |
| Itoma E 7 8 0 continued              | n <sup>1</sup> .                                        |                                           | •.                                                                                                              |            |
| Items 6., 7. & o. continued          | 1)                                                      |                                           |                                                                                                                 | •          |
| . Byproduct, source, and/or          | 7. Chemical and/                                        | or physical                               | 8. Maximum amour                                                                                                | nt that    |
| special nuclear material             | form                                                    |                                           | licensee may                                                                                                    | possess at |
|                                      |                                                         |                                           | license                                                                                                         | under unt  |
|                                      |                                                         | ,<br>,                                    | an style of                                                                                                     | -1         |
| Cobalt 60                            | U. Sealed source                                        | S                                         | U.)                                                                                                             |            |
| . Americium 241                      | W. Anv                                                  | 3                                         | W. 100 microcuri                                                                                                | les /      |
| . Americium 241                      | X. Sealed source                                        | S -                                       | X.                                                                                                              | -          |
| · · · ·                              | 5                                                       | ~<br>. 1                                  | × ×                                                                                                             | •          |
| Nickel 63                            | Y Spatial course                                        | s and foile                               | Y 1 curto                                                                                                       |            |
| . Iodine 129                         | Z. Sealed source                                        | 5 and 10115.                              | Z. 1 curie                                                                                                      |            |
| A. Thorium                           | AA. Any                                                 |                                           | AA. 5 kilograms                                                                                                 |            |
| B. Uranium<br>C. Uranium deploted in | BB. Any                                                 |                                           | BB. 50 kilograms                                                                                                | 5          |
| Uranium 235                          | WW. FIGLEU MELAI                                        |                                           | UL. HUU KTIOGTA                                                                                                 |            |
| D. Americium 241                     | DD: Sealed sourc                                        | es                                        | DD.                                                                                                             |            |
| E. Cesium 137                        | EE Sealed sourc                                         | e 🙀                                       | EE.                                                                                                             |            |
| 1. <b>1.</b> 1.                      |                                                         | 5 J                                       |                                                                                                                 |            |
| F. Cesium 137                        | FF. Sealed sourc                                        | es.                                       | FF.                                                                                                             |            |
| 14                                   |                                                         | 7                                         | 5.<br>                                                                                                          |            |
| Authorized use                       |                                                         | An |                                                                                                                 | <u>.</u>   |
|                                      |                                                         |                                           | •                                                                                                               | •          |
| . through T. Medical research        | arch, diagnosis, and t                                  | herapy; resea                             | arch and developm                                                                                               | ent        |
| J. through Z. Research and           | development as define                                   | d in 10 CFR 3                             | 80.4: teaching.                                                                                                 |            |
| A. and BB. Teaching and              | laboratory research.                                    |                                           | , see and the second |            |
| CC. Shielding                        |                                                         |                                           |                                                                                                                 |            |
| E. In an                             | e sources.                                              |                                           | for calibration o                                                                                               | f          |
| instruments.                         |                                                         | · - · · · · · · · · · · · · · · · · · ·   |                                                                                                                 | •          |
| F. Instrument calibration            | •                                                       |                                           |                                                                                                                 |            |
|                                      | CONDITION                                               | c                                         | - <b></b>                                                                                                       | <u> </u>   |
|                                      |                                                         | . ·                                       |                                                                                                                 |            |
| 10. Location of use:                 | · · ·                                                   |                                           |                                                                                                                 |            |
| Walter Read Army Medic               | al Center Washington                                    | D C . WDAM                                | Forest flom Soc                                                                                                 | tion and   |
| Annex, Silver Spring.                | Maryland; Walter Reed                                   | Army Institu                              | te of Research An                                                                                               | imal Holdi |
| Facility, Fort Meade, 1              | Maryland; U.S. Army Me                                  | dical Labora                              | tory, WRAMC Depar                                                                                               | tment of   |
| Pathology, Fort Meade,               | Maryland; and U.S. Ar                                   | my Institute                              | of Dental Resear                                                                                                | ch Facilit |
| Research Center, 9620                | Medical Center Drive,                                   | art court, Re<br>Rockville, Ma            | aryland.                                                                                                        | u; ⊾ey wes |
| 11 Radiation Safety Offic            | are 176 Anthum 6 Sam                                    | nilian                                    | -                                                                                                               | •          |
| Nationation Salety UNIC              |                                                         | ויוטשווי                                  |                                                                                                                 |            |
|                                      | YX X                                                    |                                           | . •                                                                                                             |            |
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Pris. 1. ......

| NBC Fo | a 374                                       | A U.S. NU AR REGULATORY COMMISS                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                     |
|--------|---------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (5-84) |                                             |                                                                                                                                                                                                                                                                                     | License number                                                                                                                                                                                                                                      |
|        |                                             | MATERIALS LICENSE                                                                                                                                                                                                                                                                   | 08-01738-02                                                                                                                                                                                                                                         |
|        |                                             | SUPPLEMENTARY SHEET                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                     |
|        |                                             | · ·                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                     |
|        |                                             |                                                                                                                                                                                                                                                                                     | Amendment No. 61                                                                                                                                                                                                                                    |
| (Con   | tinue                                       | ed) CONDITIONS                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                     |
| 12.    | Α.                                          | Licensed material shall be used by, or designated by the licensee's Radiation Chairman.                                                                                                                                                                                             | under the supervision of, individuals<br>Safety Committee, Col. Joan T. Zajtchuk                                                                                                                                                                    |
|        | Β.                                          | The use of licensed material in or on<br>in Section 35.2 of 10 CFR Part 35.                                                                                                                                                                                                         | humans shall be by a physician as define                                                                                                                                                                                                            |
|        | С.                                          | Physicians designated to use licensed a training criteria established in 10 CF                                                                                                                                                                                                      | material in or on humans shall meet the<br>R Part 35, Subpart J.                                                                                                                                                                                    |
| 13.    | Exp<br>use                                  | erimental animals administered licensed<br>d for human consumption.                                                                                                                                                                                                                 | materials or their products shall not be                                                                                                                                                                                                            |
| 14.    | In<br>yel<br>lic<br>lic<br>or               | lieu of using the conventional radiation<br>low background) as provided in Section 2<br>ensee is hereby authorized to label dete<br>ensed material and used in gas chromatog<br>stamped radiation caution symbols withou                                                            | caution colors (magenta or purple on<br>0.203(a)(1), of 10 CFR Part 20, the<br>ctor cells and cell baths, containing<br>raphy devices, with conspicuously etched<br>t a color requirement.                                                          |
| 15.    | Det<br>wit<br>tem                           | ector cells containing titanium tritide<br>h a properly operating temperature contr<br>peratures from exceeding 225 degrees Cen                                                                                                                                                     | foil shall only be used in conjunction of mechanism which prevents foil tigrade.                                                                                                                                                                    |
| 16.    | Det<br>wit<br>tem                           | ector cells containing scandium tritide<br>h a properly operating temperature contr<br>peratures from exceeding 325 degrees Cen                                                                                                                                                     | foil shall only be used in conjunction<br>ol mechanism which prevents foil<br>tigrade.                                                                                                                                                              |
| 17.    | Not<br>for<br>Adm<br>Dru                    | withstanding the requirements of 10 CFR<br>medical use any byproduct material or r<br>ministration has accepted a "Notice of Cl<br>g" (IND).                                                                                                                                        | <b>35.49 (a) and (b), the licensee may use eagent kit for which the Food and Drug aimed Investigational Exemption for a Ne</b>                                                                                                                      |
| .18:   | The<br>10                                   | e licensee may transport licensed materia<br>CFR 71, "Packaging and Transportation of                                                                                                                                                                                               | l in accordance with the provisions of Radioactive Material."                                                                                                                                                                                       |
| 19.    | lf<br>lim<br>076<br>det<br>by<br><u>Pos</u> | only a single radionuclide specified in<br>nit is the quantity specified in <u>Schedule</u><br>7. If two or more radionuclides are pos<br>cermined as follows: the sum of the quot<br>the quantities of those radionuclides sp<br><u>esession Limits</u> , NUREG-0767 shall not exc | NUREG 0767, is possessed, the possession<br>of <u>Limiting Possession</u> Limits, NUREG-<br>sessed, the possession limit for each is<br>ients of the quantities possessed divide<br>ecified in the <u>Schedule</u> of <u>Limiting</u><br>eed unity. |
| 20.    | The<br>les                                  | e licensee is <mark>authorized to hold radioact</mark><br>ss than 90 days for decay-in-storage befo                                                                                                                                                                                 | ive material with a physical half-life o<br>re disposal in ordinary trash provided:                                                                                                                                                                 |
|        | Α.                                          | Radioactive waste to be disposed of in minimum of 10 half-lives.                                                                                                                                                                                                                    | this manner shall be held for decay a                                                                                                                                                                                                               |
|        |                                             |                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                     |
| 1      |                                             |                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                     |

| 5-84) | rm 374A                                                  | U.S. NU AR REGULATORY COMMISSION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | License number                                                                                                                                                                             |
|-------|----------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| •     |                                                          | MATERIALS LICENSE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 08=01738=02                                                                                                                                                                                |
|       | • •                                                      | SUPPLEMENTARY SHEET                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Docket or Reference number                                                                                                                                                                 |
|       |                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 030-01317                                                                                                                                                                                  |
|       |                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Amendment No. 61                                                                                                                                                                           |
| (20   | cont                                                     | inued) CONDITIONS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                            |
| (201  |                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                            |
|       | в.                                                       | determine that its radioactivity cannot<br>radiation labels shall be removed or obl                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | be distinguished from background. All iterated.                                                                                                                                            |
|       | C.                                                       | Generator columns shall be segregated so<br>to ensure decay to background levels prim                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | that they may be monitored separately or to disposal.                                                                                                                                      |
| 21.   | Exce<br>its<br>cont<br>Regu<br>repr<br>more              | pt as specifically provided otherwise in<br>program in accordance with the statements<br>ained in the documents, including any enc<br>latory Commission's regulations shall gov<br>resentations and procedures in the license<br>restrictive than the regulations.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | this license, the licensee shall conduc<br>, representations, and procedures<br>losures, listed below. The Nuclear<br>ern unless the statements,<br>e's application and correspondence are |
|       | A.<br>B.<br>D.<br>F.<br>G.<br>H.<br>J.<br>K.<br>N.<br>O. | Application dated July 18, 1979<br>Letter dated January 13, 1984<br>Letter dated May 8, 1987<br>Letter dated March 16, 1988<br>Letter dated March 28, 1988<br>Application dated August 5, 1988<br>Letter dated September 23, 1988<br>Letter dated July 28, 1989<br>Letter dated September 12, 1989<br>Letter dated January 19, 1990<br>Letter dated July 16, 1990<br>Letter dated July 16, 1991<br>Letter dated July 11, 1991<br>Paragraphs 4 and 5 of the letter dated Ap<br>Letter dated August 4, 1992                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | ril 8, 1992                                                                                                                                                                                |
|       |                                                          | And the second sec | and the second                                                                           |
|       |                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                            |
| •     |                                                          | · · · · · · · · · · · · · · · · · · ·                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                            |
|       |                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                            |
|       |                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                            |
|       |                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                            |
|       |                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                            |
|       |                                                          | · · · · · · · · · · · · · · · · · · ·                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                            |
|       |                                                          | For t                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | he U.S. Nuclear Regulatory Commission                                                                                                                                                      |
|       |                                                          | $\sim$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                            |
|       | · .                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                            |
| Dat   | е                                                        | SEP 0 9 1992 BV                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | humm de                                                                                                                                                                                    |
| Dat   | e                                                        | SEP 0 9 1992 By Nu                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | clear Materials Saféty Branch                                                                                                                                                              |
| Dat   | e                                                        | SEP 0 9 1992<br>By Nu<br>Be<br>CIAL RECORD COPY ME 10 Ki                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | clear Materials Saféty Branch<br>gion I<br>ng of Prussia, Pennsylvania 19406                                                                                                               |



DEPARTMENT OF THE ARM WALTER REED ARMY MEDICAL CENTER WASHINGTON, DC 20307-5001

MS16



REPLY TO ATTENTION OF:

September 9, 1993

#### Health Physics Office

Additional Information for Review of Renewal of U.S. SUBJECT: Nuclear Regulatory Commission License No. 08-01738-02, mail control No. 117725

Nuclear Materials Safety Branch Division of Radiation Safety and Safequards ATTENTION: Mr. Thomas K. Thompson U.S. Nuclear Regulatory Commission, Region I 475 Allendale Road King of Prussia, Pennsylvania 19406-1415

Information in this record was deleted in accordance with the Freedom of Information Act, exemptions 2

-11A. 2006-07

Dear Mr. Thompson:

In response to your letter of August 11, 1993, pertaining to the renewal of License No. 08-0738-02, Control No. 117725, the following additional information is provided:

a. The Radiation Control Committee (RCC) follows the criteria set down in 10 CFR 33.15 for evaluating physicians and other individuals to use radioactive material for nonhuman uses. After evaluations have been completed using the aforementioned criteria and additional information, the RCC makes a final decision to approve or disapprove an individual as an authorized user.

b. Information Notice 90-09 has been carefully reviewed. It does not state that license renewals not having an Interim Waste Storage Plan will have a condition placed on it which will only allow storage of LLW for a rolling two year period. It does state however, that "not all licensees who will need to store LLW onsite will need amendments to their licenses to do so". Our existing license has no condition limiting storage of radioactive material or waste, except by total activity. We intend to maintain our total inventory, to include storage of waste, below existing A rolling two year LLW storage condition will conflict limits. with our NRC approval for decay, in storage of materials with halflives of up to 90 days. This requires us to hold some waste for a minimum of 2.5 years with no upper limit specified. Our waste is processed and stored in a decommissioned research reactor building which is solely occupied and secured by the Health Physics Office. The waste consist of dry, solid lab material, which is compacted into 55-gallon steel drums properly labeled and ready for disposal. It is stored under dry, temperature controlled conditions on fourlevel warehouse racks, and secured in a locked building surrounded by a locked perimeter fence. This facility has capacity to safely hold 500 drums.

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|-----------|--------------|--------|----------|-----------|
| ÷         | ML050000 406 |        | MM/6 SEP | 1 7, 1993 |

c. Our request for a case by case exemption from the requirements of 10 CFR 35 Subpart J is hereby withdrawn.

d. Radiation safety office audits of the performance of radioactive material authorizations are conducted semiannually. The elements of each audit include compliance with Army and hospital regulations, terms and conditions of the NRC license, proper posting of signs and labels, activity on hand, location, inventory records, logs, procedures, and required personnel actions.

e. All protocols for the use of unbound radioactive iodine involve less than 10 mCi per experiment; however, iodination procedures are required to be performed in a designated glove box which is inside a chemical fume hood. Exhaust is pulled through a charcoal filter and HEPA filter before venting to the outside. The hood exhaust air and room air are periodically monitored to ensure compliance with federal standards. All nonhuman use labs use less than 100 mCi at any one time. Nuclear Medicine is the only location where quantities greater than 100 mCi are handled. One compactor is used at the Health Physics waste processing facility to compact dry, solid LLW in 55-gallon drums. The facility is secured by the Health Physics Office and routinely surveyed for The compactor is exhausted through a HEPA contamination. particulate filter and charcoal cartridge air samples are used to monitor the exhaust air for volatile gases.

f. The model training program that was published in Appendix A to Regulatory Guide 10.8 Revision 2 will be established for all radiation workers. Records will be maintained to demonstrate compliance with applicable regulations.

g. Animal holding facilities are maintained in clean areas. Animals are taken from the holding facility to a restricted area by authorized users for the introduction of radioactive material. Animals are then sacrificed, placed in a marked freezer, and picked up by Health Physics Office for appropriate disposal. Protocols requiring the holding of animals containing radioactive material greater than exempt quantities will include provisions to ensure that the holding facility is secured from unauthorized access. Only authorized users will handle animals, animal wastes and carcasses. Cages will be cleaned and decontaminated by authorized users to ensure proper disposal of radioactive material and that they are free of radioactive contamination.

h. Trigger levels for removable contamination will be >50% and >100% of Reg Guide 8.23, Table 2 limits. Trigger levels for radiation levels will be 2 times background or 1 mR/hr for gamma and 2 mR/hr or 25% of 10 CFR 20.101(a) limits.

i. Our request for authorization to decay in storage I-125 LLW for 5 half-lives rather than 10 half-lives is hereby withdrawn.

j. Amendment No. 63, dated June 22, 1993, added the Gillette building to our license. See enclosure.

k. It has been noted that M.1 and M.2 of Reg Guide 10.8, Revision 2 are missing some required information.

1. Minimum requirements for surveys in non-medical use areas will be determined by types and quantity of material. For gamma and high energy beta emitting material the users will survey daily with G-M survey meters. Health Physics will survey weekly when  $\geq 200$  uCi is used at any one time and monthly when <200 uCi is used. For soft beta emitting material the users will perform daily wipes at the end of each day of use when using >100 uCi at any one time. Health Physics will survey weekly when  $\geq 200$  uCi is used at any one time and monthly when <200 uCi is used.

I hope the above information adequately addresses your concerns pertaining to the renewal of our broad scope license. Please contact the undersigned at (301) 427-5161 if further information is required.

Enclosure as ARTHUR G. SAMILJAN Lieutenant Colonel, U.S. Army Chief, Health Physics Office

## U.S. NUCLEAR REGULATORY COMMISSION

MATERIALS LICENSE

Amendment No. 63

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tuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974 (Public Law 93-438), and Till de of Federal Regulations, Chapter I, Parts 30, 31, 32, 33, 34, 35, 39, 40 and 70, and in reliance on statements and representations hereit made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess, and transfer byproduct, source, and si nuclear material designated below; to use such material for the purpose(s) and at the place(s) designated below; to deliver or transfer such mato persons authorized to receive it in accordance with the regulations of the applicable Part(s). This license shall be deemed to contain the cond specified in Section 183 of the Atomic Energy Act of 1954, as amended, and is subject to all applicable rules, regulations and orders of the Nt Regulatory Commission now or hereafter in effect and to any conditions specified below.

| L                                                                                            | ·                                                 | T                                                                                                                                         | ·                                                                                   |                                          |   |                    |                           |
|----------------------------------------------------------------------------------------------|---------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------|---|--------------------|---------------------------|
| Licensee<br><sup>1</sup> . Department of the Army<br>Walter Reed Army Medical Center (WRAMC) |                                                   | In accordance with the letter dated<br>March 26, 1993,<br>3. License number 08-01738-02 is amended in<br>its entirety to read as follows: |                                                                                     |                                          |   |                    |                           |
|                                                                                              |                                                   |                                                                                                                                           |                                                                                     | <sup>2</sup> Washington, D.C. 20307-5001 |   |                    |                           |
|                                                                                              |                                                   |                                                                                                                                           |                                                                                     |                                          | : | 4. Expiration date | April 30, 1993 (Extended) |
| •                                                                                            |                                                   | S. Docket or<br>Reference No.                                                                                                             | 030-01317                                                                           |                                          |   |                    |                           |
| <ol> <li>Byproduct, source, and/or<br/>special nuclear material</li> </ol>                   | 7. Chemical and form                              | l/or physical                                                                                                                             | 8. Maximum amount that license<br>may possess at any one time<br>under this license |                                          |   |                    |                           |
| A. Any byproduct material with<br>atomic numbers 1-83                                        | A. Any                                            | •                                                                                                                                         | A. 400 millicuries of e<br>radionuclide with a<br>possession limit of ;<br>curies   |                                          |   |                    |                           |
| B. Iodine 131<br>C. Xenon 133                                                                | B. Any<br>C. Any                                  |                                                                                                                                           | B. 2 curies<br>C. 2 curies                                                          |                                          |   |                    |                           |
| D. Krypton 85                                                                                | D. Any                                            |                                                                                                                                           | D. I curiè                                                                          |                                          |   |                    |                           |
| E. Gold 198                                                                                  | E. Any                                            |                                                                                                                                           | E. 1 curie                                                                          |                                          |   |                    |                           |
| F. Phosphorus 32                                                                             | F. Any                                            |                                                                                                                                           | F. 2 curies                                                                         |                                          |   |                    |                           |
| G. Carbon 14                                                                                 | G. Any                                            |                                                                                                                                           | <b>G. 2</b> curies                                                                  |                                          |   |                    |                           |
| H. Iodine 125                                                                                | H. Any                                            | ·                                                                                                                                         | H. 1 curia                                                                          |                                          |   |                    |                           |
| I. Iridium 192                                                                               | I. Any                                            |                                                                                                                                           | I                                                                                   |                                          |   |                    |                           |
| J. Chromium 51                                                                               | J. Any                                            |                                                                                                                                           | J. 750 millicuries                                                                  |                                          |   |                    |                           |
| K. Sulfùr 35                                                                                 | K. Any                                            |                                                                                                                                           | K. I curie                                                                          |                                          |   |                    |                           |
| L. Hydrogen 3                                                                                | L. Any                                            |                                                                                                                                           | L. 5 curies                                                                         |                                          |   |                    |                           |
| M. Molybdenum 99                                                                             | M. Molybden<br>Techneti<br>Generator              | um 99/                                                                                                                                    | M. 23 curies                                                                        |                                          |   |                    |                           |
| N. Technetium 99m                                                                            | N. Any                                            |                                                                                                                                           | N23 curies 🚬                                                                        |                                          |   |                    |                           |
| 0. Strontium 90                                                                              | 0. Sealed se                                      | ources                                                                                                                                    | 0.                                                                                  |                                          |   |                    |                           |
| P. Cesium 137                                                                                | P. Sealed so                                      | ources                                                                                                                                    | P.                                                                                  |                                          |   |                    |                           |
| Q. Gadolinium 153                                                                            | Q. Sealed so                                      | ources                                                                                                                                    | Q.                                                                                  |                                          |   |                    |                           |
| K. 1001ne 125                                                                                | Norland<br>Model 17                               | Inst. Co.,<br>8A591A)                                                                                                                     | R. 400 INTERCUTIES                                                                  |                                          |   |                    |                           |
| S. Iodine 125                                                                                | S. Sealed so<br>(3M Compa                         | ources<br>any seeds)                                                                                                                      | S. 500 millicuries                                                                  |                                          |   |                    |                           |
| T. Iodine 125                                                                                | T. Sealed so<br>(AECL Moo<br>C324, or<br>Model IM | ources<br>dels C235 or<br>Amersham Corp.<br>C.P2)                                                                                         | T. 4 sources, not to exc<br>300 millicuries each                                    |                                          |   |                    |                           |
|                                                                                              | Ex c                                              | 2                                                                                                                                         |                                                                                     |                                          |   |                    |                           |
| S74A U.S. NUCLE                                                                                                                                                                                                                         | AR REGULATORY COMMISSION                                                                                                                                                                          | License number                                                                                                  | PAGE                                                                                      | <u>2 OF</u>                                                                   | 4!                             |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|--------------------------------|
| MATERIALS LICE                                                                                                                                                                                                                          | ENSE                                                                                                                                                                                              | Docket or Refer                                                                                                 | 08-01<br>ence number                                                                      | 738-02                                                                        |                                |
| SUPPLEMENTARY S                                                                                                                                                                                                                         | HEEI                                                                                                                                                                                              | ·                                                                                                               |                                                                                           | 01317                                                                         |                                |
|                                                                                                                                                                                                                                         |                                                                                                                                                                                                   |                                                                                                                 | Ameno                                                                                     | iment No.                                                                     | 63                             |
| (Items 6., 7. & 8. continued)                                                                                                                                                                                                           |                                                                                                                                                                                                   |                                                                                                                 |                                                                                           |                                                                               |                                |
| 6. Byproduct, source, and/or<br>special nuclear material                                                                                                                                                                                | 7. Chemical and/or<br>form                                                                                                                                                                        | physical                                                                                                        | 8. Maxim<br>licer<br>any (<br>licer                                                       | num amoun<br>Isee may<br>Dhe time<br>Ise                                      | t that<br>posses<br>under      |
| U. Cesium 137<br>V. Cobalt 60<br>W. Americium 241<br>X. Americium 241                                                                                                                                                                   | U. Sealed sources<br>V. Sealed sources<br>W. Any<br>X. Sealed sources                                                                                                                             | *                                                                                                               | U.<br>V.<br>W. <u>100</u> ,<br>X.                                                         | nicrocuri                                                                     | es                             |
| Y. Nickel 63<br>Z. Iodine 129<br>AA. Thorium<br>BB. Uranium<br>CC. Uranium depleted in                                                                                                                                                  | Y. Sealed sources a<br>Z. Sealed sources<br>AA. Any<br>BB. Any<br>CC. Plated Metal                                                                                                                | and foils                                                                                                       | Y. 1 cu<br>Z. 1 cu<br>AA. 5 k<br>BB. 50 (<br>CC. 400                                      | rie<br>rie<br>llograms<br>kilograms<br>kilogram                               | S                              |
| DD. Americium 241<br>EE. Cesium 137                                                                                                                                                                                                     | DD. Sealed sources<br>EE. Sealed source                                                                                                                                                           |                                                                                                                 | DD.<br>EE.                                                                                | · _ ·                                                                         |                                |
| FF. Cesium 137                                                                                                                                                                                                                          | FF. Sealed sources                                                                                                                                                                                | s di                                                                                                            | <b>FF.</b> \                                                                              |                                                                               | Ţ                              |
| 9. Authorized use                                                                                                                                                                                                                       |                                                                                                                                                                                                   | • • •                                                                                                           | <u></u>                                                                                   |                                                                               |                                |
| A. through T. Medical research<br>as defined in 10<br>U. through Z. Research and de<br>AA. and BB. Teaching and lat<br>CC. Shielding.<br>DD. Standards and reference so<br>EE. In an<br>instruments.<br>FF. Instrument calibration.     | h, diagnosis, and the<br>O CFR 30.4.<br>velopment as defined<br>boratory research.<br>ources.                                                                                                     | rapy; resea<br>in 10 CFR 3                                                                                      | irch and (<br>10.4; tea<br>for calib                                                      | developme<br>ching.<br>ration of                                              | nt                             |
| ······································                                                                                                                                                                                                  | CONDITIONS                                                                                                                                                                                        |                                                                                                                 |                                                                                           |                                                                               |                                |
| 10. Location of use: Walter<br>WRAMC Forest Glen Section<br>Institute of Research Anim<br>Medical Laboratory, WRAMC<br>and U.S. Army Institute o<br>Rickman Building, 13 Taft<br>9620 Medical Center Drive<br>Center, 1413 Research Bou | Reed Army Medical Cen<br>and Annex, Silver Sp<br>mal Holding Facility,<br>Department of Pathol<br>f Dental Research Fac<br>Court, Rockville, Ma<br>, Rockville, Maryland<br>levard, Rockville, Ma | ter, Washin<br>ring, Maryl<br>Fort Meade<br>ogy, Fort M<br>ility, Fort<br>ryland; Key<br>; and Gille<br>ryland. | igton, D.<br>and; Wali<br>eade, Marylau<br>leade, Mar<br>Meade, I<br>West Re<br>atte Buil | C.;<br>ter Reed<br>nd; U.S.<br>ryland;<br>Maryland;<br>search Ce<br>ding, 270 | Army<br>Army<br>nter,<br>Resea |
| 1                                                                                                                                                                                                                                       |                                                                                                                                                                                                   | <b>.</b>                                                                                                        |                                                                                           |                                                                               |                                |
| 11. Radiation Safety Officer:                                                                                                                                                                                                           | LTC Arthur G. Samil                                                                                                                                                                               | jan.                                                                                                            |                                                                                           |                                                                               |                                |

|       | 14A U.S. NUCLEAR REGULATORY COM                                                                                                                                                                                                                                                          | AISSION PAGE 3 OF 4 PAGES                                                                                                                                                                                                                                 |
|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|       |                                                                                                                                                                                                                                                                                          | License number                                                                                                                                                                                                                                            |
|       | MATERIALS LICENSE                                                                                                                                                                                                                                                                        | Docket or Reference number                                                                                                                                                                                                                                |
|       | SUFFLEMENTANT SHEET                                                                                                                                                                                                                                                                      | 030-01317                                                                                                                                                                                                                                                 |
|       |                                                                                                                                                                                                                                                                                          | Amendment No. 63                                                                                                                                                                                                                                          |
|       |                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                           |
| (Cont | tinued) CONDITIONS                                                                                                                                                                                                                                                                       | . · · ·                                                                                                                                                                                                                                                   |
| 12.   | A. Licensed material shall be used by, o<br>designated by the licensee's Radiatio<br>Chairman.                                                                                                                                                                                           | or under the supervision of, individuals<br>on Safety Committee, Col. Joan T. Zajtchuk,                                                                                                                                                                   |
|       | B. The use of licensed material in or on<br>in Section 35.2 of 10 CFR Part 35.                                                                                                                                                                                                           | n humans shall be by a physician as defined                                                                                                                                                                                                               |
|       | C. Physicians designated to use licensed training criteria established in 10 (                                                                                                                                                                                                           | d material in or on humans shall meet the<br>CFR Part 35, Subpart J.                                                                                                                                                                                      |
| 13.   | Experimental animals administered licensed used for human consumption.                                                                                                                                                                                                                   | d materials or their products shall not be                                                                                                                                                                                                                |
| 14.   | In lieu of using the conventional radiation<br>yellow background) as provided in Section<br>licensee is hereby authorized to label de<br>licensed material and used in gas chromate<br>or stamped radiation caution symbols with                                                         | on caution colors (magenta or purple on<br>20.203(a)(1), of 10 CFR Part 20, the<br>tector cells and cell baths, containing<br>ography devices, with conspicuously etched<br>out a color requirement.                                                      |
| 15.   | Detector cells containing a titanium trit<br>only be used in conjunction with a proper<br>which prevents foil temperatures from exc                                                                                                                                                      | ide foil or a scandium tritide foil shall<br>ly operating temperature control mechanism<br>eeding that specified by the manufacturer.                                                                                                                     |
| 16.   | Notwithstanding the requirements of 10 CFI<br>for medical use any byproduct material or<br>Administration has accepted a "Notice of (<br>Drug" (IND).                                                                                                                                    | R 35.49 (a) and (b), the licensee may use<br>reagent kit for which the Food and Drug<br>Claimed Investigational Exemption for a New                                                                                                                       |
| 17.   | The licensee may transport licensed mater<br>10 CFR 71, "Packaging and Transportation (                                                                                                                                                                                                  | ial in accordance with the provisions of<br>of Radioactive Material."                                                                                                                                                                                     |
| 18.   | If only a single radionuclide specified in<br>limit is the quantity specified in <u>Schedu</u><br>0767. If two or more radionuclides are po<br>determined as follows: the sum of the qu<br>by the quantities of those radionuclides<br><u>Possession Limits</u> , NUREG-0767 shall not e | n NUREG 0767, is possessed, the possession<br>le of Limiting Possession Limits, NUREG-<br>ossessed, the possession limit for each is<br>otients of the quantities possessed divide<br>specified in the <u>Schedule</u> of <u>Limiting</u><br>xceed unity. |
|       | The licensee is authorized to hold radioa                                                                                                                                                                                                                                                | ctive material with a physical half-life o<br>fore disposal in ordinary trash provided:                                                                                                                                                                   |
| 19.   | less than 90 days for decay-in-storage be                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                           |
| 19.   | <ul> <li>less than 90 days for decay-in-storage be</li> <li>A. Radioactive waste to be disposed of minimum of 10 half-lives.</li> </ul>                                                                                                                                                  | in this manner shall be held for decay a                                                                                                                                                                                                                  |
| 19.   | <pre>less than 90 days for decay-in-storage be A. Radioactive waste to be disposed of minimum of 10 half-lives.</pre>                                                                                                                                                                    | in this manner shall be held for decay a                                                                                                                                                                                                                  |
| 19.   | <pre>less than 90 days for decay-in-storage be A. Radioactive waste to be disposed of   minimum of 10 half-lives.</pre>                                                                                                                                                                  | in this manner shall be held for decay a                                                                                                                                                                                                                  |
| 19.   | <pre>less than 90 days for decay-in-storage be A. Radioactive waste to be disposed of   minimum of 10 half-lives.</pre>                                                                                                                                                                  | in this manner shall be held for decay a                                                                                                                                                                                                                  |

| MATERIALS LICENSE                     | D8-01738-02                   |  |  |  |  |
|---------------------------------------|-------------------------------|--|--|--|--|
| SUPPLEMENTARY SHEET                   | Docket or Reference number    |  |  |  |  |
| · · · · · · · · · · · · · · · · · · · | 030-01317<br>Amendment No. 63 |  |  |  |  |

- B. Before disposal as normal waste, radioactive waste shall be surveyed to determine that its radioactivity cannot be distinguished from background. All radiation labels shall be removed or obliterated.
- C. Generator columns shall be segregated so that they may be monitored separately to ensure decay to background levels prior to disposal.

Except as specifically provided otherwise in this license, the licensee shall conduct its program in accordance with the statements, representations, and procedures contained in the documents, including any enclosures, listed below. The Nuclear Regulatory Commission's regulations shall govern unless the statements, representations and procedures in the licensee's application and correspondence are more restrictive than the regulations.

| Α. | Application dated July 18, 1979  |
|----|----------------------------------|
| B. | Letter dated January 13, 1984    |
| С. | Letter dated May 8, 1987         |
| D. | Letter dated March 16, 1988      |
| Ε. | Letter dated March 28, 1988      |
| F. | Application dated August 5, 1988 |
| G. | Letter dated September 23, 1988  |
| Η. | Letter dated July 28, 1989       |
| Ι. | Letter dated September 12, 1989  |
| J. | Letter dated January 19, 1990    |
| κ. | Letter dated July 16, 1990       |
| L. | Letter dated March 15, 1991      |
| Μ. | Letter dated July 11, 1991       |
| Ν. | Letter dated April 8, 1992       |
| 0. | Letter dated August 4, 1992      |
| Ρ. | Letter dated November 24, 1992   |
| 0. | Letter dated March 26. 1993      |

For the U.S. Nuclear Regulatory Commission

Bv

Nuclear Materials Safety Branch Region I King of Prussia, Pennsylvania 19406

te JUN 2 2 1993



DEPARTMENT OF THE ARMY WALTER REED ARMY MEDICAL CENTER WASHINGTON, DC 20307-5001



REPLY TO ATTENTION OF:

October 29, 1993

Health Physics Office

SUBJECT: Additional Information for Review of Renewal of U.S. Nuclear Regulatory Commission License No. 08-01738-02, mail control No. 117725

Nuclear Materials Safety Branch Division of Radiation Safety and Safeguards ATTENTION: Mr. Thomas K. Thompson U.S. Nuclear Regulatory Commission, Region I 475 Allendale Road King of Prussia, Pennsylvania 19406-1415

Information in this record was deleted in accordance with the Freedom of Information Act. exemptions

FOIA 2006-023

Dear Mr. Thompson:

In response to your letter of September 29, 1993, pertaining to the renewal of License No. 08-0738-02, Control No. 117725, the following additional information is provided:

1. The minimum requested information that is required of proposed users is detailed on the enclosed authorization application forms. (Enclosures 1-3)

2. The information indicated in Information Notice 90-09, Attachment 1 is provided at enclosure 4.

3. The minimum elements of our authorization audits are detailed in the Health Physics Office Standing Operating Procedure 1-26. (Enclosure 5) Performance of independent surveys was addressed in paragraph 1 of our September 9, 1993 letter.

4. The minimum information recorded for radiation safety training is date training was given, place, instructor, and names of attendees. The groups of workers who will receive training are listed at ATT 8.1 of original application.

5. Please change Item 10.2 of original application to read "We will establish and implement the model ALARA program in Appendix G to Regulatory Guide 10.8, Revision 2 except that paragraph 3.a.(3) is deleted".

6. Please change Item 10.5 of original application to read "We will establish and implement the model spill procedures in Appendix J to Regulatory Guide 10.8, Revision 2 except that the Alternate RSO will follow up on the cleanup of the spill and will attach an Incident Memorandum to the Contamination Survey.

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I hope you will find the above information sufficient to complete your processing of our application.

Enclosures as

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ARTHUR G. SAMILJAN Lieutenant Colonel, U.S. Army Chief, Health Physics Office



#### INSTRUCTIONS FOR PREPARATION OF APPLICATION FOR AUTHORIZATION TO USE RADIOACTIVE MATERIAL (NON-HUMAN USE)

#### WRAMC FORM 1662R (FEBRUARY 1979)

#### GENERAL INFORMATION

An applicant for an "Authorization to Use Radioactive Material (Non-Human Use)" should camplete WRAMC Form 1662R in detail and submit in duplicate to the WRAMC Health Physics Office.

Application for gamma irradiators should include a copy of the proposed Standard Operating Procedures that will mainmented to assure personnal safety during routing description and safetyaacy situations. be implemented to assure personnel safety during routine of

3. All proposed locations where the applicant desires to use, store, or dispose of radioactive material should be coordinated with the Health Physics Office Reactor and Survey Branch prior to submission of the application in order to assure aspeditious processing of the application. Submission of an incomplete application will often result in a delay in issuence of an authorization because of the correspondence necessary to obtain information requested on the 3. application.

#### EXPLANATION OF WRAMC FORM 1662R (FEBRUARY 1979)

1. WRAMC Form 1662R is designed for use in supplying information on radioactive materials use programs of varying complexity. The applicant should provide complete information on his proposed program for the possession and use of radioactive material for those items that do not apply, indicate as N/A (not applicable).

2. Application for new authorizations and renewal af existing authorizations should be completed in their entirety. However, applications for amendment of existing authorizations may be completed as follows:

a. Complete Items 1, 2, 3, 11, and 12.

For those items to do not required amendment indicate as N/C (no change).
 For those items that require amendment indicate the proposed changes to the current authorization.

3. Explanation of WRAMC Form 1662R Items:

#### 1. Self explanatory.

2. The "Principal User" is the individual who bears altimate responsibility for possession, inventory and implementation of the safety procedures necessary to assure the sale use of the materials specified in the application. He is directly responsible to the WRAMC Radiation Control Committee. Attach a completed WRAMC Form 1643 if a current copy is not on file with the Health Physics Office,

3. The applicant's address should include organization, activity, building, room number, and reference or affice symbol.

4. A "Co-Worker" is an individual who possesses adequate training and experience with radioactive material to qualify him as a "Principal User". He works under the direction of and is responsible to the "Principal User for the safe and proper use of the materials specified in the application. List all Co-Workers alphabetically by last name. Each Co-Worker should be identified as follows: Last name, lirst name, middle initial and grade. Attach a completed WRAMC Form 1643 for each Co-Worker if a current copy is not an tile with the Health Physics Office.

5. A "Trainee" is an individual who works under the direct supervision of a Principal User or Co-Worker for the purpose of obtaining the necessary training and experience to qualify for either status. List all trainees alphaberic-ally by last nome. Each Trainee should be identified as follows: Last name, first nome, middle initial and grade.

6. A "Technician" is an individual who works under the direct supervision of a Principal User or Co-Worker for the purpose of performing certain routine duties associated with use of materials specified in the application. He does not prossess suitable training and experience to be classified as a Principal User or Co-Worker, and is not undergoing training that would qualify him to attain either status. List all Technicians alphabetically by last nome. Each Technician should be identified as follows: Last name, first name, middle initial and grade.

#### 7-9. Self explanatory.

100. List radioisotopes by escending mass number, i.e., the isotope with the smallest mass number is placed at the top of the column and the isotope with the greatest mass number is placed at the bottom of the column.

10b. In addition to the chemical form of the radioisotope indicate whether it is in solid or liquid or gaseous form and whether it is a sealed or unsealed source. In order for radioactive material to qualify as a "sealed source" the radioactive source must be sealed in an impervious container which has sufficient mechanical strength to prevent contact with and dispersion of the radioactive material under the conditions of use and weat for which is was designed.

10c. State the maximum millicutie amount of each chemical form of the radioisatope that must be kept in the inventory in order to satisfy mission requirements.

10b. State the intended use of each chemical form of the radioisatapes listed in Calumn Da.

11-12. Salf explanatory.

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| <br><br>F1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 5. TRAI<br>ELD OF TRAINING<br>A                                                                                                                                              | NING RECI                              | EIVED IN BASIS RADIOI<br>LOCATION AND DA<br>(Include cours | SOTOPE HANDLING TE<br>ATE(S) OF TRAINING<br>is title if known)<br>B | CXNIQUES<br>TYPE<br>LEC<br>LABO<br>COL<br>(H | AND LENG<br>TURE/<br>RATORY<br>JRSES<br>ours)<br>C         | STH OF TRAININ<br>SUPERVISED<br>LABORATORY<br>EXPERIENCE<br>(Hours)<br>D |
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| ,<br>FI<br>G. RADIATI<br>INSTRUA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 5. TRAI<br>ELD OF TRAINING<br>A<br>ION PHYSICS AND<br>ION PHYSICS AND                                                                                                        | NING RECI                              | EIVED IN BASIS RADIOI                                      | SOTOPE HANDLING TE<br>ATE(S) OF TRAINING<br>Te title if known)<br>B | CHNIQUES<br>TYPE<br>LEC<br>LABO<br>COL<br>(H | AND LENC<br>TURE/<br>RATORY<br>JRSES<br><i>ours</i> )<br>C | STH OF TRAININ<br>SUPERVISED<br>LABORATORY<br>EXPERIENCE<br>(Hours)<br>D |
| FI<br>G. RADIAT<br>INSTRUA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 5. TRAI<br>ELD OF TRAINING<br>A<br>ION PHYSICS AND<br>ION TATION                                                                                                             | NING RECI                              | EIVED IN BASIS RADIOI                                      | SOTOPE HANDLING TE<br>ATE(S) OF TRAINING<br>is title if known)<br>B | CHNIQUES<br>TYPE<br>LEC<br>LABO<br>(H        | AND LENG<br>TURE/<br>RATORY<br>JRSES<br><i>auss</i> )<br>C | TH OF TRAININ<br>SUPERVISED<br>LABORATORY<br>EXPERIENCE<br>(Hours)<br>D  |
| G. RADIATI<br>INSTRUA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 5. TRAI<br>ELD OF TRAINING<br>A<br>ION PHYSICS AND<br>ION PROTECTION                                                                                                         | NING RECI                              | EIVED IN BASIS RADIOI                                      | SOTOPE HANDLING TE<br>ATE(S) OF TRAINING<br>re title if known)<br>B | CHNIQUES<br>TYPE<br>LEC<br>LABO<br>COL<br>(H | AND LENG<br>TURE/<br>RATORY<br>JRSES<br>ours)<br>C         | TH OF TRAININ<br>SUPERVISED<br>LABORATORY<br>EXPERIENCE<br>(Hours)<br>D  |
| G. RADIAT<br>INSTRUM<br>b. RADIAT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 5. TRAI<br>ELD OF TRAINING<br>A<br>ION PHYSICS AND<br>ION PROTECTION                                                                                                         | NING RECI                              | EIVED IN BASIS RADIOI                                      | SOTOPE HANDLING TE<br>ATE(S) OF TRAINING<br>is title if known)<br>B | CXNIQUES<br>TYPE<br>LEC<br>LABO<br>COL<br>(H | AND LENG<br>TURE/<br>RATORY<br>JRSES<br>ours)<br>C         | STH OF TRAININ<br>SUPERVISED<br>LABORATORY<br>EXPERIENCE<br>(Hours)<br>D |
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| <ul> <li>FI</li> <li>a. RADIATI<br/>INSTRUA</li> <li>b. RADIAT</li> <li>b. RADIAT</li> <li>c. MATHEN<br/>THE US<br/>OF RAD</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 5. TRAI<br>ELD OF TRAINING<br>A<br>ION PHYSICS AND<br>ION PROTECTION<br>ION PROTECTION<br>MATICS PERTAINING TO<br>E AND MEASUREMENT<br>IOACTIVITY                            |                                        | EIVED IN BASIS RADIOI                                      | SOTOPE HANDLING TE<br>ATE(S) OF TRAINING<br>is title if known)<br>B |                                              | AND LENG<br>TURE/<br>RATORY<br>JRSES<br><i>aurs</i> )<br>C | TH OF TRAININ<br>SUPERVISED<br>LABORATORY<br>EXPERIENCE<br>(Hours)<br>D  |
| 4. RADIAT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 5. TRAI<br>ELD OF TRAINING<br>A<br>ION PHYSICS AND<br>NENTATION<br>ION PROTECTION<br>MATICS PERTAINING TO<br>E AND MEASUREMENT<br>IOACTIVITY                                 |                                        | EIVED IN BASIS RADIOI                                      | SOTOPE HANDLING TE<br>ATE(S) OF TRAINING<br>re title if known)<br>B |                                              | AND LENG<br>TURE/<br>RATORY<br>JRSES<br>ours)<br>C         | TH OF TRAININ<br>SUPERVISED<br>LABORATORY<br>EXPERIENCE<br>(Hours)<br>D  |
| <ul> <li>FI</li> <li>a. RADIATI<br/>INSTRUM</li> <li>b. RADIAT</li> <li>b. RADIAT</li> <li>c. MATHEM<br/>THE USI<br/>OF RAD</li> <li>d. RADIAT</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 5. TRAI<br>ELD OF TRAINING<br>A<br>ION PHYSICS AND<br>ION PROTECTION<br>ION PROTECTION<br>MATICS PERTAINING TO<br>E AND MEASUREMENT<br>IOACTIVITY<br>ION BIOLOGY             |                                        | EIVED IN BASIS RADIOI                                      | SOTOPE HANDLING TE<br>ATE(S) OF TRAINING<br>or title if known)<br>B |                                              | AND LENG<br>TURE/<br>RATORY<br>JRSES<br><i>aws</i> )<br>C  | TH OF TRAININ<br>SUPERVISED<br>LABORATORY<br>EXPERIENCE<br>(Hours)<br>D  |
| C. RADIAT<br>INSTRUM  C. MATHEN  C | 5. TRAI<br>ELD OF TRAINING<br>A<br>ION PHYSICS AND<br>NENTATION<br>ION PROTECTION<br>MATICS PERTAINING TO<br>E AND MEASUREMENT<br>IOACTIVITY<br>ION BIOLOGY<br>HARMACEUTICAL | NING RECI                              | EIVED IN BASIS RADIOI                                      | SOTOPE HANDLING TE<br>ATE(S) OF TRAINING<br>is title if knownJ<br>B |                                              | AND LENG<br>TURE/<br>RATORY<br>JRSES<br><i>ours</i> )<br>C | TH OF TRAININ<br>SUPERVISED<br>LABORATORY<br>EXPERIENCE<br>(Hours)<br>D  |

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| 1           |                            | 6. EXPERIEN                | CE WITH RADIATION (Actual use of Radiois      | solopes) (Sealed or unserted source)  |                                                                                                                  |
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| [           | ISOTOPE                    | MAXIMUM AMOUNT             | WHERE EXPERIENCE WAS GAINED                   | DURATION OF EXPERIENCE                | TRE IP USE                                                                                                       |
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|             |                            | 7. FYPE                    |                                               | )<br>VICES (X-ray, Irradiators, etc.) | <u>1</u>                                                                                                         |
|             |                            | DEVICE                     |                                               | DUBATION OF EXPERIENCE                |                                                                                                                  |
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| •           | 177 · · ·                  | ICATION                    |                                               |                                       |                                                                                                                  |
| •<br>•<br>• | 8. CERTIF                  |                            | hereon is true and complete to the best of my | i induladge:                          | ·                                                                                                                |
| •           | 8. CERTIF                  | t the Information provided |                                               |                                       | · · ·                                                                                                            |
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| •     | Drincinal Hear                         | h Telephone Nu  | mber     | ~          | Authorization Number                        |
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| •     | Coworkers                              | e. Trainees     | •.       | f.         | Technicians                                 |
|       |                                        |                 |          |            |                                             |
| •     | Radioisotope(s)                        | h. Physical/Ch  | emical F | orm        | i. Maximum Quantity per<br>Experiment (mCi) |
| •     | Title of Projec                        | t               |          | <u></u>    |                                             |
| •     | Beginning Date                         | 1. Ending Date  |          | m.         | Repetitive Study                            |
|       |                                        |                 |          |            | Yes 🗌 No 🗌                                  |
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| Charlest                                                                                                                                                                                                                                                                                                                                                     | · · · · ·                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Room.                                                                                                                                                    | Blda.                                                                                                                                              | ÷.,                                                                                                                                         |
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| Disposition of animals                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                          | Drug.                                                                                                                                              |                                                                                                                                             |
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| q. Isotope Utilization                                                                                                                                                                                                                                                                                                                                       | Locations:                                                                                                                                                                                   | (2)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | (3)                                                                                                                                                      | ( 4 )                                                                                                                                              | (5)                                                                                                                                         |
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| Building                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                          |                                                                                                                                                    |                                                                                                                                             |
| Room                                                                                                                                                                                                                                                                                                                                                         | •                                                                                                                                                                                            | ١                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                          |                                                                                                                                                    |                                                                                                                                             |
| Maximum Amount (mCi)                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                              | l                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                          |                                                                                                                                                    |                                                                                                                                             |
| r. Maximum Amount in<br>Possession (mCi)                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                              | Bldg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Room                                                                                                                                                     | Maximur                                                                                                                                            | n Amt (mCi                                                                                                                                  |
| s. Isotope Storage Loca                                                                                                                                                                                                                                                                                                                                      | ation(s)                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                          |                                                                                                                                                    |                                                                                                                                             |
| t. Waste Storage Locat:                                                                                                                                                                                                                                                                                                                                      | ion(s)                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                          |                                                                                                                                                    |                                                                                                                                             |
| u. Animal/Tissue Storad                                                                                                                                                                                                                                                                                                                                      | ge Location                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                          |                                                                                                                                                    |                                                                                                                                             |
| v. All radioactive was<br>in accordance with                                                                                                                                                                                                                                                                                                                 | te will be t<br>Health Physi                                                                                                                                                                 | ransfered<br>Lcs Condit                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | to the He<br>tion No. 4.                                                                                                                                 | ealth Physic                                                                                                                                       | cs Office                                                                                                                                   |
| Condition No. 2.                                                                                                                                                                                                                                                                                                                                             | • •                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                          | ngen neuren                                                                                                                                        |                                                                                                                                             |
| Condition No. 2.<br>x. Personnel Dosimetry<br>Condition No. 1. A<br>ticipating personne                                                                                                                                                                                                                                                                      | will be rec<br>ssigned dosi<br>l.<br>Whole B                                                                                                                                                 | quested in<br>imetry mor<br>Body                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | n accordance<br>nitors will<br>TLD I                                                                                                                     | ce with Hea<br>1 be worn b<br>Ring                                                                                                                 | lth Physic<br>y all par                                                                                                                     |
| <pre>Condition No. 2. x. Personnel Dosimetry Condition No. 1. A ticipating personne y. Are there any signi with this experimen [Toxic, Explosive, trical etc.) that m inspections, survey If yes specify:</pre>                                                                                                                                              | will be rec<br>ssigned dosi<br>1.<br>Whole E<br>ficant "NON-<br>t; (Biologic<br>Corrosive et<br>ay effect He<br>s or waste b                                                                 | quested in<br>imetry mor<br>Body<br>-RADIATION<br>cal [Aids,<br>tc.], Shan<br>ealth Physical for the second second<br>handling for the second | TLD I<br>TLD I<br>TLD I<br>v" personne<br>, etc.], Ha<br>rps, Laser<br>sics person<br>procedures                                                         | ce with Hea<br>l be worn b<br>Ring<br>el hazards<br>azardous Ch<br>s, Microwav<br>nnel during<br>NO                                                | Ith Physic<br>y all par<br>associated<br>emicals<br>es, elec-<br>routine<br>YES                                                             |
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# INFORMATION NEEDED IN AN AMENDMENT REQUEST TO AUTHORIZE EXTENDED INTERIM STORAGE OF LOW-LEVEL RADIOACTIVE WASTE IN 90-09

#### 1. Identification of Waste to be Stored:

a. None

b. H-3, 1.5 Ci; C-14, 0.2 Ci; 2,900 cubic feet in (380) 55gallon drums.

c. (1) C

(2) solid

(3) volume reduction

(4) none

d. H-3, 200 mCi/yr, solid/dry; C-14, 30 mCi/yr, solid/dry; 440 cubic feet in (60) 55-gallon drums.

e. None

2. Plans for Final Disposal:

a. July 1994 for waste generated in Washington, DC and Maryland.

b. Texas for DC waste in 1996 and the Appalachian Compact for MD waste in 2000.

c. As soon as possible after site is available; 1-3 months.

3. Physical Description of Storage Area:

a. See attachment 1.

b. 500 drums, 60 drums/year.

c. Maintained decommissioned reactor facility.

d. Perimeter fence w/secured gate and secured brick and concrete building.

e. Forced air circulation system. This system has provided adequate ventilation for our LLRW storage and processing facility for the past several years. The additional drums of solid, long waste containing H-3 and C-14 will not require modification to this system.

f. The building has an alarm system, fire extinguishers, fire hydrant, and is inspected monthly by fire chief. The additional storage will not require additional safeguard systems or modifications to the existing systems.

Cricl 4

g. The building has a heating and cooling system.

h. The building was designed and built as a reactor with low vulnerability to other hazards.

4. Packaging and Container Integrity:

a. Dry, solid waste compacted in steel, 55-gallon drums. No hazards to integrity of containers; indefinite storage life.

b. Weekly radiation and contamination surveys to include wipe samples and visual inspection.

c. Not applicable

5. Radiation Protection:

a. Area is currently used for LLRW storage and processing with proper posting, surveying, and monitoring. The extended interim storage of H-3 and C-14 will not present a significant radiation hazard nor a significant increase in personnel exposure. The current radiation safety and ALARA programs as described in the license application are adequate for this additional storage of H-3 and C-14.

b. none

c. The Walter Reed Army Medical Center (WRAMC) Emergency Preparedness Plan is activated by dialing (202) 576-3317. This is a central notification number for WRAMC police, fire, and emergency response. The extent of activation will be dependent upon the particular situation. The extended interim storage of H-3 and C-14 will not present significant hazards or risks.

d. The radionuclides requiring extended interim storage are H-3 and C-14. The activity of the radionuclides contained in each waste package received is recorded in a log as a drum is packed. When the drum is filled and sealed the total quantity of each radionuclide is recorded on the drum's identification label. This information is also recorded and maintained on an electronic data file.

6. Training:

a. Health physics technicians attend weekly, one hour professional training classes which cover all aspects of the radiation safety program. Health Physics Office standing operating procedures are reviewed and discussed in detail as part of the training program.

7. Financial Assurance: See attached Statement of Intent.

8. Emergency Preparedness: Not required; however, WRAMC has an Emergency Preparedness Plan.



DEPARTMENT OF THE ARMY WALTER REED ARMY MEDICAL CENTER WASHINGTON, DC 20307-5001



REPLY TO ATTENTION OF:

Office of The Commanding General

# STATEMENT OF INTENT

1. I, Ronald R. Blanck, Commander of Walter Reed Army Medical Center, am the Official duly appointed by the Headquarters, Department of the Army, to represent my organization.

2. The Nuclear Regulatory Commission Licenses for which this Statement of Intent is being issued are:

(a) License Number 08-01738-02 (expiration date 30 Apr 93)

(b) License Number 08-01738-03 (expiration date 30 Nov 96)

3. The facilities for which this Statement of Intent is being issued are:

(a) Walter Reed Army Medical Center, Washington, District of Columbia;

(b) Walter Reed Army Medical Center, Forest Glen Section and Annex, Silver Springs, Maryland;

(c) Walter Reed Army Medical Center, Department of Pathology, Fort Meade, Maryland (U.S. Army Medical Laboratory);

(d) Walter Reed Army Institute of Research, Washington, District of Columbia;

(e) Walter Reed Army Institute of Research, Rickman Building, 13 Taft Court, Rockville, Maryland;

(f) Walter Reed Army Institute of Research, Gillette Building, 270 Research Center, 1413 Research Boulevard, Rockville, Maryland;

(g) Walter Reed Army Institute of Research Animal Holding Facility, Fort Meade, Maryland;

(h) U.S. Army Institute of Dental Research Facility, Fort Meade, Maryland;

# - 2 -

4. In accordance with the requirements of 10 CFR 30.35, and in my capacity as the Commander of Walter Reed Army Medical Center, I am providing assurance that sufficient funds for decommissioning and disposal of stored radioactive waste will be obtained when necessary for the eventual decommissioning of WRAMC's NRC Licenses and disposal of stored radioactive waste.

Ronald R. Blanck Major General, U.S. Army Commander

# HEALTH PHYSICS WALTER REED ARMY MEDICAL CENTER Washington, DC 20307-5001

October 28, 1993

HSHL-HP SOP# 1-26

# AUDIT OF RADIOACTIVE MATERIAL AUTHORIZATIONS

1. GENERAL: In accordance with AR 40-37 and 40-61, semiannual reviews of each WRAMC Radioactive Material Authorization must be performed. Site inspection of all authorized activities and work areas are reviewed in order to determine compliance with procedures, radioisotope possession limits, record keeping, and posting requirements.

2. PURPOSE: The purpose of this SOP is to:

a. Establish the review process used to audit an authorization.

b. Define the items to be audited and establish the criteria for exceptable compliance with Federal and WRAMC regulatory requirements.

c. List the documentation required.

3. REQUIRED FORMS:

a. The following forms must be used or reviewed when setting up, conducting, and/or following up on an audit of a Radioactive Material Authorization:

1. Memorandum: Health Physics Office "Audit of Radioactive Material" (Incl 1).

2. WRAMC Audit of Radioactive Material Form (Incl 2).

3. DA Form 3862: "Controlled Substances Stock Record" (Incl 3) or equivalent.

4. Authorization Program, Isotope Inventory Report Form (generated from the computer).

6. WRAMC Form 538 "Radiation Worker Briefing Card" (Incl 4).

7. Deficient Audit Form (Incl 5)

Ene 5

## HSHL-HP SOP# 1-26

October 28, 1993

#### 4. PREPARING FOR AUDIT:

(....)

a. Set up appointments with Principle Users (PU) by sending (or hand carrying) Memorandum from Health Physics Office "Audit of Radioactive Material". Audits should be scheduled in groups by location so the auditor can move from one audit to the next with a minimum of lost time. Most audits can be performed in 30 minutes, large authorizations may require more time and should be scheduled accordingly. Some rearranging will be necessary as PU's call to indicate conflicts with their schedules. The auditor should select a mutually agreeable time to reschedule when notified of a conflict.

b. Print a hard copy from the Authorization Program of the authorization you will be auditing, this will include:

- (1) Administrative data
- (2) Personnel and training dates
- (3) Rooms
- (4) Isotopes and limits authorized

c. Print Isotope Inventory Report Form from dBase Inventory data base, to list the isotope shipments received since the last audit and the isotopes still active from the previous audit. This will include the following information for each isotope shipment for the authorization requested:

- (1) HPO tag number
- (2) Chemical form
- (3) Date received
- (4) Original activity in millicuries
- (5) A blank to list new activity in millicuries
- (6) Last updated activity in millicuries
- (7) Vendor
- (8) Purchase order number
- (9) Call number
- (10) Remarks

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# HSHL-HP SOP# 1-26

October 28, 1993

d. Two copies of the Audit Form with a carbon are prepared so a signed copy can be left with the Principle User at the time of the audit.

e. The folder containing the previous inventory records for this authorization will be pulled from the HPO file.

5. CONDUCTING AN AUDIT: The material assembled in Item 4. b, c, d and e above will be taken by the auditor to the audit. The WRAMC "Audit of Radioactive Material" form will be used as a check list of the major areas of each authorization which need to be inspected. These are:

a. DA Form 3862 (or equivalent) Inventory Records: The authorizations inventory records will be compared to the "Isotope Inventory Report" (see item 4. c.) to ensure they include all shipments delivered to them by the HPO. Each entry in the inventory records shall contain: the isotope, the HPO tag number, date received, activity received, chemical form of compound, the activity used and disposed of, and the activity remaining. The "Isotope Inventory Report" will be completed at this time to show the new "updated activity" for each shipment. This form will be signed and dated at the bottom by the person providing the inventory information and will be used to update the inventory database at the HPO. It will remain on file as a permanent inventory record.

b. Within limits: The authorizations inventory records shall indicate a running balance of activity on hand for each isotope which is authorized. The PU is responsible for ensuring that the isotope limits of each isotope are not exceeded at any time and the auditor will check the running balance against the isotope limits listed on the computer generated copy of the authorization (see item 4. b. (4)).

c. Inventory Control Officer: The individual responsible for the inventory record keeping (PU or Technician).

d. WRAMC Reg 40-10: A copy must be available to radiation workers for information on the safe handling of radioactive material.

e. WRAMC Authorization: A copy of the approved authorization and any amendments most be maintained by the PU. At this time the computer generated copy of the information on the authorization (see item 4. b.) will be shown to the PU and any discrepancies clarified. Any changes which need to be made

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October 28, 1993

HSHL-HP SOP# 1-26

in the authorization can be noted in items 11 or 12 on this form and it will be considered as an amendment request if signed by the PU.

f. General Provisions & Terms and Conditions: A copy must be maintained on file.

g. LSC - Source No. & Location: The location of any liquid scintillation counters with sealed source numbers will be noted.

h. WRAMC 538 "Radiation Worker Briefing Card": This form, required annually for each radiation worker, shall be requested if it has been determined that present records are not current (see item 4. f.).

i. Sink Log: A logbook listing amounts of radioactive material placed into the sanitary sewage system through a wash sink must be available for each wash sink on the authorization. Entries must be made at least monthly when no washes have been performed to indicate that fact. The monthly limit for wash sinks is 100 uCi.

j. Signs and Labels: Each controlled area shall be identified with the appropriate signs such that all employees and visitors who enter shall be informed of the pertinent requirements and procedures for the protection of themselves and fellow workers against internal and external exposure. The following areas and/or documents must be posted:

- (1) Wash Sinks
- (2) LSC
- (3) Entrance/Exit
- (4) NRC Form 3 (map)

(5) Notice to Employees Letter

(6) Parts 19&21 of 10CFR

k. Personnel Changes: Additions or deletions. The Audit Form can be used as a memo to make personnel changes if it is signed by the PU (no authorized representative can make amendments to the authorization).

# HSHL-HP SOP# 1-26

October 28, 1993

1. General Comments: List pertinent information which should be communicated to the office such as: posting new equipment, renovations of labs, pregnant workers, computer changes, name changes, etc.

m. Signature & Date of Principal User or Authorized Representative: Signature of PU needed to amend the authorization.

6. DEFICIENT AUDIT FORM: Given if the authorization is being improperly maintained for any of the following reasons:

a. Not maintaining correct inventory records.

b. Not within possession limits.

c. Failure to amend authorization to reflect changes in personnel, rooms, etc.

d. Failure to adhere to proper work practices.

ARTHUR G. SAMILJAN LTC, MS Health Physics Officer

HSHL-H-HP (385-111)

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### MEMORANDUM FOR

# SUBJECT: Health Physics Office Audit of Radicactive Material Inventory for Authorization Number

1. This office is required to conduct periodic audits of the radioactive materials inventory for your Authorization.

2. You are scheduled to be audited on \_\_\_\_\_\_at \_\_\_\_\_hours. It is requested that the inventory officer for your Authorization be available to present inventory records and accompany the auditor during the inventory verification inspection.

3. If the date/time of the scheduled audit is not satisfactory, please contact Mr. David W. Burton, Chief, Radioactive Materials Control Branch, Telephone: 427-5104, to make alternate arrangements.

David W. Burk

DAVID W. BURION C. Radioactive Material Control Br. Health Physics Office

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Encis.2

WRAMC Audit of Radioactive Material (In accordance with AR 49-37 & 49-61)

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|     | Inspector:       | Da                                     | ata:     |             | Auth‡      |
|-----|------------------|----------------------------------------|----------|-------------|------------|
|     |                  |                                        |          |             |            |
| l.  | DA form 3862     | [NO]                                   | [YES]    | •           |            |
| 2.  | Within limits    | [00]                                   | [YES]    |             |            |
| 3.  | Inventory Contro | i Offics<br>Roc                        | er:      |             |            |
| 4.  | WRAMC Regulation | 40-10                                  | [00]     | [YES]       |            |
| 5.  | WRAMC Authorizat | ion on 1                               | hand     | [N0]        | [YES]      |
| 6.  | General Provisio | as - Te                                | rms & Co | nditions    | [NO] [YES] |
| 7.  | LSC - Source No. | . & Loca                               | tion:    |             |            |
| 8.  | WRAMC form 538 - | - curren                               | ะ [NO]   | [YES]       |            |
| 9.  | Sink Log. [NO]   | [YES                                   | .]       |             |            |
| 19. | Signs & Labels:  |                                        |          | •           | • •        |
| 11. | Personnel (Add:  | itions}                                | (Dele    | tions}      |            |
| 12. | General Comment: | S =                                    | <u> </u> |             |            |
|     |                  | ······································ |          |             |            |
|     | rincipal Maar-   |                                        | 3        | and said Be |            |

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Signature

Date

|                 |                     | Fer                                    | use of this form, see A  | R 40-2; the prop   | onent agency is O | fice of The Surgeon ( | ieneral.                                |                          |                    |
|-----------------|---------------------|----------------------------------------|--------------------------|--------------------|-------------------|-----------------------|-----------------------------------------|--------------------------|--------------------|
| STOCK NUMBER    |                     |                                        | DESCRIPTION              |                    |                   |                       |                                         |                          |                    |
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DA 1 JUNE 72 3862

REPLACES DA FORM 8-235, 1 AUG 51, WHICH WILL BE USED.

·

NAME (Last, First, MI)

DUTY MAILING ADDRESS AND TELEPHONE NUMBER

As Principal User I have insured that the above named individual has received a briefing on the following subjects in accordance with Title 10 Code of Federal Regulations Part 19.

- 1. Walter Reed Army Medical Center's "NOTICE TO EMPLOYEES"
- 2. Form NRC-3

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- 3. Title 10 Code of Federal Regulations Parts 19, 20 and 21.
- 4. Information concerning the storage, transfer and use of radioisotopes allowed under this authorization.
- 5. Authorization To Use Radioisotopes (WRAMC Form 1662R)
- 6. Hazards and protective measures associated with isotope usage.
- 7. Procedures for requesting a report of exposure to radiation.

| DATE -                 | PRINTED NAME AND SI                 | GNATURE OF PRINCIP  | AL USER   | AUTHORIZATION   | NUMBER |
|------------------------|-------------------------------------|---------------------|-----------|-----------------|--------|
| I have receive<br>DATE | d and understand the<br>  SIGNATURE | above listed inform | mation.   |                 |        |
| WRAMC FORM 538         | Enc. 15.4                           |                     | RADIATION | VORKER BRIEFING | ;      |

| HSH | L-HP (38    | 35 <b>-11m)</b>                                                                                                                            |
|-----|-------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| MEN | ORANDUM     | FOR                                                                                                                                        |
| SUE | JECI: J     | Isotope Audit of Authorization                                                                                                             |
| 1.  | On          | an Isotope Audit of Author                                                                                                                 |
| iza | tion        | was conducted by the Health Physics Office.                                                                                                |
| 2.  | During      | the Audit, deficiencies were noted for the following reasons:                                                                              |
|     |             | Failure to maintain a central record of isotope receipt and usage.                                                                         |
|     | ••••••••    | Isotope shipment delivered to authorization not noted on inventory poords.                                                                 |
|     |             | Incorrect entries in the records in regards to the amounts of mater. present.                                                              |
|     | <u></u>     | Not within possession limits.                                                                                                              |
|     |             | Failure to notify the Health Physics Office of changes in Authoriza<br>(MEMORANDUM stating Additions or Deletions) of personnel, rooms etc |
|     | <del></del> | Failure to adhere to all work practices as listed in WRAMC Regulati<br>40-10 and/or Authorization Terms and Conditions. Specifically:      |
|     |             |                                                                                                                                            |
|     |             |                                                                                                                                            |
|     |             |                                                                                                                                            |
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|     |             |                                                                                                                                            |

3. Request receipt of a MEMO listing corrected deficiencies, and/or procedure which will ensure future compliance with regulations.

Encl .5.5

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DAVID W. BURTON Chief, Radioactive Material Branch Health Physics Office



DEPARTMENT OF THE ARMY WALTER REED ARMY MEDICAL CENTER WASHINGTON, DC 20307-5001



HSHL-HP (385-11)

13 May 1994

MEMORANDUM THRU

Commander, U.S. Army Health Services Command, ATTN: HSCL-P. Fort 20 MAY 91

HQDA (SGPS-PSP-E), 5109 Leesburg Pike, Falls Church, VA 22041-3258

FOR U.S. Nuclear Regulatory Commission, Region I, Nuclear Safety Section A, 475 Allendale Road, King of Prussia, PA 19406

SUBJECT: Amendment of US Nuclear Regulatory Commission Licenses No. 030-01317 and No. 030-06895

1. Request that NRC Licenses 030-0173f - 03to reflect a change in the Radiation Safety Officer from CPT Mark A. Melanson to LTC William B. Johnson. LTC Johnson has been assigned as the Chief, Health Physics Office at Walter Reed Army Medical Center since 9 May 1994.

2. A Training and Experience Form and a Curriculum Vitae for LTC Johnson are attached (Enclosures 1 and 2).

3. POC for this mapter is Mr. David W. Burton or LTC Johnson @ (301)-427-5104/5107.

FOR THE COMMANDER:

2 Encls

EARL'S. NEWSOME III LTC, MS Executive Officer

-M00506080430

|                                                                                      |                                  | ······                                                                                                                                                                                         | ^                                                                                     |                                                                  |  |  |  |
|--------------------------------------------------------------------------------------|----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|------------------------------------------------------------------|--|--|--|
| NRC FORM 313M                                                                        | I SUPPLEMEN . A                  | US NUC<br>TRAINING AND EXPERIENC<br>DUSER OF RADIATION SAU                                                                                                                                     | LE. REGULATOR                                                                         | RY COMMISSION                                                    |  |  |  |
| 1. NAME OF AUT<br>RADIATION SA<br>WILLIAM B. J                                       | THORIZED USER<br>AFETY OFFICER   | OR                                                                                                                                                                                             | 2. STATE OR TERRITORY IN<br>WHICH LICENSED TO<br>PRACTICE MEDICINE:<br>NOT APPLICABLE |                                                                  |  |  |  |
| 3. CERTIFICATION                                                                     |                                  |                                                                                                                                                                                                |                                                                                       |                                                                  |  |  |  |
| SPECIALTY<br>A                                                                       | Y BOARD                          | CATEGORY<br>B                                                                                                                                                                                  | MONTH & YEAR CERTIFIED<br>C                                                           |                                                                  |  |  |  |
| NOT APPI                                                                             | LICABLE                          | NOT APPLICABLE                                                                                                                                                                                 | NOT APPLICABLE                                                                        |                                                                  |  |  |  |
| 4. TRA                                                                               | AINING RECEIVE                   | D IN BASIC RADIOACTIVE 1                                                                                                                                                                       | HANDLING TECHN                                                                        | IQUES                                                            |  |  |  |
|                                                                                      |                                  |                                                                                                                                                                                                | TYPE & LENGT                                                                          | I OF TRAINING                                                    |  |  |  |
| FIELD OF 7                                                                           | ΓRAINING<br>\                    | LOCATION AND DATE(S)<br>OF TRAINING<br>B                                                                                                                                                       | LECTURE/<br>LABORATORY<br>COURSES<br>(Hours)<br>C                                     | SUPERVISED<br>LABORATORY<br>EXPERIENCE<br>(Hours)<br>D           |  |  |  |
| a. RADIATION P<br>INSTRUMENT.                                                        | HYSICS AND<br>ATION              | <ol> <li>Univ of North Carolina,<br/>Chapel Hill, NC,<br/>1980-1983 (3 years)</li> <li>Tulane, New Orleans,<br/>LA, 1976 (1 year)</li> <li>Ft. Belvoir, VA, 1970-<br/>1971 (1 year)</li> </ol> | 80<br>60<br>168                                                                       | 92                                                               |  |  |  |
| b. RADIATION P                                                                       | ROTECTION                        | <ol> <li>Reference 1 above</li> <li>Reference 3 above</li> </ol>                                                                                                                               | 140<br>80                                                                             | 60<br>120                                                        |  |  |  |
| c. MATHEMATIC<br>USE AND ME.<br>OF RADIOACT                                          | CS IN THE<br>ASUREMENT<br>FIVITY | <ol> <li>Reference 1 above</li> <li>Reference 3 above</li> </ol>                                                                                                                               | 125<br>60                                                                             |                                                                  |  |  |  |
| d. RADIATION F                                                                       | BIOLOGY                          | <ol> <li>Reference 1 above</li> <li>Reference 3 above</li> </ol>                                                                                                                               | 40<br>40                                                                              |                                                                  |  |  |  |
| e. RADIOPHARM<br>CHEMISTRY                                                           | IACEUTICAL                       | <ol> <li>Reference 1 above</li> <li>Reference 3 above</li> </ol>                                                                                                                               | 200                                                                                   | 60<br>20                                                         |  |  |  |
| 5. EXPERIENCE WITH RADIATION. (Actual use of Radioisotopes or Equivalent Experience) |                                  |                                                                                                                                                                                                |                                                                                       |                                                                  |  |  |  |
| ISOTOPE MAXIMUM<br>AMOUNT                                                            |                                  | WHERE EXPERIENCE<br>GAINED                                                                                                                                                                     | DURATION OF<br>EXPERIENCE                                                             | TYPE OF USE                                                      |  |  |  |
| SM-1 Nuclear 1000 KW<br>Power Reactor                                                |                                  | SM-1, Ft. Belvoir, VA                                                                                                                                                                          | 1971<br>(1 year)                                                                      | Health Physics<br>Surveys; Reactor<br>operations;<br>Calibration |  |  |  |

NRC FORM 313M Supplement A - PAGE 1

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Training and Experience continued WILLIAM B. JOHNSON

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| 5. EXPERIENCE WITH RADIATION.(Actual use of Radioisotopes or Equivalent Experience)                                                                                                                 |                                                                                                                                                                                                                     |                                                                                                                                                                                           |                                 |                                                                                             |  |  |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|---------------------------------------------------------------------------------------------|--|--|--|
| ISOTOPE                                                                                                                                                                                             | MAXIMUM<br>AMOUNT                                                                                                                                                                                                   | WHERE EXPERIENCE<br>GAINED                                                                                                                                                                | DURATION OF<br>EXPERIENCE       | TYPE OF USE                                                                                 |  |  |  |
| <ul> <li><sup>235</sup>U</li> <li><sup>238</sup>U</li> <li><sup>239</sup>Pu</li> <li><sup>Pu-Be</sup></li> <li><sup>241</sup>Am</li> <li><sup>137</sup>Cs</li> <li><sup>3</sup>H</li> </ul>         | <ul> <li>216 gm unsealed &amp; soln. sources</li> <li>3 gm unsealed source</li> <li>43 gm, liquid sources</li> <li>3 Ci, Sealed</li> <li>600 mCi, Sealed</li> <li>120 Ci, Sealed</li> <li>110 Ci, Sealed</li> </ul> | U.S. Army Environmental<br>Hygiene Agency Aberdeen<br>Proving Ground, MD<br>NRC Byproduct Material<br>License                                                                             | 1973-1974<br>(1 year)           | Health Physics<br>Surveys;<br>Alternate RSO;<br>Calibration                                 |  |  |  |
| Atomic No.<br>3-83<br><sup>3</sup> H<br><sup>131</sup> I<br><sup>125</sup> I<br><sup>13</sup> C                                                                                                     | 5 mCi each<br>10 mCi, liquid<br>10 mCi, liquid<br>1 Ci, liquid<br>1 Ci, liquid                                                                                                                                      | US Army Medical Lab<br>Ft. Sam Houston, TX<br>Radiation Safety Officer<br>NRC Byproduct Material<br>License (Medical)                                                                     | 1974-1975<br>(1 year)           | RSO, RIA kits,<br>Iodinations,<br>Health Physics<br>Surveys; Wet<br>Chemistry<br>procedures |  |  |  |
| <sup>99</sup> Mo/ <sup>99m</sup> Tc<br>Generator                                                                                                                                                    | 2 Ci                                                                                                                                                                                                                | North Carolina Memorial<br>Hospital<br>Chapel Hill, NC                                                                                                                                    | 1982<br>(1 month)               | Clinical<br>Training                                                                        |  |  |  |
| Atomic No.<br>3-83<br>10 CFR 35<br>Gp I-II<br>Gp III<br>Gp IV-V<br><sup>133</sup> Xe<br><sup>137</sup> Cs<br><sup>153</sup> Gd                                                                      | 25 mCi each<br>As needed<br>3 Ci each<br>As needed<br>40 mCi<br>131 Ci<br>2 Ci                                                                                                                                      | Dwight D. Eisenhower Army<br>Medical Center, Fort Gordon,<br>GA<br>Radiation Safety Officer for<br>Hybrid Broad Scope NRC<br>Materials License (Medical)<br>USNRC No. 10-12044-03         | May 1983-June<br>1989 (6 years) | RSO, Radiation<br>Safety Surveys,<br>Medical Physics<br>Surveys,<br>Calibration             |  |  |  |
| Atomic No.15 Ci total, $\leq 200$<br>mCi each $^{14}C$ , $^{3}H$ ,<br>$^{99}Mo$ , $^{99m}Tc$ 5 Ci each, any<br>form $^{32}P$ , $^{125}I$ 1 Ci each, any<br>form $^{137}Cs$ 200 Ci, sealed<br>source |                                                                                                                                                                                                                     | Uniformed Services University<br>of the Health Sciences,<br>Bethesda, MD<br>Radiation Safety Officer for<br>Broad Scope Type A NRC<br>Material License (Medical)<br>USNRC No. 19-23344-01 | May 1989-June<br>1992 (3 years) | RSO, Health<br>Physics<br>Surveys,<br>Calibration                                           |  |  |  |

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NRC FORM 313M TRAINING AND EXPERIENCE CONTINUED - PAGE 2

# Training and Experience continued WILLIAM B. JOHNSON

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| 5. EXPERIENCE WITH RADIATION.(Actual use of Radioisotopes or Equivalent Experience) |                                                               |                                                                          |                                      |                                                                |  |  |  |
|-------------------------------------------------------------------------------------|---------------------------------------------------------------|--------------------------------------------------------------------------|--------------------------------------|----------------------------------------------------------------|--|--|--|
| ISOTOPE MAXIMUM<br>AMOUNT                                                           |                                                               | WHERE EXPERIENCE<br>GAINED                                               | DURATION OF<br>EXPERIENCE            | TYPE OF USE                                                    |  |  |  |
| <sup>235</sup> U<br><sup>238</sup> U                                                | 216 gm unsealed &<br>soln. sources<br>3 gm unsealed<br>source | U.S. Army Environmental<br>Hygiene Agency Aberdeen<br>Proving Ground, MD | June 1992 -<br>May 1994<br>(2 years) | Health Physics<br>Surveys;<br>Principle User,<br>Member of the |  |  |  |
| <sup>239</sup> Pu<br>Pu-Be<br><sup>241</sup> Am                                     | 43 gm, liquid<br>sources<br>3 Ci, Sealed<br>600 mCi, Sealed   | NRC Byproduct Material<br>License                                        |                                      | Radiation<br>Control<br>Committee                              |  |  |  |
| <sup>137</sup> Cs<br><sup>3</sup> H                                                 | 120 Ci, Sealed<br>110 Ci, Sealed                              | •                                                                        |                                      |                                                                |  |  |  |
|                                                                                     |                                                               |                                                                          |                                      |                                                                |  |  |  |
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| I                                                                                   |                                                               | <u> </u>                                                                 | 1                                    | L                                                              |  |  |  |

NRC FORM 313M TRAINING AND EXPERIENCE CONTINUED - PAGE 3

# CURRICULUM VITAE

# LTC WILLIAM B. JOHNSON, Ph.D, Medical Service Corps, US Army

Address: Residence:

Work:

Walter Reed Army Medical Center Chief, Health Physics Office Washington D.C. 20307-5001 Phone: (301) 427-5104

# ACADEMIC AREAS OF INTEREST:

Health Physics, Medical Physics, Optimizing Medical Images, Quality Control in Radiology, Computers, Public Health

### **EDUCATION AND TRAINING:**

## CIVILIAN TRAINING:

University of North Carolina, Chapel Hill, NC, Ph.D., Radiological Hygiene,

Tulane School of Public Health and Tropical Medicine, New Orleans, LA, MPH, Environmental Health, 1976.

Iowa State University, Ames, IA, BS, Mathematics,

Medical X-Ray Protection Course, USPHS, Rockville, MD, 2 weeks, 1973.

Ionizing and Nonionizing Radiation in Medicine, University of Pennsylvania, Philadelphia, PA, 1 week, 1979.

Electronic Imaging in Medicine, University of Texas at San Antonio, TX, 1 week, 1983.

Health Physics Aspects of Nuclear Attack, Health Physics Summer School, Louisiana University, Hammond, LA, 1 week, 1984.

Health Physics In Radiation Accidents, Oak Ridge Associated Universities, Oak Ridge, TN, 1 week, 1985.

MRI Acceptance Testing and Quality Control, The Bowman Gray School of Medicine, Winston-Salem, NC, 1 week, 1988.

International Society for Optical Engineering Medical Imaging V Meeting, San Jose, CA, 1 week, 1991.

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American College of Radiology's Mammographic Image Quality Course: Role of the Medical Physicist, January 1993, 18 CME credits awarded.

#### MILITARY TRAINING:

Nuclear Power Plant Operator Course (Health Physics Specialty), Ft. Belvoir, VA, 1 year, 1971.

AMEDD (MSC) Officer Basic Course, Ft. Sam Houston, TX, 9 weeks, 1972

AMEDD Officer Advanced Course, Ft. Sam Houston, TX, 24 weeks, 1975.

Command and General Staff Officer Course (Correspondence Option), 1 year, 1987.

Faculty Development Course, Academy of Health Sciences, Ft. Sam Houston, TX, 4 weeks, 1976.

Medical Effects of Nuclear Weapons, Armed Forces Radiobiology Research Institute, Bethesda, MD, 1 week, 1983.

Medical Physics and Military Medicine, US Army Environmental Hygiene Agency, Aberdeen Proving Ground, MD, 1 week, 1983, 1985, 1987, 1988, 1989, 1991, 1993.

### **TEACHING EXPERIENCE:**

1990-1993, Assistant Professor of Preventive Medicine and Biometrics, Uniformed Services University of the Health Sciences, Bethesda, MD.

1977-1979, Instructor, Radiological Physics, Academy of Health Sciences, Ft. Sam Houston, TX.

1977-1979, Assistant Professor of Health Sciences, Baylor University at San Antonio, San Antonio, TX.

1969-1970, High School Teacher (Mathematics), Grant Community High School, Fox Lake, IL.

### **PROFESSIONAL EXPERIENCE:**

1. June 1992 to May 1994, Chief, Health Physics Division, U.S. Army Environmental Hygiene Agency, Aberdeen Proving Ground, MD.

Duties: Leads and manages the Health Physics Division composed of the Medical Health Physics Branch, the Industrial Health Physics Branch and an Administrative Section. Directs the activities of some 25 professional health physicists in world wide mission of support of U.S. Army Radiation Protection Programs. Support includes complete radiation protection program evaluations for compliance with Federal, Army, and Nuclear Regulatory Commission (NRC) Licenses for Medical and Industrial facilities, medical and industrial x-ray surveys, radiation dose assessments from bioassay data, assistance in preparation of documents to terminate NRC licenses, and conducting verification surveys for NRC License termination. Radiation protection policies are developed for the Army Surgeon General for implementation Army wide. Act as principle user of radioactive materials, supervisor of <sup>137</sup>Cs irradiator for calibration, and member of the Radiation Control Committee.

2. June 1989 to June 1992, Deputy Director, Environmental Health and Occupational Safety; Chief, Radiation Safety and Radiation Protection Officer, Uniformed Service University of the Health Sciences (USUHS), Bethesda, MD.

Responsible for the supervision and management of Duties: broad scope US Nuclear Regulatory Byproduct Materials License No. Supervises health physics personnel in the perfor-19-23344-01. mance of laboratory radiation protection surveys, personnel dosimetry program, laboratory analysis, and radioactive material control. Provides technical advice to some 350 radiation workers working in about 150 radioisotope laboratories. Teaches in various graduate level courses in Preventive Medicine and Radiology. Provides technical consultation to Director and other Branch Chiefs. Acts as the Director when the Director is absent. Has been designated the Medical Physics Consultant on acquisition and acceptance testing of Computerized Tomography (CT) Systems and Magnetic Resonance Imaging (MRI) Systems for the Army Surgeon This CT and MRI mission is world wide. General.

3. June 1983-June 1989, Chief, Health Physics, Dwight D. Eisenhower Army Medical Center, Ft. Gordon, GA.

Served as Chief, Health Physics, and Radiation Duties: Protection Officer. Responsible for supervision and management of broad scope radiation protection program including management of US Nuclear Regulatory Byproduct Materials License No. 10-12044-03 and Department of Army Radioactive Materials Authorization No. 10-07-Served as Regional Consultant to DOD Health Region 10, which 81. includes 9 Army Community Hospitals, and clinics in Panama and Puerto Rico. Performs Technical Surveys of radioactive materials and radiation producing devices to evaluate health hazards and performs medical physics evaluations to optimize imaging. Provides education support to professional staff. Supervises the personnel dosimetry program and performs dosimetry analysis of both radiation workers and patients. Is the Medical Physics Consultant on acquisition and acceptance testing of Computerized Tomography (CT)

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Systems and Magnetic Resonance Imaging (MRI) Systems for the Army Surgeon General. This CT and MRI mission is world wide.

4. September 1976 - June 1980, Chief, X-Ray Branch, Academy of Health Sciences, Ft. Sam Houston, TX.

Duties: Programs, plans and supervises overall operation of branch, including performance of 36 instructors and about 430 students annually. Branch is responsible for teaching the x-ray technologist program (radiographic) for the US Army. Also coordinates, plans, and supervises clinical training. Serves as Chairman of X-Ray Specialist Curriculum Committee, and Chairman of Medicine and Surgery Division Physics and Biophysics Committee. Serves as subject matter expert in radiology for Combat Development and Health Care Systems.

5. January 1975 - July 1975, Chief, Health Physics Branch, US Army Environmental Hygiene Agency Regional Activity South, Ft. Sam Houston, TX.

Duties: Conducts radiation protection surveys of US Army installations containing or generating ionizing radiation. Geographical area of support is all states west of the Mississippi River. Also reviews NRC license and DA Authorization applications. Performs technical consultation on radiation safety hazards.

6. March 1974 - December 1974, Chief, Department of Nuclear Medical Sciences, US Army Medical Laboratory, Ft. Sam Houston, TX.

Supervises laboratory procedures and techniques of Duties: radiation biology, radiochemistry, and biophysics for regional reference laboratory. Geographic area of support includes United States, Pacific Region, Korea, and Panama. Supervises radiation detection measurements, preparation and analysis of radioisotopes in support of diagnostic and other clinical procedures. Provides support on environmental surveillance. Advises on radiological hygiene matters to prevent unnecessary exposure of personnel to Performs duty of Chairman, Radioisotope ionizing radiation. Committee, and Radiological Protection Officer. Manages all . aspects of AEC License No. 42-06316-01, and Department of Army Authorization for Radioactive Materials. Performs Health Physics surveys and overall monitoring of all Laboratory Departments engaged in work involving radioactive material.

7. January 1973 - February 1974, Survey Officer, Health Physics Division, US Army Environmental Hygiene Agency, Aberdeen Proving Ground, MD.

Duties: Reviews AEC license and Department of Army Authorizations applications as well as drafts Army directives and technical publications pertaining to radiological health; evaluates proposed in-system items containing or generating ionizing radiation; makes on-site surveys of Army diagnostic, industrial, and therapeutic xray facilities, radioactive sources, accelerators, human use of radioisotopes and other sources of ionizing radiation; prepares reports with recommendations for corrective action; assists in training activities. Performs as Alternate Radiological Protection Officer. This requires preparation and maintenance of records and reports on receipt, issue, use, inventory, storage, and disposal of radioactive materials. Performs health physics surveys of all agency divisions engaged in working with radioactive materials.

8. September 1972 - October 1972, Health Physics Technician, SM1 Nuclear Power Plant, Ft. Belvoir, VA.

Duties: Conducts radiological surveys, performs treatment to maintain proper process fluid conditions of nuclear power plant. Operates nuclear power plant controls and equipment. Assists in refueling operations and preparing spent fuel elements and demineralizers for storage and shipment. Monitors process fluids for radioactivity and performs chemical separations. Conducts radiological surveys of nuclear power plant personnel, equipment, work areas and reactor elements.

# MEMBERSHIPS, PAPERS, PRESENTATIONS AND AWARDS:

Member, Health Physics Society (1973) Member, Eta Chapter, Delta Omega Society (1977)

"The Final Step in Decommissioning of the SM-1A Nuclear Power Plant: A Closeout Survey," AEHA Report No. 43-001-74, Health Physics National Meeting, 1974.

"A Data Base Management System For Real-Time Monitoring of Operating Parameters of A Diagnostic X-Ray System," Ph.D. Dissertation, University of North Carolina, Chapel Hill, NC, 1983.

"Computerized Quality Assurance in Diagnostic Radiology," Health Physics National Meeting, Baltimore, MD, 1983.

"Acceptance Testing of Computerized Tomography Systems," Savannah River Chapter Health Physics Society Meeting, September 1985.

"Operational Problems for a Radiation Protection Program at A Major Medical Institution," Medical Physics in Military Medicine Course, AEHA, MD, September 1987.

"A Protocol to Comply With The Joint Commission of Accreditation of Health Care Organizations Requirements in Diagnostic Radiology," Medical Physics In Military Medicine Course, AEHA, MD, October 1988.

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|--------|-----|---------------------------------------------------|------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|---------------------------------------|-------------------------------------------------------------------|----------------------------------------------|----------------------------------------|---------------------------------------|
| •      |     |                                                   | ۲<br>                                                                                                            |                                                                                          | · · ·                                 | L                                                                 | icense No                                    | . 68-01738                             | 12                                    |
|        |     |                                                   |                                                                                                                  | ۰ <i>۰</i>                                                                               |                                       | D                                                                 | ocket No.                                    | 130-01317                              | 2                                     |
|        |     |                                                   |                                                                                                                  | $\backslash$                                                                             |                                       | N                                                                 | ILER-RI_                                     | 2000-004                               |                                       |
|        | LIC | ENSEE:                                            | Army,                                                                                                            | Dept. 0                                                                                  | of                                    | . <u>—</u>                                                        |                                              |                                        | · · · · ·                             |
|        | EV  | ENT DES                                           |                                                                                                                  | shield int                                                                               | egrity / Pes                          | ion Fusti                                                         | UMENTO                                       | calibration                            | Source                                |
|        | EV  | ENT DAT                                           | E <u>Feb.</u>                                                                                                    | 11, 2000                                                                                 | REPORT                                | DATE Fe                                                           | 6 11,20                                      | 000                                    | _                                     |
|        | 1.  | <u>REP</u><br>() 10<br>() 10<br>() 10<br>() 0     | ORTING RE(<br>) CFR 20.22(<br>) CFR 20.22(<br>) CFR 30.50<br>(her 10 CF                                          | QUIREMENT<br>01 Theft or Loss<br>03 30 Day Repo<br>Report<br>R Part 2                    | s<br>ort                              | ( ) 10 CF<br>( ) Licens                                           | FR 35.33 N<br>se Conditi                     | <i>l</i> isadministratic<br>on         | pn                                    |
|        | 2.  | <u>REG</u>                                        | ION I RESP                                                                                                       | ONSE                                                                                     | · · ·                                 |                                                                   |                                              |                                        | <br>                                  |
|        |     | () In<br>() Si<br>() To<br>() Pi<br>() In<br>() R | nmediate Site<br>pecial Inspec<br>elephone Inq<br>reliminary No<br>formation En<br>eview at Nex<br>eport Referre | e Inspection<br>tion<br>uiry<br>tification<br>tered on the R<br>t Routine Inspe<br>ed to | ()Daily F<br>I Log<br>ection          | Inspecto<br>Inspecto<br>Inspecto<br>Report                        | or/Date<br>or/Date<br>or/Date                |                                        |                                       |
|        | 3.  | ()<br>()<br>()<br>()<br>()<br>()<br>()            | ORT EVALU<br>escription of<br>evels of RAM<br>ause of Ever                                                       | ATION<br>Event<br>I Involved<br>ht                                                       | (4)<br>(*)<br>( )                     | Corrective A<br>Calculation A<br>Letter to Lice<br>Additional Inf | ctions<br>Adequate<br>ensee Req<br>formation | uesting                                |                                       |
|        | 4.  | SPE                                               | CIAL INSTR                                                                                                       | UCTIONS OR                                                                               | COMMENTS                              | ,*<br>                                                            |                                              |                                        |                                       |
|        |     |                                                   |                                                                                                                  |                                                                                          | · · ·                                 |                                                                   | ·.<br>·.                                     |                                        |                                       |
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|        | C   | ompleted                                          | Ву:                                                                                                              | wer B                                                                                    | unacha                                | ······                                                            | Date                                         | 4/07/00                                | · · ·                                 |
|        | R   | eviewed E                                         | 3y Jere                                                                                                          | so A.                                                                                    | Jarden                                | <u> </u>                                                          | _ Date                                       | 4/7/2000                               | <u>&gt;</u>                           |
|        |     |                                                   | •                                                                                                                |                                                                                          |                                       |                                                                   | •                                            |                                        | 1                                     |
|        | G   | S:\LAS\LE                                         | RForm<br>2/20/99                                                                                                 | Information in<br>in accordance<br>Act, exemption                                        | this record was<br>with the Freedom   | deleted<br>of Information                                         |                                              | m                                      | MID                                   |
|        |     |                                                   |                                                                                                                  | FUIA- 3006                                                                               | -0732                                 |                                                                   | MLO                                          | 0374373                                | 2                                     |

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#### DEPARTMENT OF THE ARMY WALTER REED ARMY MEDICAL CENTER WALTER REED HEALTH CARE SYSTEM WASHINGTON, DC 20307-5001

March 31, 2000

200 APR -5 PM 1:40

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Preventive Medicine Services

REPLY TO ATTENTION OF

SUBJECT: Report of Shield Assembly Defect for Irradiator

U. S. Nuclear Regulatory Commission, Region I James P. Dwyer, Senior Health Physicist 475 Allendale Road King of Prussia, PA 19406

Mr. Dwyer,

Walter Reed Army Medical Center (WRAMC) uses radioactive material authorized by U.S. Nuclear Regulatory Commission (NRC) Byproduct Material License Number 08-01738-02 with an expiration date of June 30, 2004. This is a medical broadscope Type A license for medical diagnosis, therapy, and research in humans. A product defect with a Cesium-137 irradiator listed under paragraph 6CC of the license has been noted. Initial notification of the problem and the proposed corrective actions was made in a telephone call to Mr. James Dwyer, Senior Health Physicist, USNRC, Region I, King of Prussia, PA at about 2:30 pm on February 11, 2000. The following information is provided in accordance with the requirements of Title 10, Part 21.21.

On February 11, 2000, a problem with shield integrity was noted with a Cesium-137 (Cs-137) instrument calibration source. It is a Gamma Calibration Unit, initially loaded with an

Cs-137 source; the current activity is about The source shield assembly is a <sup>1</sup>/<sub>4</sub> inch steel cylinder 18 inches in diameter, welded to a base plate. A 2-inch cylinder containing the radiation source is located in the middle of the shield assembly with the void between the inner cylinder and the outer shield assembly filled with lead shot. It was observed that the weld between the shield assembly and the base plate was cracked and the shield assembly was at a slight tilt. A small amount of fine lead shot was observed on one side of the base plate. Exposure readings taken at contact with the shield assembly with a portable survey meter indicated 0.3 milliRoentgen/hr. This is a typical reading at contact on the shield assembly. Significant problems would occur if the shield assembly tilted further and the lead shot drained out from around the sealed source. Calculation indicates of Cs-137 with no shielding would yield an exposure rate at one meter of about 20 R/hr.
Industrial Operations Command (IOC), the DOD Executive Agent for disposal of radioactive material, was in the process of contracting with J. L. Shepherd & Associates, San Fernando, CA to remove the source and ship the source and the shield assembly to J.L. Shepherd. J.L. Shepherd employees were on site on February 11, 2000, examined the irradiator, and indicated the first priority should be to weld a steel plate around the shield assembly and to the base plate. IOC was contacted and were willing to expedite the operation. The irradiator had been inventoried on January 7, 2000, and no problems were noted with the irradiator at that time.

Personnel from J.L. Shepherd performed the maintenance fix on Monday February 14, 2000. The work to repair the irradiator shield assembly was accomplished without incident or any additional loss of shielding. It was determined after the shield was stabilized that the source itself moved freely within the cylinder and should be readily transferred to a shipping cask. A leak test of the source was also performed with no leakage indicated.

Three access ports at the top of the shield assembly for adding lead shot were opened and were found to be overflowing with lead shot. After probing with a screwdriver, areas of corroded/oxidized lead shot in big solid chunks were found within the shield assembly. If the lead shot has expanded this may explain how the shield assembly became tilted and why almost none of the lead shot drained out. No void spaces were found in the shield and a thorough survey of the exterior surfaces found no elevated radiation levels. A digital image of the irradiator with the steel collar welded to the base plate and shield assembly is enclosed.

The contractor returned March 27-29, 2000 and prepared and shipped this source and two other irradiators to J.L. Shepherd, San Fernando, CA. No problems with the repaired shield assembly were encountered during the preparation and transfer at WRAMC.

Point of contact for any questions regarding this subject are Colonel William B. Johnson, Chief, Health Physics, or Mr. David Burton, Chief, Radioactive Material Control Branch at (202) 356-0058.

Enclosure as

William B. Jøhnsor

Colonel, U.S. Army Chief, Health Physics Office

CF:

Proponency Office for Preventive Medicine, U.S. Army Center for Health Promotion & Preventive Medince, ATTN: POPM-SA (COL Daxon), 2050 Worth Road, Room 115, Ft. Sam Houston, TX 78234-601





DEPARTMENT OF THE ARMY WALTER REED ARMY MEDICAL CENTER WALTER REED HEALTH CARE SYSTEM WASHINGTON, DC 20307-5001

July 12, 2000

RECEIVED REGION 1

200 JUL 1.8 PM 3:45

NMSB1

030-01317

Preventive Medicine Service

Nuclear Regulatory Commission, Region I Medical Licensing Division 475 Alendale Road King of Prussia, Pennsylvania 19406-1415

Dear Sir or Madam:

Walter Reed Army Medical Center (WRAMC) uses radioactive material authorized by U.S. Nuclear Regulatory Commission (NRC) Byproduct Material License number 08-01738-02 with an expiration date of June 30, 2004.

We request to amend NRC license 08-01738-02 issued to WRAMC to appoint Colonel Dale K. Block to replace Colonel Yancy Phillips as the Chairperson of the Radiation Control Committee (RCC). Colonel Block will be the Deputy Director for Clinical Services which is a senior level executive management position, one level below the Hospital Commander. The Radiation Protection Officer, Colonel William B. Johnson, has carefully reviewed the Colonel Block's curriculum vitae (enclosure 1) and recommends approval as Chairperson of the RCC.

We request to amend NRC license 08-01738-02 issued to WRAMC to delete the Cs-137 sealed source irradiator line items 6CC, 7CC, and 8CC from the license. The irradiator was transferred to J.L. Shepard & Associates and removed from building 516, Forest Glen Section on March 29, 2000 (enclosure 2).

For any additional information, please contact the undersigned at (202) 356-0058.

Sincerely,

William B. Johnson

Colonel, U.S. Army Radiation Protection Officer

NMSS/RGN MAT

2 Enclosures

Copy Furnished:

Proponency Office for Preventive Medicine, ATTN: COL Eric Daxon, USACHPPM, 2050 Worth Road, Room 115, Ft. Sam Houston, Texas 78234-6010

> information in this record was deleted in accordance with the Freedom of Information Act, exemptions 2+6FOIA-2-006-038

# **CURRICULUM VITAE**

# DALE K. BLOCK Colonel, Medical Corps, United States Army

| PERSONAL/FAMILY<br>DATA:   | Born:<br>Wife:<br>Children:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CIVILIAN<br>EDUCATION:     | B.A., George Washington University, Washington, DC,<br>M.D., La Universidad Autonoma of Guadalajara, Guadalajara,<br>Jalisco, Mexico,                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| PROFESSIONAL<br>EDUCATION: | Internship: Rotating, Dalhousie University Medical Center,<br>Halifax, Nova Scotia, Canada, 1971-1972<br>Residency: Internal Medicine, Dalhousie University Medical<br>Center, Halifax, Nova Scotia, Canada, 1971-1974<br>Internal Medicine, Tripler Army Medical Center, Honolulu,<br>Hawaii, 1979-1980<br>Fellowship: Gastroenterology, William Beaumont Army Medical<br>Center, El Paso, Texas, 1980-1982                                                                                                                                                                                                                                                                                                                                                                                                                                |
| MILITARY<br>EDUCATION:     | Army Medical Department Basic Course, 1976<br>Army Medical Department Advanced Course, 1978<br>Command and General Staff College, 1986                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| ASSIGNMENTS:               | OIC, USAHC, Fort Detrick, Frederick, MD 1974-1978<br>Staff Gastroenterologist, USAMEDDAC, Fort Bragg, NC,<br>1982-1984<br>Chief, Department of Medicine USAMEDDAC, Fort Bragg, NC,<br>1984-1986 Deputy Commander for Clinical Services, Director of<br>Medical Education, USAMEDDAC, Fort Bragg, NC, 1986-1988<br>Chief, Personal Readiness Division, Directorate of Professional<br>Services; Consultant to The Surgeon General for Fitness Policy<br>and Consultant to The Surgeon General for Alcohol and Drug<br>Abuse, Department of Army, Falls Church, CA, 1988-1990<br>Commander, USAMEDDAC, Fort George G. Meade, MD<br>1990-1991<br>Deputy Director for Quality Assurance, Office of the Assistant<br>Secretary of Defense of Health Affairs (Professional Affairs and<br>Quality Assurance) Washington, DC 20301-1200, 1991-1992 |
|                            | INFORMATION WAS REMOVED                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

BY NRC. NO COPY OF THIS INFORMATION WAS RETAINED BY THE NRC.

May-5-00 14:27;

Deputy Director for Professional Affairs, (Professional Affairs and Quality Assurance) Washington, DC 20301-1200, 1992-1994 Staff Physician, Dewitt Army Community Hospital, Fort Belvoir, VA 22060, July-September 1994

Commander, ADUSAHC Pentagon, Washington, DC 20310-5801 and Chief, Department of Primary Care and Community Medicine, Walter Reed Army Medical Center, Washington, DC 20307 1994-Present

Clinical Instructor, School of Medicine, University of Hawaii, Honolulu, Hawaii, 1978-1980

Adjunct Professor, School of Pharmacy, University of the Pacific, Stockton, California, 1978-1980

Associate Professor of Medicine, Faculty of Medicine, Texas Tech University, Lubbock, TX, 1980-1982

Assistant Professor of Medicine, Uniformed Services University of the Health Sciences, Bethesda, MD, 1997-Present

General Practice, Ciudad Granja, Zapopan, Jalisco, Mexico, 1972-1973

Washington, DC, 1975-Present

American Board of Family Practice, 1978 American Board of Internal Medicine, 1981

"Un Estudio Epidemiologico de Ciudad Granja, Zapopan, Jalisco, Mexico" Doctoral Thesis, 1973 "Singultus and the Mallory-Weiss Syndrome" Case Studies and Review of the Literature

# ACADEMIC/ PROFESSIONAL APPOINTMENTS:

CLINICAL EXPERIENCE:

LICENSURE:

BOARD CERTIFICATION:

**PUBLICATIONS:** 

# SHEPHERD & ASSOCIATES 1010 Arroyo ave., San Fernando, California 91340-1822

818-898-2361 FAX 818-361-8095

## **CERTIFICATION OF SOURCE/DEVICE POSSESSION TRANSFER**

This document is to certify that on or about March 30, 2000, J.L. Shepherd and Associates took possession of and title to (1) Each Eberline Instrument Corporation Model 8150-XXXAB, with approximately \_\_\_\_\_\_ of Cesium-137(as of 1967), American Nuclear Type ANC 127 Source Capsule, from U.S. Army, Walter Reed Army Institute of Research; WRAMC. Basement of the Reactor Building, Forest Glen, MD 20907.

This transfer preparation took place under the direct supervision of J.L. Shepherd and Associates' engineer, under JLS&A'S State of California Radioactive Materials License and applicable 49CFR and CA Title 17 Transportation requirements, working under J.L. shepherd and Associates, State of California Radioactive Materials License 1777-19, Amendment 78, Expiration Date 10/11/95, with State of California issued Letter of Timely Renewal, Dated September 21, 1995, in accordance with 10CFR40.51, 49CFR, all regulatory agency licensing and transportation requirements. J.L. Shepherd and Associates per the attached license, or our designated hot cell facility, is licensed to receive, possess and store this source/device.

U.S. Army, Walter Reed Army Institute of Research

Dated: 29 Man 2000

Mary Shepherd Vice-President J.L. Shepherd and Associates Dated: 3/15/00

This is to acknowledge the receipt of your letter/application dated

includes an administrative review has been performed.

There were no administrative omissions. Your application was assigned to a technical reviewer. Please note that the technical review may identify additional omissions or require additional information.

Please provide to this office within 30 days of your receipt of this card

A copy of your action has been forwarded to our License Fee & Accounts Receivable Branch, who will contact you separately if there is a fee issue involved.

Your action has been assigned Mail Control Number <u>1 2 8 4 1</u>.6 When calling to inquire about this action, please refer to this control number. You may call us on (610) 337-5398, or 337-5260.

NRC FORM 532 (RI) (8-98) Sincerely, Licensing Assistance Team Leader



# UNITED STATES NUCLEAR REGULATORY COMMISSION REGION I

475 ALLENDALE ROAD KING OF PRUSSIA, PA 19406-1415

September 7, 2000

License No.

08-01738-02

Docket No. 03001317 Control No. 128416

Colonel Michael A. Dunn Commander Department of The Army Walter Reed Army Medical Center Washington, DC 20307-5001

SUBJECT: DEPARTMENT OF THE ARMY, ISSUANCE OF LICENSE AMENDMENT, CONTROL NO. 128416

Dear Colonel Dunn:

This refers to your license amendment request dated July 12, 2000. Enclosed with this letter is the amended license.

Please review the enclosed document carefully and be sure that you understand and fully implement all the conditions incorporated into the amended license. If there are any errors or questions, please notify the U.S. Nuclear Regulatory Commission, Region I Office, Licensing Assistance Team, (610) 337-5093 or 5239, so that we can provide appropriate corrections and answers.

Thank you for your cooperation.

Sincerely,

Original signed by Neelam Bhalla

Neelam Bhalla Health Physicist Nuclear Materials Safety Branch 1 Division of Nuclear Materials Safety

Enclosure: Amendment No. 72

CC:

Colonel William B. Johnson, Radiation Safety Officer Col. Eric Daxon, USACHPPM, 2050 Worth Road, Room 115 Fort Sam Houston, Texas 78234-6010 in accordance with the Freedom of Information Act, exemptions

# M. Dunn Department of The Army

 DOCUMENT NAME: G:\Docs\Current\Lic Cvr Letter\L08-01738-02.128416.wpd
 36957909

 To receive a copy of this document, indicate in the box: "C" = Copy w/o attach/encl "E" = Copy w/ attach/encl "N" = No copy
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OFFICIAL RECORD COPY

NRC FORM 374

U.S. NUCLEAR REGULATORY COMMISSION

PAGE

OF 6

Amendment No. 72

PAGES

Duplicate MATERIALS HICENSE )uplicate Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974 (Public Law 93-438), and Title 10, Code of Federal Regulations, Chapter I, Parts 30, 31, 32, 33, 34, 35, 36, 39, 40, and 70, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess, and transfer byproduct, source, and special nuclear material designated below; to use such material for the purpose(s) and at the place(s) designated below; to deliver or transfer such material to persons authorized to receive it in accordance with the regulations of the applicable Part(s). This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, as amended, and is subject to all applicable rules, regulations, and orders of the Nuclear Regulatory Commission now or hereafter in effect and to any conditions specified below.

| Licensee                             |                    | In accordance with the letter dated               |
|--------------------------------------|--------------------|---------------------------------------------------|
|                                      |                    | July 31, 2000,                                    |
| 1. Department of the Army            |                    | 3. License number 08-01738-02 is amended in       |
| Walter Reed Army Medical Center      | r (WRAMC)), 🖹 🗍    | its entirety to read as follows:                  |
|                                      |                    |                                                   |
| 2.                                   |                    | 4. Expiration date June 30, 2004                  |
| Washington, D.C. 20307-500           |                    | 5. Docket No. 030 01317                           |
|                                      |                    | Reference No.                                     |
|                                      | Marine Contractor  |                                                   |
| 6. Byproduct, source, and/or special | 7. Chemical and/or | physical form 8. Maximum amount that licensee may |
|                                      |                    |                                                   |
| A. Any byproduct material with       | AT Any             | A. 400 millicuries of each                        |
| atomic numbers 1-83                  |                    | radionuclide with a total                         |
|                                      |                    | possession nimit of zo curies                     |
| B. lodine 131                        | B <sub>2</sub> Any | B. 2 curies                                       |
| C. Xenon 133                         | C. Any             | Č. 2 curies                                       |
| D. Krypton 85                        | D. Any             | D. 1 curie                                        |
| E. Phosphorus 32                     | E. Any             | E. 2 curies                                       |
| F. Carbon 14                         | F. Any             | F. 2 curies                                       |
| G. lodine 125                        | G. Any             | G. 1 curie                                        |
| 'H. Iridium 192                      | H. Any             | н 1 5х2                                           |
| I. Chromium 51                       | I. Any             | I. 750 millicuries                                |
| J. Sulfur 35                         | J. Any             | J. 1 curie                                        |
| K. Hydrogen 3                        | K. Any             | K. 5 curies                                       |
| L. Molybdenum 99                     | L. Molybdenum      | 99/ L. 23 curies                                  |
| M. Technetium 99m                    | M. Any             | M. 23 curies                                      |
|                                      |                    |                                                   |



| NRC FORM 374A U.S. NL AR REGULATORY COMMISSION PAGE 3 of 6 PAGES                                                                                                                                                                                                                                                                                                                                                                                                       |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Duplicate Duplicate Duplicate Duplicate Duplicate Duplicate Duplicate Duplicate Duplicate Docket or Reference Number 030-01317                                                                                                                                                                                                                                                                                                                                         |
| Amendment No. 72                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 9. Authorized use:                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| A through CC Medical diagnosis, therapy and research in humans in accordance with any applicable                                                                                                                                                                                                                                                                                                                                                                       |
| Food and Drug Administration (FDA) requirements. Research and development as defined in 10 CFR 30.4, including animal studies; instrument calibration; student instruction                                                                                                                                                                                                                                                                                             |
| DD. Shielding in linear accelerators.                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| CONDITIONS                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <ol> <li>Licensed material may be used only at the licensee's facilities located at the Walter Reed Army Medical<br/>Center, Washington, D. C.; WRAMC Forest Glen Section and Annex, Silver Spring, Maryland; U.S. Army<br/>Medical Laboratory, WRAMC Department of Pathology, Fort Meade, Maryland; Rickman Building, 13 Taft<br/>Court, Rockville, Maryland and Gillette Building, 270 Research Center, 1413 Research Boulevard,<br/>Rockville, Maryland.</li> </ol> |
| 11. A. Licensed material shall be used by, or under the supervision of individuals designated in writing by<br>the Radiation Safety Committee. Colonel Dale K. Block, Chairperson. R. The use of licensed material in ar on humans shall be by a physician deptist, or pediatrict as defined.                                                                                                                                                                          |
| in 10 CFR 35.2.                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| C. Physicians, dentists, or podiatrists designated to use licensed material in or on humans shall meet the training criteria established in 10 CFR 35, Subpart J and shall be designated in writing by the licensee's Radiation Safety Committee.                                                                                                                                                                                                                      |
| D. The Radiation Safety Officer for this license is Colonel William B. Johnson.                                                                                                                                                                                                                                                                                                                                                                                        |
| 12. In addition to the possession limits in Item 8, the licensee shall further restrict the possession of licensed material at a single location to quantities below the limits specified in 10 CFR 30.72 which require consideration of the need for an emergency plan for responding to a release of licensed material.                                                                                                                                              |
| 13. Notwithstanding the requirements of 10 CFR 35.49(a) and (b), 35.100, 35.200, 35.300, 35.400 and 35.500 the licensee may use for any medical use any byproduct material or reagent kit. The licensee shall possess and use byproduct material for medical use in accordance with the prescriptive and performance criteria in the other sections of 10 CFR 35. This does not relieve the licensee from complying with                                               |
| applicable U.S. Food and Drug Administration (FDA) and other Federal and State requirements.                                                                                                                                                                                                                                                                                                                                                                           |
| 14. A. Detector cells containing a titanium tritide follor a scandium tritide foil shall-only be used at Conjunction with a properly operating temperature control mechanism which prevents the foil                                                                                                                                                                                                                                                                   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

| NRC | FORM                 | 374A                     |                                             | U.S. N                                         | L AR REG                                               | ULATORY COI                                                                    | MMISSION                                            |                                                                   |                                           | PAGE                                               | 4 of 6                                             | PAGES                                |
|-----|----------------------|--------------------------|---------------------------------------------|------------------------------------------------|--------------------------------------------------------|--------------------------------------------------------------------------------|-----------------------------------------------------|-------------------------------------------------------------------|-------------------------------------------|----------------------------------------------------|----------------------------------------------------|--------------------------------------|
|     |                      | Du                       |                                             | ate<br>TERIALS                                 |                                                        | Dur                                                                            | solica                                              | License Number<br>98=01738-02<br>Docket or Reference<br>030-01317 | 2<br>ence Num                             | De l                                               | licat                                              | <u>e</u>                             |
|     |                      |                          | SUP                                         | PLEMENT                                        | ARY SHEE                                               | <b>T</b> .                                                                     |                                                     | 000-01017                                                         |                                           |                                                    |                                                    |                                      |
|     |                      |                          |                                             |                                                |                                                        |                                                                                |                                                     | Amendment                                                         | INO. 7                                    | 2                                                  |                                                    |                                      |
|     |                      |                          | <u> </u>                                    | <u> </u>                                       |                                                        |                                                                                | <u> </u>                                            |                                                                   |                                           | <u></u>                                            |                                                    |                                      |
|     |                      |                          |                                             |                                                |                                                        |                                                                                |                                                     |                                                                   |                                           | c i                                                |                                                    |                                      |
|     |                      | temp<br>32.2             | eratures<br>10.                             | from exce                                      | eeding that                                            | specified ii                                                                   | n the cer                                           | lificate of reg                                                   | Istratio                                  | n reterred                                         | to in 10 C                                         | JFR                                  |
| ,   | B.                   | Whe<br>the o             | n in use,<br>outside.                       | detector of                                    | cells contai                                           | ning a titan                                                                   | ium tritid                                          | e foil or a sca                                                   | andium                                    | tritide foil                                       | shall be v                                         | vented to                            |
| 15. | The<br>devic<br>35.5 | licen:<br>ces c<br>00 ar | see shal<br>ontainin<br>nd every            | l conduct a<br>g licensed<br>six month         | a physical i<br>material re<br>s for all oth           | nventory ev<br>ceived and<br>ner sealed s                                      | very three<br>I possess<br>sources a                | e months to a<br>sed pursuant<br>and devices.                     | account<br>to 10 C                        | for all se<br>FR 35.59                             | aled sour<br>9, 35.400 a                           | ces and<br>and                       |
| 16. | <b>A</b> .           | Seale<br>conta<br>certif | ed sourc<br>aminatio<br>ficate of           | es and de<br>n at interv<br>registratio        | tector cells<br>als not to e<br>n referred t           | containing<br>xceed six n<br>o in 10 CFI                                       | licensed<br>nonths or<br>R 32.210                   | material sha<br>r at such othe<br>, not to excee                  | all be te<br>er interv<br>ed three        | sted for le<br>/als as are<br>e years.             | eakage an<br>e specified                           | ıd/or<br>d by the                    |
|     | B.                   | Notw<br>be te            | vithstand<br>ested for                      | ing Paragi<br>leakage a                        | raph A of th<br>nd/or conta                            | nis Conditio<br>amination a                                                    | n, sealec<br>t interval                             | I sources des<br>s not to exce                                    | signed<br>ed thre                         | to emit all<br>e months                            | oha partic                                         | les shall                            |
|     | <b>C.</b>            | In the<br>moni<br>be p   | e absend<br>ths prior<br>ut into us         | e of a cer<br>to the trar<br>se until tes      | tificate fror<br>nsfer, a sea<br>sted.                 | n a transfer<br>iled source                                                    | or indica<br>or detect                              | ting that a lea<br>lor cell receiv                                | ak test<br>ved fron                       | has been<br>n another                              | made wit<br>person sl                              | hin six<br>nall not                  |
|     | D.                   | Each<br>leaka            | n sealed<br>age, and                        | source fat<br>contamin                         | pricated by<br>ation prior                             | the license<br>to any use                                                      | e shall b<br>or transfe                             | e inspected a<br>er as a sealed                                   | and test                                  | ed for cor<br>e.                                   | nstruction                                         | defects,                             |
|     | E.                   | Seal                     | ed sourc                                    | es and de                                      | tector cells                                           | need not b                                                                     | oe leak te                                          | sted if:                                                          | . •                                       | · · · ·                                            |                                                    | :                                    |
|     | •                    | (i)                      | they co                                     | ntain only                                     | hydrogen-3                                             | 3; or                                                                          |                                                     |                                                                   |                                           | •<br>•                                             |                                                    |                                      |
|     | • •                  | (ii)                     | they co                                     | ntain only                                     | a radioacti                                            | ve gas; or                                                                     |                                                     | ·<br>·                                                            |                                           |                                                    |                                                    |                                      |
|     |                      | (iii)                    | the half                                    | -life of the                                   | isotope is                                             | 30 days or                                                                     | less; or                                            |                                                                   |                                           |                                                    |                                                    |                                      |
|     |                      | (iv)                     | they co<br>than 10                          | ntain not r<br>) microcuri                     | nore than<br>es of alpha                               | l00 microcu<br>emitting m                                                      | uries of b<br>aterial; o                            | eta and/or ga<br>r                                                | amma e                                    | mitting m                                          | aterial or                                         | not more                             |
|     |                      | (V)                      | they are<br>when the<br>tested we<br>sealed | e not designey are rem<br>within the source or | ned to em<br>moved fron<br>required lea<br>detector ce | it alpha par<br>n storage fo<br>ak test inter<br>ell shall be s<br>ntamination | ticles, are<br>or use or<br>val, they<br>stored for | e in storage,<br>transfer to ar<br>shall be test<br>a period of r | and are<br>nother p<br>ed befo<br>more th | e not bein<br>person, ar<br>re use or<br>an 10 yea | g used. H<br>nd have no<br>transfer.<br>ars withou | lowever,<br>ot been<br>No<br>t being |
|     | F.                   | DU<br>The                | test sha                                    | ate capat                                      |                                                        | ting the pre                                                                   |                                                     | te<br>0.005 micro                                                 | Curie of                                  | Dup<br>Fradioacti                                  |                                                    | ⊇<br>al on the                       |
| 1   |                      |                          |                                             | •                                              |                                                        |                                                                                |                                                     |                                                                   |                                           |                                                    |                                                    |                                      |

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| . NRC | FORM 374A                                                                                                            | U.S                                                                                                                              | . NU AR REGU                                                                                                                                      |                                                                                                                                       | SSION                                                                                                                 |                                                                                                                            | PAGE                                                                                                                                 | 5 of                                                                                 | 6                                                                            | PAGES                                                     |
|-------|----------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|------------------------------------------------------------------------------|-----------------------------------------------------------|
|       | Dupl                                                                                                                 | ICate<br>Materia<br>suppleme                                                                                                     | LS LICENSE                                                                                                                                        | Dupl                                                                                                                                  | C2 08=01<br>Docket<br>030-0                                                                                           | 738-02<br>or Reference N<br>1317                                                                                           |                                                                                                                                      | <u>)lic</u>                                                                          | ate                                                                          |                                                           |
|       | •                                                                                                                    | •                                                                                                                                |                                                                                                                                                   | 1                                                                                                                                     | Amer                                                                                                                  | idment No.                                                                                                                 | 72                                                                                                                                   |                                                                                      | <u> </u>                                                                     |                                                           |
|       |                                                                                                                      |                                                                                                                                  |                                                                                                                                                   |                                                                                                                                       | ·                                                                                                                     |                                                                                                                            | - <del>.</del> .                                                                                                                     |                                                                                      |                                                                              |                                                           |
|       | test sam<br>a report s<br>shall be i<br>accordar<br>leak test<br>Nuclear I<br>report sh<br>G. The licer<br>for leaka | ple. If the te<br>shall be filed<br>removed im<br>nee with Con<br>result is kno<br>Materials Sa<br>all specify t<br>nsee is auth | est reveals the<br>d with the U.S.<br>mediately from<br>mmission regul<br>own with the U<br>afety Branch, 4<br>he source or d<br>orized to collec | presence of (<br>Nuclear Regu<br>service and<br>lations. The r<br>S. Nuclear R<br>75 Allendale<br>etector cell in<br>ct leak test sat | 0.005 micro<br>ulatory Com<br>decontamin<br>eport shall I<br>egulatory C<br>Road, King<br>volved, the<br>mples for ar | curie or mo<br>mission an<br>ated, repair<br>be filed with<br>ommission,<br>of Prussia,<br>test results,<br>nalysis by the | re of remo<br>d the source<br>red, or disp<br>nin five day<br>, Region I,<br>Pennsylva<br>, and corre<br>ne licensee<br>cally licens | vable c<br>ce or de<br>osed c<br>s of the<br>ATTN:<br>nia 19<br>ctive ac<br>e. Alter | ontam<br>etector<br>f in<br>e date<br>Chief<br>406. 1<br>ction ta<br>nativel | ination,<br>cell<br>the<br>,<br>The<br>aken.<br>ly, tests |
|       | Commiss                                                                                                              | sion or an A                                                                                                                     | greement Stat                                                                                                                                     | e to perform s                                                                                                                        | such service                                                                                                          | sona apecini<br>ss.                                                                                                        | cally licens                                                                                                                         |                                                                                      |                                                                              |                                                           |
| 17.   | Sealed sourc<br>from source h                                                                                        | es or detect<br>nolders by th                                                                                                    | or cells contain<br>ne licensee.                                                                                                                  | ning licensed                                                                                                                         | material sha                                                                                                          | all not be of                                                                                                              | pened or so                                                                                                                          | ources                                                                               | remov                                                                        | ed                                                        |
| 18.   | The licensee<br>Sulfur 35, Co<br>provided:<br>A. Waste to                                                            | is authorize<br>balt 58, Iridi<br>be dispose                                                                                     | d to hold radio<br>um 192, Scand<br>d of in this ma                                                                                               | active materia<br>dium 46, for d<br>nner shall be                                                                                     | al with a phy<br>ecay-in-stor<br>held for dec                                                                         | vsical half-li<br>rage before<br>say a minim                                                                               | fe of less ti<br>disposal ir<br>um of ten l                                                                                          | nan 65<br>n ordina<br>half-live                                                      | days a<br>ary tras<br>es.                                                    | and<br>sh,                                                |
|       | B. Before d<br>appropri<br>determin<br>removed                                                                       | isposal as c<br>ate survey i<br>le that its ra<br>l or obliterat                                                                 | ordinary trash,<br>nstrument set o<br>dioactivity can<br>ed.                                                                                      | the waste sha<br>on its most se<br>not be distingi                                                                                    | III be survey<br>insitive scale<br>uished from                                                                        | ed at the co<br>e and with r<br>backgroun                                                                                  | ontainer su<br>no interpos<br>d. All radia                                                                                           | rface w<br>ed shie<br>ation la                                                       | vith the<br>elding t<br>bels sh                                              | o<br>nall be                                              |
|       | C. A record<br>years. T<br>placed ir<br>the dose<br>performe                                                         | of each such<br>he record n<br>h storage, th<br>rate measured the dispo                                                          | ch disposal per<br>nust include the<br>le radionuclide<br>ured at the surf<br>sal.                                                                | mitted under<br>e date of disp<br>s disposed, th<br>ace of each v                                                                     | this License<br>osal, the da<br>ne survey in<br>vaste contai                                                          | e Condition<br>te on which<br>strument us<br>ner, and the                                                                  | shall be re<br>the bypro<br>sed, the ba<br>e name of t                                                                               | tained<br>duct ma<br>ckgrou<br>the indi                                              | for thre<br>aterial<br>nd dos<br>vidual                                      | e<br>was<br>e rate,<br>who                                |
| 19.   | Experimental materials sha                                                                                           | animals, or<br>all not be us                                                                                                     | the products f<br>ed for human c                                                                                                                  | rom experime<br>consumption.                                                                                                          | ental animal                                                                                                          | s, that have                                                                                                               | been adm                                                                                                                             | ninister                                                                             | ed licer                                                                     | nsed                                                      |
| 20.   | The licensee<br>prescriptive a<br>35.100, 35.2                                                                       | shall posse<br>and perform<br>00, and 35.3                                                                                       | ss and use by<br>ance criteria in<br>300.                                                                                                         | oroduct mater<br>all sections o                                                                                                       | ial for huma<br>of 10 CFR P                                                                                           | in research<br>art 35 exce                                                                                                 | in accorda<br>pt sections                                                                                                            | nce wi<br>35.49(                                                                     | th the<br>(a) and                                                            | l (b),                                                    |
| 21.   | The-licensee<br>71,_"Packagi                                                                                         | is authorize                                                                                                                     | ed to transport<br>sportation of F                                                                                                                | licensed mate<br>Radioactive M                                                                                                        | aferial.Le                                                                                                            | rdance with                                                                                                                | the-provis                                                                                                                           | ions of                                                                              | ate                                                                          | R Part                                                    |
|       |                                                                                                                      |                                                                                                                                  |                                                                                                                                                   |                                                                                                                                       |                                                                                                                       |                                                                                                                            |                                                                                                                                      |                                                                                      |                                                                              |                                                           |

| NRC | FORM 374A                                                                                                                                                                                                                                                             | U.S. NL                                                                                                                                                                            | AR REGULAT                                                                                                        | ORY COMMISSION                                                                                   |                                                                                                               | PAGE                                                                | 6_of_6                                                                        | PAGES                            |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|-------------------------------------------------------------------------------|----------------------------------|
|     | Duplica<br>MAT<br>SUPP                                                                                                                                                                                                                                                | ERIALS L                                                                                                                                                                           | ICENSE<br>Y SHEET                                                                                                 | Duplica                                                                                          | License Number<br>98=01738-02<br>Docket or Reference Nu<br>030-01317                                          | Dun                                                                 | licate                                                                        |                                  |
|     |                                                                                                                                                                                                                                                                       |                                                                                                                                                                                    | ·                                                                                                                 |                                                                                                  | Amendment No.                                                                                                 | 72                                                                  | · · ·                                                                         |                                  |
|     | . <u></u>                                                                                                                                                                                                                                                             | ·                                                                                                                                                                                  |                                                                                                                   | ·                                                                                                |                                                                                                               |                                                                     |                                                                               |                                  |
| 22. | The licensee shall i<br>has been registered<br>equivalent regulation                                                                                                                                                                                                  | not acquire<br>d with the U<br>ons of an Ag                                                                                                                                        | licensed mai<br>.S. Nuclear l<br>greement Sta                                                                     | terial in a seale<br>Regulatory Con<br>ate.                                                      | d source or device<br>nmission pursuant                                                                       | unless the<br>to 10 CFR                                             | source or de 32.210 or                                                        | evice                            |
| 23. | Radioactive waste<br>procedures include<br>September 9, 1993                                                                                                                                                                                                          | generated s<br>d with the w<br>and Octob                                                                                                                                           | shall be store<br>/aste storage<br>er 29, 1993                                                                    | ed in accordanc<br>e plan described<br>F F F E C                                                 | e with the statemen<br>d in the licensee's l                                                                  | nts, repres<br>etter/appli                                          | entations, an<br>cation dated                                                 | ıd                               |
| 24. | Notwithstanding the<br>rooms used to hour<br>procedures contain                                                                                                                                                                                                       | e requireme<br>se radiopha<br>ed in the lef                                                                                                                                        | nts of 10 CF<br>rmaceutical<br>tters dated A                                                                      | R 35.315(a)(7),<br>therapy patients<br>pril 8, 1992 and                                          | the licensee may<br>s in accordance wit<br>November 24, 19                                                    | control cor<br>h the com<br>92.                                     | ntamination ir<br>mitments and                                                | ר<br>ב                           |
| 25. | Except as specifica<br>accordance with th<br>any enclosures, list<br>provided in 10 CFF<br>statements, repres-<br>restrictive than the<br>A. Application da<br>B. Letter dated S<br>C. Letter dated O<br>D. Letter dated D<br>E. Letter dated F<br>F. Letter dated Ju | Illy provided<br>e statement<br>ed below, e<br>35.31. The<br>entations, a<br>regulations.<br>ted January<br>eptember 9<br>ctober 29, 1<br>ecember 9,<br>ebruary 15,<br>une 2, 1994 | otherwise ir<br>s, represent<br>except for mir<br>e U.S. Nucle<br>nd procedur<br>21, 1993<br>1993<br>1993<br>1994 | n this license, th<br>ations, and pro-<br>nor changes in<br>ar Regulatory o<br>es in the license | e licensee shall co<br>cedures contained<br>the medical use rac<br>commission's regul<br>se's application and | nduct its p<br>in the doct<br>diation saf<br>ations sha<br>correspo | rogram in<br>uments, inclu<br>ety procedure<br>Il govern unle<br>ndence are n | ding<br>es as<br>ess the<br>nore |
|     | G. Letter dated D                                                                                                                                                                                                                                                     | ecember 6,                                                                                                                                                                         | 1996                                                                                                              | X - A                                                                                            |                                                                                                               | •                                                                   |                                                                               | . •                              |
| · · |                                                                                                                                                                                                                                                                       | · · ·                                                                                                                                                                              |                                                                                                                   | · · · ·                                                                                          |                                                                                                               | •<br>• •                                                            |                                                                               |                                  |
|     |                                                                                                                                                                                                                                                                       | •<br>•                                                                                                                                                                             |                                                                                                                   |                                                                                                  |                                                                                                               |                                                                     |                                                                               |                                  |
|     |                                                                                                                                                                                                                                                                       |                                                                                                                                                                                    | :<br>:                                                                                                            | For the U.S                                                                                      | S. Nuclear Regulato                                                                                           | ory Commi                                                           | ssion                                                                         |                                  |
| Da  | e <u>September 7.</u>                                                                                                                                                                                                                                                 | 2000                                                                                                                                                                               | ·                                                                                                                 | <b>Ori</b><br>By                                                                                 | ginal signed by N                                                                                             | eelam Bha                                                           | alla                                                                          | . *                              |
|     | Duplica                                                                                                                                                                                                                                                               | ıte                                                                                                                                                                                |                                                                                                                   |                                                                                                  | elam Bhalla<br>Ilear Materials Safe<br>sion of Nuclear Ma<br>ion I<br>of Prussia, Penns                       | ety Branch<br>terials Saf<br>DUD<br>sylvania 19                     | 1<br>ety<br>licate                                                            |                                  |
|     |                                                                                                                                                                                                                                                                       |                                                                                                                                                                                    |                                                                                                                   | · · ·                                                                                            |                                                                                                               |                                                                     |                                                                               |                                  |
|     |                                                                                                                                                                                                                                                                       |                                                                                                                                                                                    |                                                                                                                   |                                                                                                  |                                                                                                               |                                                                     |                                                                               |                                  |



DEPARTMENT OF THE ARMY WALTER REED ARMY MEDICAL CENTER WALTER REED HEALTH CARE SYSTEM WASHINGTON, DC 20307-5001

April 12, 2001

## RECEIVED REGION 1

2001 APR 19 PM 4:27 NMS61

Preventive Medicine Service

030-01317

Nuclear Regulatory Commission, Region I Medical Licensing Division 475 Allendale Road King of Prussia, Pennsylvania 19406-1415

Dear Sir or Madam:

Walter Reed Army Medical Center uses radioactive material authorized by U.S. Nuclear Regulatory Commission (NRC) Byproduct Material License number 08-01738-02 with an expiration date of June 30, 2004.

We request to amend NRC License 08-1738-02 to increase the maximum possession limit of  $^{192}$ Ir in section 8H to  $^{100}$ . This  $F_{\rm M}$  increase in the maximum possession limit is to allow for the addition of Intravascular Brachytherapy procedures. The procedures will initially utilize the Cordis Checkmate system. Standard Operating Procedures will be developed and approved by the Radiation Control Committee prior to implementation of this procedure.

We also request to amend NRC License 08-1738-02 to increase the maximum possession limit  $^{153}$ Gd in section 8P to 2 curies per camera. This will allow for additional cameras in Nuclear Medicine.

For any additional information, please contact the undersigned at (202) 356-0058.

Sincerely,

(Johnson

Colonel, U.S. Army Radiation Protection Officer

Copy Furnish:

Director, Proponency Office for Preventive Medicine - San Antonio, ATTN: MCPO-SA (COL Daxon), 2050 Worth Road, Ft. Sam Houston, TX 78234-6000

Information in this record was deleted In accordance with the Freedom of Information

Act. exemptions\_ FDIA 2006-023

1. 1. 191 J.

NMSS/RGN MATERIALS-002

129603

OHT 60092

This is to acknowledge the receipt of your letter/application dated

<u>*Hirles*</u>, and to inform you that the initial processing which includes an administrative review has been performed.

AMOND. 08-01738-02

There were no administrative omissions. Your application was assigned to a technical reviewer. Please note that the technical review may identify additional omissions or require additional information.

Please provide to this office within 30 days of your receipt of this card

A copy of your action has been forwarded to our License Fee & Accounts Receivable Branch, who will contact you separately if there is a fee issue involved.

Your action has been assigned Mail Control Number <u>129603</u> When calling to inquire about this action, please refer to this control number. You may call us on (610) 337-5398, or 337-5260.

NRC FORM 532 (RI) (6-96) Sincerely, Licensing Assistance Team Leader

|                                    | : (FOR LFMS USE)                     |
|------------------------------------|--------------------------------------|
| · ·                                | : INFORMATION FROM LTS               |
| BETWEEN:                           |                                      |
|                                    | :                                    |
| License Fee Management Branch, ARM | : ProgramCode: 02110                 |
| and                                | : Status Code: 0                     |
| Regional Licensing Sections        | : Fee Category: EX 7B                |
| · ·                                | : Exp. Date: 20040630                |
|                                    | : Fee Comments: 2B AND 2C PART OF 7B |
|                                    | : Decom Fin Assur Reqd: Y            |
|                                    |                                      |

#### LICENSE FEE TRANSMITTAL

A. REGION I

| 1. | APPLICATION ATTACHED |                         |    |
|----|----------------------|-------------------------|----|
|    | Applicant/Licensee:  | ARMY, DEPARTMENT OF THE | ŗ, |
|    | Received Date:       | 20010419                |    |
|    | Docket No:           | 3001317                 |    |
|    | Control No.:         | 129603                  |    |
|    | License No.:         | 08-01738-02             |    |
|    | Action Type:         | Amendment               |    |

2. FEE ATTACHED Amount: Check No.:

3. COMMENTS

Signed M. a. Perkins Date 4/25/201

B. LICENSE FEE MANAGEMENT BRANCH (Check when milestone 03 is entered / \_/)

1. Fee Category and Amount:

2. Correct Fee Paid. Application may be processed for: Amendment Renewal

License 3. OTHER

Signed \_\_\_\_\_ Date \_\_\_\_\_



#### UNITED STATES NUCLEAR REG JLATORY COMMISSION REGION I 475 ALLENDALE ROAD KING OF PRUSSIA, PENNSYLVANIA 19406-1415

June 14, 2001

Docket No. 03001317 Control No. 129603 License No.

08-01738-02

Colonel William B. Johnson Radiation Protection Officer Department of the Army Walter Reed Army Medical Center MCHL-HP/ Health Physics Office Building 41, Room 38 Washington, DC 20307-5001

SUBJECT: DEPARTMENT OF THE ARMY, ISSUANCE OF LICENSE AMENDMENT, CONTROL NO. 129603

Dear COL. Johnson:

This refers to your license amendment request. Enclosed with this letter is the amended license.

Please note that: i) iridium-192, in the form of sealed sources, has been added to your license under Item 6.DD; ii) the gadolinium-153 possession limit has been increased to 6 curies; and iii) Item 11.D. has been added to your license to allow the approval of medical physicists, to support your intravascular brachytherapy program, by your radiation protection committee. Please review the enclosed document carefully and be sure that you understand and fully implement all the conditions incorporated into the amended license. If there are any errors or questions, please notify the U.S. Nuclear Regulatory Commission, Region I Office, Licensing Assistance Team, (610) 337-5239, so that we can provide appropriate corrections and answers.

In accordance with 10 CFR 2.790, a copy of this letter will be placed in the NRC Public Document Room and will be accessible from the NRC Web site at <u>http://www.nrc.gov/NRC/ADAMS/index.html.</u>

165050

Thank you for your cooperation.

information in this record was deleted in accordance with the Freedom of Information

Act, exemptions FOIA- 2006-00

Enclosure: Amendment No. 73 Sincerely.

Original signed by Penny Lanzisera

Senior Health Physicist Nuclear Materials Safety Branch 1 Division of Nuclear Materials Safety

W. Johnson Department of the Army

cc:

Director, Proponency Office For Preventive Medicine - San Antonio ATTN: MCPO-SA (COL. Daxon) 2050 Worth Road Ft. Sam Houston, TX 78234-6000 W. Johnson Department of the Army

DOCUMENT NAME: G:\Docs\Current\Lic Cvr Letter\L08-01738-02.129603.wpd To receive a copy of this document, indicate in the box: "C" = Copy w/o attach/encl "E" = Copy w/ attach/encl "N" = No copy

64943171

| OFFICE | DNMS/RI       | Ν | DNMS/RI | DNMS/RI |        |  |
|--------|---------------|---|---------|---------|--------|--|
| NAME   | PLanzisera PL |   |         |         | 29<br> |  |
| DATE   | 6/14/01       |   |         |         |        |  |

OFFICIAL RECORD COPY

NRC FORM 374

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U.S. NUCLEAR REGULATORY COMMISSION

PAGE <u>1</u> OF <u>6</u> PAGES Amendment No. 73

120

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|                                                                                                                                                                                                                                                                                                                                                                                   | MATERIALS                                                                                                                                                                                     | LICENSE                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                            |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Pursuant to the Atomic Energy Act of 1954, as a<br>of Federal Regulations, Chapter I, Parts 30, 3<br>heretofore made by the licensee, a license is he<br>source, and special nuclear material designate<br>deliver or transfer such material to persons author<br>shall be deemed to contain the conditions special<br>applicable rules, regulations, and orders of the<br>below. | amended, the Energy R<br>1, 32, 33, 34, 35, 36, 3<br>preby issued authorizing<br>d below; to use such ma<br>orized to receive it in acc<br>cified in Section 183 of<br>Nuclear Regulatory Cor | eorganization Act of 197<br>9, 40, and 70, and in rel<br>the licensee to receive,<br>aterial for the purpose(s)<br>cordance with the regulat<br>the Atomic Energy Act o<br>nmission now or hereafte | 4 (Public Law 93-438), and Title 10, Code<br>iance on statements and representations<br>acquire, possess, and transfer byproduct,<br>and at the place(s) designated below; to<br>ions of the applicable Part(s). This license<br>f 1954, as amended, and is subject to all<br>er in effect and to any conditions specified |
| Licensee                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                               | In accordance with                                                                                                                                                                                  | the letter dated                                                                                                                                                                                                                                                                                                           |
|                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                               | April 12, 2001,                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                            |
| 1. Department of the Army                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                               | 3. License number 08                                                                                                                                                                                | -01738-02 is amended in                                                                                                                                                                                                                                                                                                    |
| Walter Reed Army Medical Center (                                                                                                                                                                                                                                                                                                                                                 | WRAMC)                                                                                                                                                                                        | its entirety to read                                                                                                                                                                                | as follows:                                                                                                                                                                                                                                                                                                                |
| 2. Washington, D.C. 20307-5001                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                               | 4. Expiration date Jur                                                                                                                                                                              | ne 30, 2004                                                                                                                                                                                                                                                                                                                |
|                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                               | 5. Docket No. 030-0                                                                                                                                                                                 | 1317                                                                                                                                                                                                                                                                                                                       |
|                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                               | Reference No.                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                            |
|                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                               |                                                                                                                                                                                                     | * · · · · · · · · · · · · · · · · · · ·                                                                                                                                                                                                                                                                                    |
| <ol> <li>Byproduct, source, and/or special<br/>nuclear material</li> </ol>                                                                                                                                                                                                                                                                                                        | 7. Chemical and/or p                                                                                                                                                                          | bysical form 8.                                                                                                                                                                                     | Maximum amount that licensee may<br>possess at any one time under this<br>license                                                                                                                                                                                                                                          |
| <ul> <li>A. Any byproduct material with atomic numbers 1-83</li> <li>B. Iodine 131</li> </ul>                                                                                                                                                                                                                                                                                     | A. Any<br>B. Any                                                                                                                                                                              | B                                                                                                                                                                                                   | 400 millicuries of each<br>radionuclide with a total<br>possession limit of 26 curies<br>2 curies                                                                                                                                                                                                                          |
| C. Xenon 133                                                                                                                                                                                                                                                                                                                                                                      | C. Any                                                                                                                                                                                        | ć                                                                                                                                                                                                   | 2 curies                                                                                                                                                                                                                                                                                                                   |
| D. Krypton 85                                                                                                                                                                                                                                                                                                                                                                     | D. Any                                                                                                                                                                                        | D                                                                                                                                                                                                   | 1 curie                                                                                                                                                                                                                                                                                                                    |
| E. Phosphorus 32                                                                                                                                                                                                                                                                                                                                                                  | E. Any                                                                                                                                                                                        | E                                                                                                                                                                                                   | 2 curies                                                                                                                                                                                                                                                                                                                   |
| F. Carbon 14                                                                                                                                                                                                                                                                                                                                                                      | F. Any                                                                                                                                                                                        | F                                                                                                                                                                                                   | 2 curies                                                                                                                                                                                                                                                                                                                   |
| G. lodine 125                                                                                                                                                                                                                                                                                                                                                                     | G. Any                                                                                                                                                                                        | G                                                                                                                                                                                                   | . 1 curie                                                                                                                                                                                                                                                                                                                  |
| · H. Iridium 192                                                                                                                                                                                                                                                                                                                                                                  | H. Any                                                                                                                                                                                        | Н                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                            |
| I. Chromium 51                                                                                                                                                                                                                                                                                                                                                                    | I. Any                                                                                                                                                                                        | н <sup>т</sup> . <b>І.</b>                                                                                                                                                                          | 750 millicuries                                                                                                                                                                                                                                                                                                            |
| J. Sulfur 35                                                                                                                                                                                                                                                                                                                                                                      | J. Any                                                                                                                                                                                        | J.                                                                                                                                                                                                  | 1 curie                                                                                                                                                                                                                                                                                                                    |
| K. Hydrogen 3                                                                                                                                                                                                                                                                                                                                                                     | K. Any                                                                                                                                                                                        | K                                                                                                                                                                                                   | . 5 curies                                                                                                                                                                                                                                                                                                                 |
| L. Molybdenum 99                                                                                                                                                                                                                                                                                                                                                                  | L. Molybdenum 9<br>Technetium 99                                                                                                                                                              | 9/ L.<br>9m Generators                                                                                                                                                                              | 23 curies                                                                                                                                                                                                                                                                                                                  |
| M. Technetium 99m                                                                                                                                                                                                                                                                                                                                                                 | M. Any                                                                                                                                                                                        | M                                                                                                                                                                                                   | . 23 curies                                                                                                                                                                                                                                                                                                                |



| NRC FURWI STAA                   | U.J. N                                                       |                                                                                       | License Number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                |
|----------------------------------|--------------------------------------------------------------|---------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
|                                  |                                                              |                                                                                       | 08-01738-02                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                |
| · ·                              |                                                              |                                                                                       | Docket or Reference Number<br>030-01317                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                |
|                                  |                                                              |                                                                                       | Amendment No. 73                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                |
|                                  |                                                              | · · ·                                                                                 | Amendment No. 75                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                |
|                                  | ·                                                            |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                |
| · · · ·                          |                                                              |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                |
| 9. Authorized us                 | se:                                                          |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                |
| A. through DD.                   | Medical diag<br>Food and Dr<br>defined in 10<br>instruction. | nosis, therapy and researc<br>ug Administration (FDA) re<br>CFR 30.4, including anima | n in humans in accordance with any<br>quirements. Research and develop<br>Il studies; instrument calibration; stu                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | applicable<br>ment as<br>ident |
| EE. Shielding in I               | inear accelerator                                            | s. 🔔 🔬 📮 📮 🚝 /                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                |
|                                  | · · · ·                                                      |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                |
|                                  |                                                              | CONDITIONS                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | : .                            |
| 10. Licensed ma                  | terial may be use                                            | d only at the licensee's faci                                                         | lities located at the Walter Reed Arm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | ny Medical                     |
| Center, Wasl                     | nington, D. C., W                                            | RAMC Forest Glen Section                                                              | and Annex, Silver Spring, Maryland                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | ; U.S. Army                    |
| Medical Labo                     | oratory, WRAMC                                               | Department of Pathology, H                                                            | ort Meade, Maryland; Rickman Build                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | ding, 13 Taft                  |
| Court, Rockv                     | ille, Maryland and                                           | a Gillette Bullaing, 270 Res                                                          | earch Genter, 1413 Research Boule                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | vard,                          |
|                                  |                                                              |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | · .                            |
| 11. A. Licensed<br>the Radi      | d material shall be<br>ation Safety Corr                     | e used by, or under the sup<br>nmittee, Colonel Dale K. Bic                           | ervision of, individuals designated in<br>ck, Chairperson.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | writing by                     |
| B. The use<br>in 10 CF           | of licensed mate<br>R 35.2.                                  | rial in or on humans shall b                                                          | e by a physician, dentist, or podiatris                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | st as defined                  |
|                                  | ×°.                                                          |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                |
| C. Physicia                      | ns, dentists, or p                                           | odiatrists designated to use                                                          | licensed material in or on humans s                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | shall meet the                 |
| training                         | criteria establishe                                          | ed in 10 CFR 35, Subpart J                                                            | and shall be designated in writing by                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | / the                          |
| licensee                         | 's Radiation Safe                                            | ety Committee.                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                |
| D. Individu                      | als designated to                                            | work as medical physicists                                                            | for intravascular brachytherapy shal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | I meet the                     |
| training                         | and experience c                                             | riteria established in 10 CF                                                          | R 35.961; or be named on a current                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | U.S. Nuclear                   |
| Regulate                         | ory Commission                                               | or Agreement State license,                                                           | or a permit issued under a broad so                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | ope license                    |
| as a me                          | dical physicist; ar                                          | nd shall be designated, in w                                                          | riting, by the Radiation Safety Commission and the Radiation and | littee. In                     |
| addition                         | , the physicist mu                                           | ist meet the recentness of the                                                        | anning requirement in TOCER 55.97                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                |
| brachyth                         | perany device use                                            | alling and experience for ea                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                |
| J Diacityti                      | iorupy dovide dat                                            |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                |
| E. The Rad                       | liation Safety Off                                           | icer for this license is Colon                                                        | el William B. Johnson.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                |
| 12. In addition to material at a | the possession l<br>single location to                       | limits in Item 8, the licensee<br>quantities below the limits                         | shall further restrict the possession specified in 10 CFR 30.72 which req                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | of licensed<br>uire            |
| consideratio                     | n of the need for                                            | an emergency plan for resp                                                            | onding to a release of licensed mate                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | rial.                          |
|                                  |                                                              |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                |
|                                  |                                                              |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                |
|                                  |                                                              | · · · · · · · · · · · · · · · · · · ·                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | •<br>•                         |

| NRC FORM 374A U.S. N FAR REGULATORY COMMISSION                                                                                                                                                                                                                                                               | PAGE 4 of 6 PAGES                                                                                                                                                                                                                       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                                                                                                                                                              | License Number<br>08-01738-02                                                                                                                                                                                                           |
| MATERIALS LICENSE<br>SUPPLEMENTARY SHEET                                                                                                                                                                                                                                                                     | Docket or Reference Number<br>030-01317                                                                                                                                                                                                 |
|                                                                                                                                                                                                                                                                                                              | Amendment No. 73                                                                                                                                                                                                                        |
|                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                         |
| 13. Notwithstanding the requirements of 10 CFR 35.49(a) and<br>the licensee may use for any medical use any byproduct of<br>possess and use byproduct material for medical use in ac<br>criteria in the other sections of 10 CFR 35. This does not<br>applicable U.S. Food and Drug Administration (FDA) and | d (b), 35.100, 35.200, 35.300, 35.400 and 35.500<br>material or reagent kit. The licensee shall<br>coordance with the prescriptive and performance<br>relieve the licensee from complying with<br>other Federal and State requirements. |
| 14. A. Detector cells containing a titanium tritide foil or a sc<br>conjunction with a properly operating temperature co<br>temperatures from exceeding that specified in the ce<br>32.210.                                                                                                                  | andium tritide foil shall only be used in<br>ntrol mechanism which prevents the foil<br>rtificate of registration referred to in 10 CFR                                                                                                 |
| <ul> <li>B. When in use, detector cells containing a titanium tritic the outside.</li> </ul>                                                                                                                                                                                                                 | de foil or a scandium tritide foil shall be vented to                                                                                                                                                                                   |
| 15. The licensee shall conduct a physical inventory every three devices containing licensed material received and posses 35.500 and every six months for all other sealed sources                                                                                                                            | ee months to account for all sealed sources and<br>sed pursuant to 10 CFR 35.59, 35.400 and<br>and devices.                                                                                                                             |
| <ol> <li>A. Sealed sources and detector cells containing license<br/>contamination at intervals not to exceed six months<br/>certificate of registration referred to in 10 CFR 32.21</li> <li>B. Notwithstanding Paragraph A of this Condition, seale</li> </ol>                                             | d material shall be tested for leakage and/or<br>or at such other intervals as are specified by the<br>0, not to exceed three years.                                                                                                    |
| be tested for leakage and/or contamination at interva                                                                                                                                                                                                                                                        | als not to exceed three months.                                                                                                                                                                                                         |
| C. In the absence of a certificate from a transferor indic<br>months prior to the transfer, a sealed source or detection<br>be put into use until tested.                                                                                                                                                    | ating that a leak test has been made within six<br>ctor cell received from another person shall not                                                                                                                                     |
| D. Each sealed source fabricated by the licensee shall l<br>leakage, and contamination prior to any use or trans                                                                                                                                                                                             | be inspected and tested for construction defects,<br>fer as a sealed source.                                                                                                                                                            |
| E. Sealed sources and detector cells need not be leak t                                                                                                                                                                                                                                                      | ested if:                                                                                                                                                                                                                               |
| (i) they contain only hydrogen-3; or                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                         |
| (ii) they contain only a radioactive gas; or                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                         |
| (iii) the half-life of the isotope is 30 days or less, or                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                         |
| <ul> <li>(iv) they contain not more than 100 microcuries of<br/>than 10 microcuries of alpha emitting material;</li> </ul>                                                                                                                                                                                   | beta and/or gamma emitting material or not more<br>or                                                                                                                                                                                   |
|                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                         |

| INC I PRIM 374A                          | U.S. N LAN NEODER ON                                                    | COMMISSION                                     |                                               | *                                 | FAGE                  | 5              | 01 0             | FA              | 363        |
|------------------------------------------|-------------------------------------------------------------------------|------------------------------------------------|-----------------------------------------------|-----------------------------------|-----------------------|----------------|------------------|-----------------|------------|
| •                                        | · .                                                                     | •                                              | License Numb<br>08-01738-                     | 02                                |                       |                |                  |                 |            |
| MATERIALS LICENSE<br>SUPPLEMENTARY SHEET |                                                                         | Docket or Reference Number<br>030-01317        |                                               |                                   |                       |                |                  | <u> </u>        |            |
|                                          | Amendme                                                                 | nt No. 7                                       | ′3                                            |                                   |                       |                |                  |                 |            |
| (v) th<br>w<br>te                        | ney are not designed to emit alpha<br>then they are removed from storag | particles, ar<br>e for use or<br>nterval, they | e in storage<br>transfer to a<br>shall be tes | e, and ar<br>another<br>sted befo | e not be<br>person, a | ing u<br>and h | sed. F<br>ave no | lowev<br>ot bee | /er,<br>en |
| S                                        | ealed source or detector cell shall l                                   | be stored for                                  | a period of                                   | f more th                         | nan 10 y              | ears           | without          | t bein          | g.         |

tested for leakage and/or contamination.

ATORY COMMISSION

- F. The test shall be capable of detecting the presence of 0.005 microcurie of radioactive material on the test sample. If the test reveals the presence of 0.005 microcurie or more of removable contamination, a report shall be filed with the U.S. Nuclear Regulatory Commission and the source or detector cell shall be removed immediately from service and decontaminated, repaired, or disposed of in accordance with Commission regulations. The report shall be filed within five days of the date the leak test result is known with the U.S. Nuclear Regulatory Commission, Region I, ATTN: Chief, Nuclear Materials Safety Branch, 475 Allendale Road, King of Prussia, Pennsylvania 19406. The report shall specify the source or detector cell involved, the test results, and corrective action taken.
- G. The licensee is authorized to collect leak test samples for analysis by the licensee. Alternatively, tests for leakage and/or contamination may be performed by persons specifically licensed by the Commission or an Agreement State to perform such services.
- 17. Sealed sources or detector cells containing licensed material shall not be opened or sources removed from source holders by the licensee
- 18. The licensee is authorized to hold radioactive material with a physical half-life of less than 65 days and Sulfur 35, Cobalt 58, Iridium 192, Scandium 46, for decay-in-storage before disposal in ordinary trash, provided:

A. Waste to be disposed of in this manner shall be held for decay a minimum of ten half-lives.

B. Before disposal as ordinary trash, the waste shall be surveyed at the container surface with the appropriate survey instrument set on its most sensitive scale and with no interposed shielding to determine that its radioactivity cannot be distinguished from background. All radiation labels shall be removed or obliterated.

- C. A record of each such disposal permitted under this License Condition shall be retained for three years. The record must include the date of disposal, the date on which the byproduct material was placed in storage, the radionuclides disposed, the survey instrument used, the background dose rate, the dose rate measured at the surface of each waste container, and the name of the individual who performed the disposal.
- 19. The licensee shall possess and use byproduct material for human research in accordance with the prescriptive and performance criteria in all sections of 10 CFR Part 35 except sections 35.49(a) and (b), 35.100, 35.200, and 35.300.

| NRC FORM 374A U.S. N EAR REGULATORY COMMISSION                                                                                                                                              | PAGE 6 of 6 PAGES                                                                                                                           |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                                             | License Number<br>08-01738-02                                                                                                               |
| MATERIALS LICENSE<br>SUPPLEMENTARY SHEET                                                                                                                                                    | Docket or Reference Number<br>030-01317                                                                                                     |
|                                                                                                                                                                                             | Amendment No. 73                                                                                                                            |
|                                                                                                                                                                                             |                                                                                                                                             |
| 20. Experimental animals, or the products from experimental a materials shall not be used for human consumption.                                                                            | animals, that have been administered licensed                                                                                               |
| <ol> <li>The licensee is authorized to transport licensed material in<br/>71, "Packaging and Transportation of Radioactive Materia</li> </ol>                                               | n accordance with the provisions of 10 CFR Part<br>I."                                                                                      |
| 22. The licensee shall not acquire licensed material in a seale has been registered with the U.S. Nuclear Regulatory Cor equivalent regulations of an Agreement State.                      | d source or device unless the source or device<br>nmission pursuant to 10 CFR 32.210 or                                                     |
| <ol> <li>Radioactive waste generated shall be stored in accordance<br/>procedures included with the waste storage plan described<br/>September 9, 1993 and October 29, 1993.</li> </ol>     | e with the statements, representations, and<br>d in the licensee's letter/application dated                                                 |
| 24. Notwithstanding the requirements of 10 CFR 35.315(a)(7) rooms used to house radiopharmaceutical therapy patient procedures contained in the letters dated April 8, 1992 and             | , the licensee may control contamination in<br>s in accordance with the commitments and<br>d November 24, 1992.                             |
| 25. Except as specifically provided otherwise in this license, th<br>accordance with the statements, representations, and pro-<br>any enclosures, listed below, except for minor changes in | ne licensee shall conduct its program in<br>cedures contained in the documents, including<br>the medical use radiation safety procedures as |
| provided in 10 CFR 35.31. The U.S. Nuclear Regulatory of statements, representations, and procedures in the license restrictive than the regulations.                                       | Commission's regulations shall govern unless the<br>ee's application and correspondence are more                                            |
| <ul> <li>A. Application dated January 21, 1993</li> <li>B. Letter dated September 9, 1993</li> </ul>                                                                                        |                                                                                                                                             |
| C. Letter dated October 29, 1993                                                                                                                                                            |                                                                                                                                             |
| D. Letter dated December 9, 1993                                                                                                                                                            |                                                                                                                                             |
| E. Letter dated February 15, 1994                                                                                                                                                           |                                                                                                                                             |
| F. Letter dated June 2, 1994                                                                                                                                                                |                                                                                                                                             |
| G. Letter dated December 6, 1996                                                                                                                                                            |                                                                                                                                             |
| For the U.S                                                                                                                                                                                 | 5. Nuclear Regulatory Commission                                                                                                            |
|                                                                                                                                                                                             |                                                                                                                                             |
| Ori                                                                                                                                                                                         | ginal signed by Penny Lanzisera                                                                                                             |
| Date <u>June 13, 2001</u> By                                                                                                                                                                |                                                                                                                                             |
| Per                                                                                                                                                                                         | ny Lanzisera                                                                                                                                |
| Nuc                                                                                                                                                                                         | clear Materials Safety Branch 1                                                                                                             |
| Div                                                                                                                                                                                         | Ision of Nuclear Materials Safety                                                                                                           |
| Reg                                                                                                                                                                                         | gion I<br>a of Druppio, Domastrania 40400                                                                                                   |
| Kin                                                                                                                                                                                         | g ot Prussia, Pennsylvania 19406                                                                                                            |
|                                                                                                                                                                                             | · · · · · · · · · · · · · · · · · · ·                                                                                                       |
|                                                                                                                                                                                             |                                                                                                                                             |

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DEPARTMENT OF THE ARMY WALTER REED ARMY MEDICAL CENTER WALTER REED HEALTH CARE SYSTEM WASHINGTON, DC 20307-5001 19 July 2002 RECEIVED Region 1

2007 JUL 25 PM 2: 17

REPLY TO ATTENTION OF

Preventive Medicine Service

030-01317 030-06895

Nuclear Regulatory Commission, Region I Medical Licensing Division 475 Allendale Road King of Prussia, Pennsylvania 19406-1415

#### Dear Sir or Madam:

Walter Reed Army Medical Center uses radioactive material authorized by U.S. Nuclear Regulatory Commission (NRC) Byproduct Material License number 08-01738-02 with an expiration date of June 30, 2004 and Irradiator License number 08-1738-03 with an expiration date of November 30, 2011.

We request to change the Radiation Safety Officer (RSO) on both of the above licenses to Lieutenant Colonel John R. Mercier with an effective date of 15 August 2002. LTC Mercier's CV and NRC Form 313 are enclosed. LTC Mercier previously served for 4 years as the PSO on a Type A Broad Scope License (#53-00458-04) at Tripler Army Medical Center.

For any additional information, please contact the undersigned at (202) 356-0058.

Sincerely,

hnson, Ph.D.

Radiation Safety Officer

NMSS/RONI MATERIALS-002

NMSB2

1859

m1099/1709 249

Copy Furnish: Director, Proponency Office for Preventive Medicine - San Antonio, ATTN: MCPO-SA (COL Daxon), 2050 Worth Road, Ft. Sam Houston, TX 78234-6000

Information in this record was deleted in accordance with the Freedom of Information Act, exemptions 6-0338 F01A- \_\_

|                                                                                                                                                                   | NRC Form 313                                                                                                                            | A _ LTC John Merci | er, Ph.D., May 2002 |  |  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|--------------------|---------------------|--|--|
| NRC FORM 313A<br>(8-1999)                                                                                                                                         | IRC FORM 313A U.S. NUCLEAR REGULATORY COMMISSION 3-1999)                                                                                |                    |                     |  |  |
| TRAINING AND EXPERIENCE                                                                                                                                           |                                                                                                                                         |                    |                     |  |  |
| <b>Note:</b> Descriptions of training and experience must contain sufficient detail to match the training and experience criteria in the application regulations. |                                                                                                                                         |                    |                     |  |  |
| 1. Name of Individual, Proposed Author<br>(e.g., 10CFR 35.50)                                                                                                     | 1. Name of Individual, Proposed Authorization (e.g. Radiation Safety Officer), and Applicable Training Requirements (e.g., 10CFR 35.50) |                    |                     |  |  |
|                                                                                                                                                                   |                                                                                                                                         | :                  |                     |  |  |
| ETC JOHN R. MERCIER, PI                                                                                                                                           | 1.D., FE, DABK                                                                                                                          |                    |                     |  |  |
|                                                                                                                                                                   |                                                                                                                                         |                    |                     |  |  |
| 2. For Physicians, State or Territory Wh                                                                                                                          | ere Licensed                                                                                                                            |                    |                     |  |  |
|                                                                                                                                                                   | ·                                                                                                                                       |                    |                     |  |  |
|                                                                                                                                                                   |                                                                                                                                         |                    |                     |  |  |
|                                                                                                                                                                   |                                                                                                                                         |                    |                     |  |  |
| Specialty Board                                                                                                                                                   | 3. CERTIFICATION<br>Category                                                                                                            | Month and Y        | ear Certified       |  |  |
|                                                                                                                                                                   | category                                                                                                                                | Montin and I       |                     |  |  |
| American Board of Radiology                                                                                                                                       | Diagnostic Radiological and<br>Medical Nuclear Physics                                                                                  | June, 1995         |                     |  |  |
| Professional Engineer (Texas)                                                                                                                                     | Nuclear Engineering License                                                                                                             | March, 1995        |                     |  |  |
|                                                                                                                                                                   | 4. DIDACTIC TRAINING                                                                                                                    | L                  |                     |  |  |
| Description of Training                                                                                                                                           | Location                                                                                                                                | Clock Hours        | Dates of Training   |  |  |
|                                                                                                                                                                   | University of Texas at Austin                                                                                                           | 300                | Sep 81 – Dec 84     |  |  |
| Radiation Physics and Instrumentation                                                                                                                             | Cornell University, NY                                                                                                                  | 300                | Aug 89 – May 91     |  |  |
|                                                                                                                                                                   | Univ. of Texas Health Science Center                                                                                                    | 550                | Aug 96 – Aug 99     |  |  |
|                                                                                                                                                                   | University of Texas at Austin                                                                                                           | 50                 | Sep 81 – Dec 84     |  |  |
| Radiation Protection                                                                                                                                              | Cornell University, NY                                                                                                                  | 100                | Aug 89 – May 91     |  |  |
|                                                                                                                                                                   | Univ. of Texas Health Science Center                                                                                                    | 150                | Aug 96 – Aug 99     |  |  |
|                                                                                                                                                                   | University of Texas at Austin                                                                                                           | 200                | Sep 81 – Dec 84     |  |  |
| Mathematics Pertaining to the Use and                                                                                                                             | Cornell University, NY                                                                                                                  | 150                | Aug 89 – May 91     |  |  |
| Measurement of Radioactivity                                                                                                                                      | Univ. of Texas Health Science Center                                                                                                    | 100                | Aug 96 – Aug 99     |  |  |
|                                                                                                                                                                   | University of Texas at Austin                                                                                                           | 50                 | Sep 81 – Dec 84     |  |  |
| Radiation Biology                                                                                                                                                 | Cornell University, NY                                                                                                                  | 150                | Aug 89 – May 91     |  |  |
| Radiation Biology                                                                                                                                                 | Univ. of Texas Health Science Center                                                                                                    | 150                | Aug 96 – Aug 99     |  |  |
| Chemistry of Byproduct Material for                                                                                                                               | Univ. of Texas Health Science Center                                                                                                    | 100                | Aug 96 – Aug 99     |  |  |
|                                                                                                                                                                   |                                                                                                                                         |                    |                     |  |  |
|                                                                                                                                                                   | Liniversity of Tayas at Austin                                                                                                          | 50                 | Sen 81 - Dec 84     |  |  |
|                                                                                                                                                                   |                                                                                                                                         | 450                |                     |  |  |
| Radiation Dosimetry                                                                                                                                               |                                                                                                                                         | 150                | Aug os – May 91     |  |  |
|                                                                                                                                                                   | Univ. of Texas Health Science Center                                                                                                    | 150                | Aug 96 – Aug 99     |  |  |

NRC FORM 313A (8-1999)

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NRC Form 313A \_ LTC John Mercier, Ph.D., May 2002

| 5. PRACTICAL EXPERIENCE WITH RADITION (Actual use of radionuclides or equivalent experience)                                                                                                                                                                                                                                                                                                                                                                                       |                                      |                                                                                               |                                              |                                           |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-----------------------------------------------------------------------------------------------|----------------------------------------------|-------------------------------------------|--|
| Description of Experience                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Name of<br>Supervising<br>Individual | Location and<br>Corresponding<br>Material<br>License                                          | Dates and<br>Clock Hours<br>of<br>Experience | Related<br>Radiation Safety<br>Exam Score |  |
| Nuclear Medical Science Officer, U.S. Army                                                                                                                                                                                                                                                                                                                                                                                                                                         | LTC Europe Better CHB                | Abordoon Browing                                                                              | 100 95 Dec 95                                | NI/A                                      |  |
| Fuctieral Neuronal Science Onicer, 0.5. Army<br>Environmental Hygiene Agency. Radiation<br>protection, dosimetry and calibration duties for:<br>Any byproduct material with atomic no.'s<br>1 - 84, any form, not to exceed 800 mCi<br>each or 10 Ci total.<br>Any byproduct material with atomic no.'s<br>1 - 100, any form, not to exceed 15 uCi<br>each or 500 uCi total.<br>J.L Shepard Cs-137 sealed 130 mCi<br>calibration source.<br>Various plutonium and uranium sources. | LTC Eugene Foller, CHP               | Aberdeen Proving<br>Ground, MD<br>USNRC Licenses:<br>#19-09880-01,<br>#SMB-707and<br>#SNM-860 | (900 hours)                                  | N/A                                       |  |
| Radiation Safety Officer, Darnall Army<br>Community Hospital. Radiation protection,<br>dosimetry radioactive waste management, health<br>physics program management and calibration                                                                                                                                                                                                                                                                                                | MAJ Jerome Karwacki,M.D.             | Fort Hood, TX<br>USNRC License<br>#42-19113-01                                                | Jan 86 – Dec 88<br>(6000 hours)              | N/A                                       |  |
| duties for:<br>Any byproduct material with atomic no.'s<br>1 – 83 for use as radiopharmaceuticals in<br>diagnosis and therapy.<br>Various calibration sources.                                                                                                                                                                                                                                                                                                                     |                                      |                                                                                               |                                              |                                           |  |
| Graduate Student, Cornell University.<br>Senior reactor operator for TRIGA reactor,<br>with 10 <sup>14</sup> neutron flux in core and 10 <sup>12</sup><br>neutron flux at beam ports.<br>Gamma cell operator with 10 MCi Co-60<br>irradiation source.                                                                                                                                                                                                                              | Dr. K. Bingham Cady, Sc.D.           | Ithaca, NY<br>USNRC License<br>#SOP-10973                                                     | Aug 89 - May 91<br>(1000 hours)              | N/A                                       |  |
| Project Engineer, Defense Nuclear Agency<br>Plutonium Mining Project. Spectroscopy,<br>calibration and respiratory protection duties for a<br>unique environmental restoration project.<br>Various plutonium and americium samples<br>and sources.                                                                                                                                                                                                                                 | Dr. Ed Bramlitt, Ph.D.               | Johnston Island,<br>Pacific Ocean                                                             | Jun 91 – Jun 92<br>(1000 hours)              | N/A                                       |  |
| Radiation Safety Officer (Broad Scope), Tripler<br>Army Medical Center. Radiation protection,<br>dosimetry radioactive waste management, health<br>physics program management and calibration<br>duties for:                                                                                                                                                                                                                                                                       | COL Tom Cashman, M.D.                | Honolulu, HI<br>USNRC License<br>#53-00458-04                                                 | Jun 92 – Jun 96<br>(8000 hours)              | N/A                                       |  |
| Any byproduct material with atomic no.'s<br>1 – 83 for use as radiopharmaceuticals in<br>diagnosis and therapy.<br>J.L Shepard Cs-137 sealed 2200 Ci<br>irradiation source.<br>Various calibration sources.                                                                                                                                                                                                                                                                        |                                      |                                                                                               |                                              |                                           |  |
| Doctoral Candidate, University of Texas Health<br>Science Center.<br>Various research and calibration sources.                                                                                                                                                                                                                                                                                                                                                                     | Dr. Dave Kopp, Ph.D.                 |                                                                                               | Aug 96 – Aug 99<br>(100 hours)               | N/A                                       |  |
| Nuclear Scientist, U.S. Army Nuclear and<br>Chemical Agency.<br>Scientific editor and contributing author to a<br>North Atlantic Treaty Organization allied<br>engineering publication on sampling and<br>identification of radiological agents.                                                                                                                                                                                                                                   | Dr. Chuck Davidson, Ph.D.            |                                                                                               | Aug 99 – May 02<br>(500 hours)               | N/A                                       |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                      |                                                                                               |                                              |                                           |  |

| ••                          | NRC Form 313A r LTC John Mercier, Ph.D., May 200                                     |               |                                                                                                                                                                                |  |  |  |
|-----------------------------|--------------------------------------------------------------------------------------|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|
| 6. FORMAL TRAINING          |                                                                                      |               |                                                                                                                                                                                |  |  |  |
| Degree, Area of Study       | Name of Program and<br>Location with<br>Corresponding<br>Materials License<br>Number | Dates<br>EX-b | Name of Organization that<br>Approved the Program (e.g.,<br>Accreditation Council for<br>Graduate Medical Education)<br>and the Applicable Regulation<br>(e.g., 10 CFR 35.294) |  |  |  |
| B.E.S., Nuclear Engineering | University of Texas at Austin                                                        |               | ABET Accredited                                                                                                                                                                |  |  |  |
| M.Eng., Nuclear Engineering | Cornell University, NY                                                               |               | ABET Accredited                                                                                                                                                                |  |  |  |
| Ph.D., Radiological Physics | Univ. of Texas Health Science<br>Center                                              |               | CAMPEP Accredited                                                                                                                                                              |  |  |  |

LTC John Mercier May 2002

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## LIEUTENANT COLONEL JOHN R. MERCIER, Ph.D., PE, DABR Nuclear Medical Science Officer

U.S. Army Nuclear and Chemical Agency

wk: (703)806-7860 cell: ( mercier@usanca-smtp.army.mil

## FORMAL EDUCATION

Doctor of Philosophy (Radiological Physics), The University of Texas Health Science Center, San Antonio, Texas, 42 6 Master of Engineering (Nuclear). Cornell University, Ithaca, New York,

Bachelor of Engineering (Nuclear), Cornell University, Ithaca, New York, Bachelor of Engineering Science (Nuclear), The University of Texas, Austin, Texas,

#### **PROFESSIONAL CREDENTIALS**

Diplomate, American Board of Radiology, Dual Certified in Diagnostic Radiological Physics and Medical Nuclear Physics, ABR Physicist # P1779, 1995

Licensed Medical Physicist, Texas, # MP0402, 1995

Licensed Professional Nuclear Engineer, Texas PE Registration # 80363, 1995

Licensed Nuclear Plant Senior Reactor Operator, TRIGA Reactor, NRC License #SOP-10973, 1990

Certified Hazard Control Manager, International Board of Hazard Control Management, Master Certification # 2490, 1993

#### **CURRENT AFFILIATIONS AND PROFESSIONAL MEMBERSHIPS**

Sigma Xi – The Scientific Research Society

Tau Beta Pi - The National Engineering Honor Society

American Nuclear Society

Health Physics Society

\* Past-President for Hawaii Chapter

American Association of Physicists in Medicine

\* Member of Task Group 10 on computed radiography digital imaging North Atlantic Treaty Organization (NATO):

U.S. Delegate to NATO Land Group 7 on Joint NBC Defense

U.S. Delegate to NATO Land Group 7 Expert Subgroup on Sampling and

Identification of Biological, Chemical and Radiological Agents

U.S. Delegate to NATO Land Group 7, Expert Working Group on Low-Level Radiation

U.S. Delegate to NATO Standardization Agency's NBC Working Group

U.S. Delegate to NATO Standardization Agency's Medical NBC Working Party

U.S. Delegate to NATO Research and Technology Board's Task Group on Radiation Treatments and Countermeasures

The Technical Cooperation Program (TTCP) of the American, British, Canadian, and Australian (ABCA) Alliance:

Member, Action Group 48 on Radiation Hazards

Department of Defense:

Chair, DoD Weapons of Mass Destruction Human Response Panel

Member, Nuclear Warfare Casualty Panel of Experts, Joint Readiness Clinical Advisory Board

Department of the Army:

Alternate Army Reactor Officer

Member, Nuclear Employment Augmentation Team

#### PUBLICATIONS

Anno, G., R. Bloom, J. R. Mercier, R. W. Young, *Dose Response Functions for Acute Radiation Lethality*, submitted to Health Physics, 2002.

Lankipalli, B. R., W. D. McDavid, S. B. Dove, E. Wieckowska, R. G. Waggener, and J. R. Mercier, Comparison of Five Methods for the Derivation of Spectra for a Constant Potential Dental X-Ray Unit, Dentomaxillofacial Radiology, 30, 2001, p. 264-269.

Mercier, J. R., Commander's Guide on Low-Level Radiation (LLR) Exposure in Military Operations, Edition 2, Draft Standardization Agreement 2473, North Atlantic Treaty Organization, 2002.

Mercier, J. R., Commander's Guide on Nuclear Radiation Exposure of Groups During War, Edition 6, NATO Standardization Agreement 2083, North Atlantic Treaty Organization, 2001.

Mercier, J. R., D. T. Kopp, W. D. McDavid, S. B. Dove, J. L. Lancaster, and D. M. Tucker, Modification and Benchmarking of MCNP for Low-Energy Tungsten Spectra, Medical Physics, 27(12), 2000, p. 2680-2687.

Mercier, J. R., D. T. Kopp, W. D. McDavid, S. B. Dove, J. L. Lancaster, and D. M. Tucker, Measurement and Validation of Benchmark-Quality Thick-Target Tungsten X-Ray Spectra below 150 kVp, Radiation Research, 154, 2000, p. 564-581.

Mercier, J. R., D. T. Kopp, W. D. McDavid, S. B. Dove, J. L. Lancaster, and D. M. Tucker, Using Measured 30-150 kVp Polychromatic Tungsten X-Ray Spectra to Determine Ion Chamber Calibration Factors, Health Physics, 79(4), 2000, p. 402-406.

Mercier, J. R. (Ed.), NATO Handbook for Sampling and Identification of Radiological Agents, Volume 1 (Operational), Allied Engineering Publication 49, North Atlantic Treaty Organization, 2000.

Mercier, J. R., Medical Aspects of Nuclear Weapons and Radiation Effects, Chapter 3 of the FY 01/02 Army Specific Military Requirements for Nuclear and Radiation Effects Information, published by the U.S. Army Deputy Chief of Staff for Operations and Plans (DCSOPS), August 2000.

Mercier, J. R., Measurement and Monte Carlo Prediction of Diagnostic Tungsten X-Ray Spectra, Ph.D. Dissertation, Graduate School of Biomedical Sciences, The University of Texas Health Science Center, San Antonio, TX, 1999. Available from UMI Dissertation Services, Ann Arbor, MI, 1999, UMI No. 9938769.

Seibert, J. A. (Chair), T. Bogucki, T. Ciona, J. Dugan, W. Huda, A. Karellas, J. Mercier, E. Samai, J. Sheppard, B. Stewart, O. Suleiman, D. Tucker, R. Uzenoff, J. Weiser, and C. Willis, Acceptance Testing and Quality Control of Photostimulable Storage Phosphor Imaging Systems, Report of Task Group #10, American Association of Physicists in Medicine, 1998.

Willis, C. E., J. Mercier, M. Patel, *Modification of Conventional Quality Assurance Procedures to Accommodate Computed Radiography*, Proceedings of the 13<sup>th</sup> Conference of Computer Applications in Radiology, Society for Computer Applications in Radiology, Denver, CO, 1996.

Mercier, J. R., and Bramlitt, E. T., A Soil Cleanup on Johnston Atoll, Proceedings of the First Symposium on Soil Cleanup in the Pacific Islands, American Society of Civil Engineers, Honolulu, HI, 1993.

Moroney, J. D., Johnson, N. R., Moroney, K. S., Mercier, J. R., An Improved Method for Removing Transuranics from Coral Soil at Johnston Atoll, Proceedings of the 1992 Federal Environmental Restoration Conference, Hazardous Materials Control Resources Institute, Vienna, VA, 1992.

#### ABSTRACTS AND POSTERS

Liu, H. L., Y. Pu, T. Andrews, J. Mercier, P. T. Fox, and J.-H. Gao, Cerebral Blood Flow Measurement Using Adaptive Threshold for Singular Value Decomposition Technique on Dynamic Contrast Agent MR Perfusion Imaging, 7<sup>th</sup> Meeting of the International Society for Magnetic Resonance in Medicine, Philadelphia, PA, 1999.

Mercier, J. R., D. T. Kopp, D. M. Tucker, C. E. Willis and J. L. Lancaster, X-Ray Spectra Resolution Requirements for Characterization of Image Receptors, 84<sup>th</sup> Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, Il, 1998.

Mercier, J. and D. Kopp, Preliminary Evaluation of the Monte Carlo Code MCNP4b for Diagnostic X-Ray Spectra, 40<sup>th</sup> Annual Meeting of the American Association of Physicists in Medicine, Medical Physics, 1998, 25(7): p.A105.

Willis, C. E., J. R. Mercier, M. G. Patel, Unresolved Issues in Computed Radiography, 38<sup>th</sup> Annual Meeting of the American Association of Physicists in Medicine, Medical Physics, 1996, 23(6): p.1076.

#### **PROFESSIONAL AND LEADERSHIP EXPERIENCE**

#### Nuclear Scientist 8/99 - present

U.S. Army Nuclear and Chemical Agency, Springfield, VA

Primary consulting subject matter expert (SME) to Army Staff and other DoD/NATO/U.S. Government agencies on the medical effects of nuclear weapons and radiation. Sets policy on friendly troop safety risk criteria and enemy personnel casualty criteria for nuclear weapons effects. Develops casualty estimation models for nuclear, biological and chemical (NBC) weapons. Serves on numerous DoD and NATO SME panels for NBC research, operational doctrine and equipment development. Develops Army R&D requirements for radiobiology, biomedical technology and NBC operations. Serves as Alternate Army Reactor Officer for the Army Reactor Office that maintains oversight of WSMR and APG fast burst reactors. Serves on the Nuclear Employment Augmentation Team in support of CINC's.

#### Doctoral Student 8/96 – 8/99

The University of Texas Health Science Center, San Antonio, TX

Research focused on diagnostic imaging, the use of Monte Carlo codes to simulate x-ray beam formation and transport, measurement of x-ray spectra, computed radiography and other digital imaging systems. Teaching duties and course work broadly covered the medical radiological physics profession.

#### **Chief, Health Physics** 6/92 – 6/96 Tripler Army Medical Center, Honolulu, HI 96859-5000

Executive agent and Radiation Safety Officer for a broad-scope USNRC radioactive material license (#53-00458-04). Directed comprehensive health physics services for a major teaching and research hospital. Developed or approved nuclear medicine, diagnostic radiology and radiation therapy QC protocols. Performed gamma camera acceptance testing. Evaluated and approved all Pacific region radiological facility designs. Conducted health and medical physics audits. Routinely provided formal and informal radiation safety training and imaging science lectures to nuclear medicine and radiology technologists. Routinely counseled physicians, patients, and hospital staff on radiation effects. Occasionally lectured radiology residents in imaging physics.

**Project Engineer**, Johnston Atoll Plutonium Mining Project 5/91 - 6/92 Defense Nuclear Agency, Kirtland AFB, NM 87115-5000

Spearheaded the Defense Nuclear Agency's \$15 million Plutonium Mining Project. Led world's first successful remediation of plutonium contaminated soil. Designed several multichannel analyzer radioassay systems using sodium iodide and high-pure germanium spectroscopy detectors. Developed and enforced various radiation safety, bioassay, and respiratory protection programs.

#### **Graduate Student** 8/89 – 5/91 Cornell University, Ithaca, NY

Research focused on characterizing radiation damage to electronic components using the Cornell gamma irradiation facility. Gained experience as a federally licensed nuclear plant senior reactor operator (License # SOP-10973) that required mastery of all research facilities and radiological monitoring equipment within the reactor building. Developed experimental research protocols for the TRIGA reactor and assisted in training a reactor operator. Course work broadly covered the nuclear engineering profession.

#### **Radiation Protection Officer** 12/85 - 12/88 Darnall Army Community Hospital, Ft Hood, TX 76544-5063

Executive agent and Radiation Safety Officer for USNRC limited-scope radioactive material license (#42-19113-01). Hospital consultant for health physics, diagnostic radiology physics, & medical nuclear physics. Developed radiation protection, radiology QA/QC, & nuclear medicine QA/QC programs. Performed health & medical physics audits, calibrations, x-ray system & shielding surveys. Troubleshooted image quality problems. Trained all radiation workers.

#### Nuclear Medical Science Officer 1/85 - 12/85 US Army Environmental Hygiene Agency, APG, MD 21010-5422

Consulted Army and DoD installations for adequate radiation protection, radiology QA/QC, and nuclear medicine QA/QC programs. Wrote safety and QC procedures and evaluated x-ray system performance. Conducted radiological shielding evaluations and health hazard assessments of equipment and facilities.

**Commander, Detachment 1, A Company** 12/82 – 12/84 249<sup>th</sup> Supply and Transport Battalion, 49<sup>th</sup> Armored Division, Texas Army National Guard, Killeen, TX

Exercised command. Led with honor and respect.

**Platoon Leader, HHQ Company** 8/81 – 11/82 249<sup>th</sup> Supply and Transport Battalion, 49<sup>th</sup> Armored Division, Texas Army National Guard, Austin, TX

Developed leadership skills.



#### UNITED STATES NUCLEAR REGULATORY COMMISSIO REGION I 475 ALLENDALE ROAD KING OF PRUSSIA, PENNSYLVANIA 19406-1415

#### August 8, 2002

License Nos.

08-01738-02 08-01738-03

Docket Nos. 03001317 03006895 Control Nos. 131859 131860

William B. Johnson, Ph.D. Radiation Safety Officer Department of the Army Walter Reed Army Medical Center (WRAMC) Washington, DC 20307-5001

## SUBJECT: DEPARTMENT OF THE ARMY, ISSUANCE OF LICENSE AMENDMENT, CONTROL NOS. 131859 AND 131860

Dear Dr. Johnson:

This refers to your request dated July 19, 2002, for amendment to the above listed NRC licenses. Enclosed with this letter are the amended licenses.

Please review the enclosed documents carefully and be sure that you understand and fully implement all the conditions incorporated into the amended licenses. If there are any errors or questions, please notify the U.S. Nuclear Regulatory Commission, Region I Office, Licensing Assistance Team, (610) 337-5239, so that we can provide appropriate corrections and answers.

In accordance with 10 CFR 2.790, a copy of this letter will be placed in the NRC Public Document Room and will be accessible from the NRC Web site at http://www.nrc.gov/reading-rm.html.

Thank you for your cooperation.

Sincerely,

Original signed by Sattar Lodhi, Ph.D.

Sattar Lodhi, Ph.D. Health Physicist Nuclear Materials Safety Branch 2 Division of Nuclear Materials Safety

information in this record was deleted in accordance with the Freedom of Information Act. exemptions FOIA- 200

1210023
W. Johnson Department of the Army

Enclosures:

Amendment No. 74 (License No. 08-01738-02) Amendment No. 28 (License No. 08-01738-03)

CC:

LTC John R. Mercier, Ph.D., Radiation Safety Officer COL Eric Daxon, Director, Proponency Office of Preventive Medicine W. Johnson Department of the Army

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NRC FORM 374

U.S. NUCLEAR REGULATORY COMMISSION PAGE \_\_1\_OF \_\_6\_PAGES Amendment No. 74

| Pursu<br>of Fe<br>hereto<br>sourc<br>delive<br>shall<br>applic<br>below | Duplicate<br>ant to the Atomic Energy Act of 1954, as a<br>deral Regulations, Chapter I, Parts 30, 3<br>ofore made by the licensee, a license is he<br>e, and special nuclear material designate<br>er or transfer such material to persons auth<br>be deemed to contain the conditions spec-<br>cable rules, regulations, and orders of the<br>r. | MATERIALS<br>amended, the Energy R<br>1, 32, 33, 34, 35, 36, 3<br>ereby issued authorizing<br>d below; to use such m<br>orized to receive it in acc<br>cified in Section 183 of<br>Nuclear Regulatory Cor | Leorganization Act of 1<br>39, 40, and 70, and in<br>9 the licensee to receiv<br>aterial for the purpose<br>cordance with the regu<br>the Atomic Energy Ac<br>mmission now or herea | DUDICATE<br>974 (Public Law 93-438), and Title 10, Code<br>reliance on statements and representations<br>e, acquire, possess, and transfer byproduct,<br>(s) and at the place(s) designated below; to<br>lations of the applicable Part(s). This license<br>at of 1954, as amended, and is subject to all<br>after in effect and to any conditions specified |
|-------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                         | Licensee                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                           | In accordance w                                                                                                                                                                     | th the letter dated                                                                                                                                                                                                                                                                                                                                          |
|                                                                         |                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                           | July 19, 2002,                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                              |
| 1. D                                                                    | epartment of the Army                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                           | 3. License number                                                                                                                                                                   | 08-01738-02 is amended in                                                                                                                                                                                                                                                                                                                                    |
| N                                                                       | /alter Reed Army Medical Center (                                                                                                                                                                                                                                                                                                                  | (WRAMC)                                                                                                                                                                                                   | its entirety to rea                                                                                                                                                                 | d as follows:                                                                                                                                                                                                                                                                                                                                                |
| - M                                                                     | lashington D.C. 20207 5001                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                           |                                                                                                                                                                                     | upo 20, 2004                                                                                                                                                                                                                                                                                                                                                 |
| 2. VI                                                                   |                                                                                                                                                                                                                                                                                                                                                    | s                                                                                                                                                                                                         | 5. Docket No. 030                                                                                                                                                                   | 01317                                                                                                                                                                                                                                                                                                                                                        |
|                                                                         |                                                                                                                                                                                                                                                                                                                                                    | · .                                                                                                                                                                                                       | Reference No.                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                              |
|                                                                         |                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                           | 1 1633°                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                              |
| 6.                                                                      | Byproduct, source, and/or special nuclear material                                                                                                                                                                                                                                                                                                 | 7. Chemical and/or p                                                                                                                                                                                      | physical form                                                                                                                                                                       | 8. Maximum amount that licensee may<br>possess at any one time under this<br>license                                                                                                                                                                                                                                                                         |
| Α.                                                                      | Any byproduct material with atomic numbers 1-83                                                                                                                                                                                                                                                                                                    | A Any                                                                                                                                                                                                     |                                                                                                                                                                                     | A. 400 millicuries of each<br>radionuclide with a total<br>possession limit of 26 curies                                                                                                                                                                                                                                                                     |
| В.                                                                      | Iodine 131                                                                                                                                                                                                                                                                                                                                         | B. Any                                                                                                                                                                                                    |                                                                                                                                                                                     | B. 2 curies                                                                                                                                                                                                                                                                                                                                                  |
| C.                                                                      | Xenon 133                                                                                                                                                                                                                                                                                                                                          | C. Any                                                                                                                                                                                                    |                                                                                                                                                                                     | C. 2 curies                                                                                                                                                                                                                                                                                                                                                  |
| , D.                                                                    | Krypton 85                                                                                                                                                                                                                                                                                                                                         | D. Any                                                                                                                                                                                                    |                                                                                                                                                                                     | D. 1 curie                                                                                                                                                                                                                                                                                                                                                   |
| E.                                                                      | Phosphorus 32                                                                                                                                                                                                                                                                                                                                      | E. Any                                                                                                                                                                                                    |                                                                                                                                                                                     | E. 2 curies                                                                                                                                                                                                                                                                                                                                                  |
| F.                                                                      | Carbon 14                                                                                                                                                                                                                                                                                                                                          | F. Any                                                                                                                                                                                                    |                                                                                                                                                                                     | F. 2 curies                                                                                                                                                                                                                                                                                                                                                  |
| G.                                                                      | lodine 125                                                                                                                                                                                                                                                                                                                                         | G. Any                                                                                                                                                                                                    |                                                                                                                                                                                     | G. 1 curie                                                                                                                                                                                                                                                                                                                                                   |
| ·Н.                                                                     | Iridium 192                                                                                                                                                                                                                                                                                                                                        | H. Any                                                                                                                                                                                                    | • • •                                                                                                                                                                               | Н.                                                                                                                                                                                                                                                                                                                                                           |
| - <b>L</b> *                                                            | Chromium 51                                                                                                                                                                                                                                                                                                                                        | I. Any                                                                                                                                                                                                    |                                                                                                                                                                                     | I. 750 millicuries                                                                                                                                                                                                                                                                                                                                           |
| J.                                                                      | Sulfur 35                                                                                                                                                                                                                                                                                                                                          | J. Any                                                                                                                                                                                                    |                                                                                                                                                                                     | J. 1 curie                                                                                                                                                                                                                                                                                                                                                   |
| К.                                                                      | Hydrogen 3                                                                                                                                                                                                                                                                                                                                         | K. Any                                                                                                                                                                                                    | í.                                                                                                                                                                                  | K. 5 curies                                                                                                                                                                                                                                                                                                                                                  |
| L.                                                                      | Molybdenum 99                                                                                                                                                                                                                                                                                                                                      | L. Molybdenum 9                                                                                                                                                                                           | 99/                                                                                                                                                                                 | L. 23 curies                                                                                                                                                                                                                                                                                                                                                 |
| M.                                                                      | Duplicate<br>Technetium 99m                                                                                                                                                                                                                                                                                                                        | Technetium 99<br>DUDI<br>M. Any                                                                                                                                                                           | m Generators<br>IICATE                                                                                                                                                              | M. 23 curies                                                                                                                                                                                                                                                                                                                                                 |

Ex2



| NRC FORM 374A                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | ATORY COMMISSION                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                     | PAGE 3                                                                                                                                                                                                                                              | of 6 PAGES                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
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| Dupli                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Duplica                                                                                                                                                                                                                                                                                                                                                            | License Number<br>08-01738-02<br>Docket or Reference Nu                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                     | cate                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|                                                                                                                                                                                                                                                                                                                                                                      | SUPPLEMENTARY SHEET                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                    | 030-01317                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|                                                                                                                                                                                                                                                                                                                                                                      | · ·                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                    | Amendment No.                                                                                                                                                                                                                                                                                                                       | 74                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | • <u> </u>                                                                                                                                                                                                                                                                                                                                                         | ,                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 9. Authorized use                                                                                                                                                                                                                                                                                                                                                    | <b>e</b> :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | a                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                     | · · · ·                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| A. through DD.                                                                                                                                                                                                                                                                                                                                                       | Medical diagnosis, ther<br>Food and Drug Admini<br>defined in 10 CFR 30.4<br>instruction.                                                                                                                                                                                                                                                                                                                                                                                                                                 | apy and research<br>stration (FDA) req<br>I, including animal                                                                                                                                                                                                                                                                                                      | in humans in acco<br>uirements. Resea<br>studies; instrume                                                                                                                                                                                                                                                                          | ordance with a<br>rch and devel<br>nt calibration;                                                                                                                                                                                                  | ny applicable<br>opment as<br>student                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| EE. Shielding in lin                                                                                                                                                                                                                                                                                                                                                 | ear accelerators.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <u>NR REC</u>                                                                                                                                                                                                                                                                                                                                                      | h. #                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | CONDITIONS                                                                                                                                                                                                                                                                                                                                                         | ×44,                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <ul> <li>10. Licensed mater<br/>Center, Washi<br/>Medical Labor<br/>13 Taft Court,<br/>Rockville, Mar</li> <li>11. A. Licensed<br/>the Radia</li> <li>B. The use of<br/>in 10 CFF</li> <li>C. Physician<br/>training of<br/>licensee's</li> <li>D. Individual<br/>training at<br/>Regulator<br/>as a media<br/>addition, for<br/>recent, de<br/>brachythe</li> </ul> | erial may be used only at the<br>ngton, D. C., WRAMC For<br>atory, WRAMC Department<br>Rockville, Maryland and G<br>yland.<br>material shall be used by,<br>tion Safety Committee, Co<br>of licensed material in or or<br>35.2.<br>s, dentists, or podiatrists d<br>iteria established in 10 CF<br>Radiation Safety Committees<br>and experience criteria esta<br>y Commission or Agreeme<br>cal physicist; and shall be<br>the physicist must meet the<br>evice-specific training and e<br>arapy device used by the lite | ne licensee's facilitiest Glen Section a<br>of of Pathology, Fo<br>sillette Building, 27<br>or under the super<br>lonel Dale K. Bloc<br>n humans shall be<br>esignated to use I<br>R 35, Subpart J a<br>tee.<br>edical physicists for<br>blished in 10 CFR<br>ent State license, of<br>designated, in write<br>recentness of tra-<br>experience for eac<br>censee. | ties located at the<br>and Annex, Silver<br>ort Meade, Marylar<br>0 Research Cente<br>rvision of, individu<br>k, Chairperson.<br>by a physician, de<br>icensed material ir<br>nd shall be design<br>or intravascular bra<br>35.961; or be nan<br>or a permit issued<br>ting, by the Radiat<br>ining requirement<br>th make and mode | Walter Reed A<br>Spring, Maryla<br>nd; Rickman B<br>er, 1413 Resea<br>als designated<br>entist, or podia<br>n or on human<br>ated in writing<br>achytherapy s<br>ned on a curre<br>under a broad<br>ion Safety Con<br>in 10 CFR 35<br>of intravascu | Army Medical<br>and; U.S. Army<br>building,<br>arch Boulevard,<br>d in writing by<br>d in wri |
| E. The Radia                                                                                                                                                                                                                                                                                                                                                         | ation Safety Officer for this                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | license is Lieuten                                                                                                                                                                                                                                                                                                                                                 | ant Colonel John I                                                                                                                                                                                                                                                                                                                  | R. Mercier.                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 12. In addition to t<br>material at a s<br>consideration                                                                                                                                                                                                                                                                                                             | he possession limits in Iter<br>ingle location to quantities<br>of the need for an emerger                                                                                                                                                                                                                                                                                                                                                                                                                                | m 8, the licensee s<br>below the limits s<br>ncy plan for respo                                                                                                                                                                                                                                                                                                    | shall further restric<br>pecified in 10 CFR<br>nding to a release                                                                                                                                                                                                                                                                   | t the possessi<br>30.72 which r<br>of licensed ma                                                                                                                                                                                                   | on of licensed<br>require<br>aterial.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Dupli                                                                                                                                                                                                                                                                                                                                                                | cate                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Duplica                                                                                                                                                                                                                                                                                                                                                            | te 🗖                                                                                                                                                                                                                                                                                                                                | Dupli                                                                                                                                                                                                                                               | cate                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
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| NRC FORM 374A                                                                                | U.S. NI AR REGUL                                                                                                                                 | ATORY COMMISSION                                                                                     |                                                                                                                         | PAGE 4 of 6 PAGES                                                                                                              |
|----------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| Dupli                                                                                        | Cate<br>MATERIALS LICENSE<br>SUPPLEMENTARY SHEET                                                                                                 | Duplica                                                                                              | License Number<br>08=01738-02<br>Docket or Reference Num<br>030-01317                                                   | Duplicate                                                                                                                      |
|                                                                                              |                                                                                                                                                  |                                                                                                      | Amendment No. 74                                                                                                        | 4                                                                                                                              |
| 13. Notwithstandin<br>the licensee m<br>possess and u<br>criteria in the o<br>applicable U.S | ng the requirements of 10<br>hay use for any medical us<br>use byproduct material for<br>other sections of 10 CFR 3<br>5. Food and Drug Administ | CFR 35.49(a) and<br>e any byproduct n<br>medical use in ac<br>5. This does not<br>ration (FDA) and c | (b), 35.100, 35.200<br>naterial or reagent ki<br>cordance with the pr<br>relieve the licensee f<br>other Federal and St | , 35.300, 35.400 and 35.500<br>t. The licensee shall<br>escriptive and performance<br>from complying with<br>ate requirements. |
| 14. A. Detector<br>conjunctio<br>temperati<br>10 CFR 3                                       | cells containing a titanium<br>on with a properly operatin<br>ures from exceeding that s<br>2.210.                                               | tritide foil of a sca<br>g temperature cor<br>pecified in the cer                                    | ndjum tritide foil sha<br>itrol <sup>*</sup> mechanism whit<br>tificate of registration                                 | II only be used in<br>ch prevents the foil<br>n referred to in                                                                 |
| B. When in the outsic                                                                        | use, detector cells containi<br>le.                                                                                                              | ng a titanium tritid                                                                                 | e foil or a scandium                                                                                                    | tritide foil shall be vented to                                                                                                |
| 15. The licensee s<br>devices conta<br>35.500 and ev                                         | shall conduct a physical inv<br>ining licensed material rec<br>very six months for all othe                                                      | ventory every thre<br>eived and possess<br>r sealed sources a                                        | e months to account<br>sed pursuant to 10 ©<br>and devices.                                                             | for all sealed sources and FR 35.59, 35.400 and                                                                                |
| 16. A. Sealed so<br>contamin<br>certificate                                                  | ources and detector cells c<br>ation at intervals not to exc<br>of registration referred to                                                      | ontaining licensec<br>ceed six months o<br>in 10 CFR 32.210                                          | material shall be tes<br>at such other interv<br>, not to exceed three                                                  | sted for leakage and/or<br>als as are specified by the<br>years.                                                               |
| B. Notwithst<br>be tested                                                                    | anding Paragraph A of this for leakage and/or contam                                                                                             | Condition, sealed                                                                                    | l'sources designed t<br>s not to exceed three                                                                           | o emit alpha particles shall<br>e months.                                                                                      |
| C. In the abs<br>months p<br>be put int                                                      | sence of a certificate from<br>rior to the transfer, a seale<br>o use until tested.                                                              | a transferor indica<br>d source or detec                                                             | ting that a leak test h<br>tor cell received from                                                                       | nas been made within six<br>a another person shall not                                                                         |
| D. Each sea<br>leakage,                                                                      | led source fabricated by th<br>and contamination prior to                                                                                        | e licensee shall b<br>any use or transfe                                                             | e inspected and test<br>er as a sealed source                                                                           | ed for construction defects,<br>e.                                                                                             |
| E. Sealed so                                                                                 | ources and detector cells n                                                                                                                      | eed not be leak te                                                                                   | sted if:                                                                                                                |                                                                                                                                |
| (i) they                                                                                     | v contain only hydrogen-3;                                                                                                                       | or                                                                                                   | •                                                                                                                       | · · · · · · ·                                                                                                                  |
| (ii) they                                                                                    | contain only a radioactive                                                                                                                       | gas; or                                                                                              |                                                                                                                         |                                                                                                                                |
| (iii) the                                                                                    | half-life of the isotope is 30                                                                                                                   | ) days or less; or                                                                                   |                                                                                                                         |                                                                                                                                |
| L(N,1) they<br>than                                                                          | Contain not more than 10<br>10 microcuries of alpha e                                                                                            | 0 microcuries of the mitting material; c                                                             | ‡⊖<br>eta-and/or gamma e<br>r                                                                                           | mitting material or not more                                                                                                   |
|                                                                                              |                                                                                                                                                  |                                                                                                      |                                                                                                                         |                                                                                                                                |
|                                                                                              |                                                                                                                                                  | :                                                                                                    | ·<br>• • •                                                                                                              |                                                                                                                                |

| ' NRC      | FORM 374A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | U.S. 1                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                      | ATORY COMMISSIO                                                                                                                                                                                                                                                                           | <b>i</b> <u>1</u> <u>1</u> <u>1</u> <u>1</u>                                                                                                                                                                                                                                                                                          | PAGE 5                                                                                                                                                                                                                                                             | of 6 PAGES                                                                                                                                                                                                               |
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|            | Dup                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | licate<br>MATERIAL                                                                                                                                                                                                                                                              | S LICENSE                                                                                                                                                                                                                                                                                            | Duplica                                                                                                                                                                                                                                                                                   | License Number<br>08=01738-02<br>Docket or Reference<br>020.01217                                                                                                                                                                                                                                                                     | Dupli                                                                                                                                                                                                                                                              | cate                                                                                                                                                                                                                     |
|            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | SUPPLEMEN                                                                                                                                                                                                                                                                       | TARY SHEET                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                           | 030-01317                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                          |
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|            | (v) the<br>wh<br>te:<br>se<br>te:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | ey are not des<br>nen they are re<br>sted within the<br>aled source of<br>sted for leakag                                                                                                                                                                                       | igned to emit a<br>emoved from s<br>required leak<br>r detector cell s<br>ge and/or conta                                                                                                                                                                                                            | alpha particles, a<br>torage for use o<br>test interval, the<br>shall be stored fo<br>amination.                                                                                                                                                                                          | re in storage, and<br>transfer to anoth<br>y shall be tested b<br>or a period of more                                                                                                                                                                                                                                                 | l are not being u<br>er person, and<br>before use or tra<br>e than 10 years                                                                                                                                                                                        | used. However,<br>have not been<br>ansfer. No<br>without being                                                                                                                                                           |
| 17.<br>18. | <ul> <li>F. The test test sam a report shall be accordal leak test Nuclear report s</li> <li>G. The lice for leak Commis</li> <li>Sealed source</li> <li>The licensee Sulfur 35, Coprovided:</li> <li>A. Waste test and the second second</li></ul> | t shall be capa<br>nple. If the tes<br>shall be filed<br>removed imm<br>ance with Com<br>tresult is know<br>Materials Saf<br>hall specify the<br>ensee is author<br>age and/or cor<br>ssion or an Ag<br>ces or detecto<br>holders by the<br>e is authorized<br>obalt 58, Iridiu | able of detectin<br>st reveals the p<br>with the U.S. N<br>nediately from s<br>mission regula<br>wn with the U.S<br>ety Branch, 47<br>e source or def<br>rized to collect<br>ntamination ma<br>reement State<br>r cells containi<br>e licensee.<br>to hold radioa<br>m 192, Scandi<br>of in this man | ing the presence<br>oresence of 0.00<br>Nuclear Regulato<br>service and deco<br>itions. The repo<br>S. Nuclear Regu<br>5 Allendale Roa<br>tector cell involve<br>leak test sample<br>at be performed<br>to perform such<br>ing licensed material<br>ctive material wi<br>um 46, for decay | of 0.005 microcuri<br>5 microcurie or microcurie<br>ry Commission ar<br>ontaminated, repa<br>t shall be filed wit<br>atory Commission<br>d, King of Prussia<br>ed, the test results<br>sfor analysis by<br>by persons special<br>services.<br>Frial shall not be of<br>the physical half-<br>r-in-storage before<br>for decay a minim | e of radioactive<br>ore of removabl<br>nd the source or<br>ired, or dispose<br>thin five days of<br>h, Region I, ATT<br>Pennsylvania<br>s, and corrective<br>the licensee. Al<br>fically licensed to<br>pened or source<br>life of less than<br>e disposal in orce | material on the<br>e contamination,<br>r detector cell<br>d of in<br>the date the<br>N: Chief,<br>19406. The<br>e action taken.<br>Iternatively, tests<br>by the<br>es removed<br>65 days and<br>linary trash,<br>lives. |
|            | B. Before o<br>appropr<br>determi<br>remove                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | disposal as ord<br>riate survey ins<br>ne that its radi<br>d or obliterated                                                                                                                                                                                                     | olnary trash, th<br>strument set or<br>oactivity canno<br>d.                                                                                                                                                                                                                                         | e waste snall be<br>n its most sensiti<br>ot be distinguish                                                                                                                                                                                                                               | surveyed at the c<br>ve scale and with<br>ed from backgrour                                                                                                                                                                                                                                                                           | no interposed s                                                                                                                                                                                                                                                    | e with the<br>hielding to<br>labels shall be                                                                                                                                                                             |
|            | C. A recom<br>years.<br>placed i<br>the dos<br>perform                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | d of each such<br>The record mu<br>in storage, the<br>e rate measur<br>ned the dispose                                                                                                                                                                                          | n disposal perm<br>ust include the<br>radionuclides<br>ed at the surfa<br>al.                                                                                                                                                                                                                        | nitted under this<br>date of disposal<br>disposed, the su<br>ce of each waste                                                                                                                                                                                                             | License Condition<br>the date on whic<br>rvey instrument u<br>container, and th                                                                                                                                                                                                                                                       | shall be retaine<br>h the byproduct<br>sed, the backgr<br>ne name of the i                                                                                                                                                                                         | ed for three<br>material was<br>ound dose rate,<br>ndividual who                                                                                                                                                         |
| 19.        | The-licensee<br>prescriptive<br>35.100, 35.2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | e shall possess<br>and performan<br>200, and 35.30                                                                                                                                                                                                                              | s and use bypr<br>nce critëria in a<br>i0.                                                                                                                                                                                                                                                           | oduct material fo<br>all sections of 40                                                                                                                                                                                                                                                   | r human research<br>CER-Part 35 exce                                                                                                                                                                                                                                                                                                  | n in accordance<br>ept sections/35.4                                                                                                                                                                                                                               | with the<br>49(a) and (b),                                                                                                                                                                                               |
|            | · ·                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                          |

| NRC FORM 374A U.S. NI AR REGULATORY COMMISSION PAGE 6 of 6 PAGES                                                                                                                                                |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Duplicate Duplica                                                                                                                                                                                               |
| MATERIALS LICENSE     Docket or Reference Number       SUPPLEMENTARY SHEET     030-01317                                                                                                                        |
| Amendment No. 74                                                                                                                                                                                                |
|                                                                                                                                                                                                                 |
| 20 Experimental animals, or the products from experimental animals, that have been administered licensed                                                                                                        |
| materials shall not be used for human consumption.                                                                                                                                                              |
| <ol> <li>The licensee is authorized to transport licensed material in accordance with the provisions of<br/>10 CFR Part 71, "Packaging and Transportation of Radioactive Material."</li> </ol>                  |
| 22. The licensee shall not acquire licensed material in a sealed source or device unless the source or device                                                                                                   |
| has been registered with the U.S. Nuclear Regulatory Commission pursuant to 10 CFR 32.210 or equivalent regulations of an Agreement State.                                                                      |
| 23. Radioactive waste generated shall be stored in accordance with the statements, representations, and                                                                                                         |
| September 9, 1993 and October 29, 1993.                                                                                                                                                                         |
| 24. Notwithstanding the requirements of 10 CFR 35.315(a)(7), the licensee may control contamination in rooms used to house radiopharmaceutical therapy patients in accordance with the commitments and          |
| procedures contained in the letters dated April 8, 1992 and November 24, 1992.                                                                                                                                  |
| 25. Except as specifically provided otherwise in this license, the licensee shall conduct its program in accordance with the statements, representations, and procedures contained in the documents, including  |
| any enclosures, listed below, except for minor changes in the medical use radiation safety procedures as provided in 10 CER 35.31. The U.S. Nuclear Regulatory Commission's regulations shall govern unless the |
| statements, representations, and procedures in the licensee's application and correspondence are more restrictive than the regulations                                                                          |
|                                                                                                                                                                                                                 |
| A. Application dated January 21, 1993<br>B. Letter dated September 9, 1993                                                                                                                                      |
| C. Letter dated October 29, 1993                                                                                                                                                                                |
| E. Letter dated February 15, 1994                                                                                                                                                                               |
| F. Letter dated June 2, 1994<br>G. Letter dated December 6, 1996                                                                                                                                                |
| For the U.S. Nuclear Regulatory Commission                                                                                                                                                                      |
|                                                                                                                                                                                                                 |
| Original signed by Sattar Lodhi, Ph.D. Date August 8, 2002 By                                                                                                                                                   |
| Sattar Lodhi, Ph.D.                                                                                                                                                                                             |
| Dunlicato Din Division of Nuclear Materials Safety                                                                                                                                                              |
| King of Prussia, Pennsylvania 19406                                                                                                                                                                             |
|                                                                                                                                                                                                                 |
|                                                                                                                                                                                                                 |



#### UNITED STATES NUCLEAR REGULATORY COMMISSION **REGION I** 475 ALLENDALE ROAD KING OF PRUSSIA, PENNSYLVANIA 19406-1415

January 8, 2003

License Nos.

08-01738-02 08-01738-03

Docket Nos. 03001317 03006895 Control Nos. 132452 132453

Thomas M. Fitzpatrick, M.D., Ph.D. Deputy Commander for Clinical Services and Chair. Radiation Control Committee Department of the Army Walter Reed Army Medical Center (WRAMC) Washington, DC 20307-5001

#### SUBJECT: DEPARTMENT OF THE ARMY, ISSUANCE OF LICENSE AMENDMENT. CONTROL NO. 132452 AND VOIDANCE OF APPLICATION FOR LICENSE AMENDMENT, CONTROL NO. 132453

Dear COL Fitzpatrick:

This refers to your license amendment request naming you as Chair of the Radiation Control Committee. Enclosed with this letter is amended broadscope license (License No. 08-01738-02). Since your irradiator license does not require a Radiation Control Committee, your amendment request is not necessary for License No. 08-01738-03. This matter was discussed with your Radiation Safety Officer on January 7, 2003. We have, therefore, voided your application to amend License No. 08-01738-03 (irradiator license). This action is taken without prejudice to the resubmission of your request.

Please review the enclosed document carefully and be sure that you understand and fully implement all the conditions incorporated into the amended license. Please note the last condition on your license indicates that, "This license condition applies only to those procedures that are required to be submitted in accordance with the regulations." Therefore, any procedures submitted that were not required by regulation to be submitted, e.g., calibration of dose calibrators, will not be considered a part of your license and were not reviewed during the licensing process. These procedures will be reviewed during inspections, as necessary. If there are any errors or questions, please notify the U.S. Nuclear Regulatory Commission, Region I Office, Licensing Assistance Team, (610) 337-5239, so that we can provide appropriate corrections and answers.

In accordance with 10 CFR 2.790, a copy of this letter will be placed in the NRC Public Document Room and will be accessible from the NRC Web site at http://www.nrc.gov/readingrm.html.

Information in this record was deleted in accordance with the Freedom of Information. Act exemptions FOIA- 2006-02-

MM/17 ML030090491

## T. Fitzpatrick

Department of the Army

Thank you for your cooperation.

Sincerely,

## Original signed by Elizabeth Ullrich

Elizabeth Ullrich Senior Health Physicist Nuclear Materials Safety Branch 2 Division of Nuclear Materials Safety

#### Enclosures:

- 1. Amendment No. 75 for License No. 08-01738-02
- 2. NUREG-1556 Volumes 5, 9, and 11
- 3. NRC Forms 3 and 313
- 4. 10 CFR Part 2, 19, 20, 21, 30, 31, and 35

cc w/encl:

John R. Mercier, Radiation Safety Officer

T. Fitzpatrick Department of the Army

DOCUMENT NAME: G:\Docs\Current\Lic Cvr Letter\L08-01738-02.132452.wpd To receive a copy of this document, indicate in the box: "C" = Copy w/o attach/encl "E" = Copy w/ attach/encl "N" = No copy 64116858

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| , IRC FORM 374                                                                                                                                                                                                                                                                                                                                                | U.S. NUCLEAR REGULATOR                                                                                                                                                                                                       | COMMISSION                                                                                                                                                                                | PAGE <u>1</u> OF <u>7</u> PAGES<br>Amendment No. 75                                                                                                                                                                                                                                                              |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Dinlicate                                                                                                                                                                                                                                                                                                                                                     | MATERIALS LIC                                                                                                                                                                                                                |                                                                                                                                                                                           | Dunlicate                                                                                                                                                                                                                                                                                                        |
| Pursuant to the Atômic Energy Act of 1954, a<br>of Federal Regulations, Chapter I, Parts 30,<br>heretofore made by the licensee, a license is<br>source, and special nuclear material designa<br>deliver or transfer such material to persons au<br>shall be deemed to contain the conditions s<br>applicable rules, regulations, and orders of the<br>below. | s amended, the Energy Reor<br>31, 32, 33, 34, 35, 36, 39,<br>hereby issued authorizing the<br>ted below; to use such mate<br>thorized to receive it in accord<br>pecified in Section 183 of the<br>e Nuclear Regulatory Comm | ganization Act of 1974<br>40, and 70, and in relia<br>e licensee to receive, a<br>rial for the purpose(s)<br>dance with the regulation<br>Atomic Energy Act of<br>ission now or hereafter | (Public Law 93-438), and Title 10, Code<br>ince on statements and representations<br>cquire, possess, and transfer byproduct,<br>and at the place(s) designated below; to<br>ons of the applicable Part(s). This license<br>1954, as amended, and is subject to all<br>in effect and to any conditions specified |
| Licensee                                                                                                                                                                                                                                                                                                                                                      | Ir                                                                                                                                                                                                                           | accordance with t                                                                                                                                                                         | he letter dated                                                                                                                                                                                                                                                                                                  |
|                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                              | ovember 22, 2002                                                                                                                                                                          | •                                                                                                                                                                                                                                                                                                                |
| 1. Department of the Army                                                                                                                                                                                                                                                                                                                                     | 3.                                                                                                                                                                                                                           | License number 08-                                                                                                                                                                        | 01738-02 is amended in                                                                                                                                                                                                                                                                                           |
| Walter Reed Army Medical Cente                                                                                                                                                                                                                                                                                                                                | r (WRAMC) Fit                                                                                                                                                                                                                | s entirety to read a                                                                                                                                                                      | s follows:                                                                                                                                                                                                                                                                                                       |
| 2. Washington, D.C. 20307-5001                                                                                                                                                                                                                                                                                                                                | 4                                                                                                                                                                                                                            | Expiration date June                                                                                                                                                                      | 9 30, 2004                                                                                                                                                                                                                                                                                                       |
|                                                                                                                                                                                                                                                                                                                                                               | 5.                                                                                                                                                                                                                           | Docket No. 030-01                                                                                                                                                                         | 317                                                                                                                                                                                                                                                                                                              |
|                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                              | Reference No.                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                  |
| 6. Byproduct, source, and/or special nuclear material                                                                                                                                                                                                                                                                                                         | 7 Chemical and/or phys                                                                                                                                                                                                       | sical form - 8.                                                                                                                                                                           | Maximum amount that licensee may<br>possess at any one time under this<br>license                                                                                                                                                                                                                                |
| A. Any byproduct material with<br>atomic numbers 1-83                                                                                                                                                                                                                                                                                                         | A. Any                                                                                                                                                                                                                       | A.                                                                                                                                                                                        | 400 millicuries of each<br>radionuclide with a total<br>possession limit of 26 curies                                                                                                                                                                                                                            |
| B. lodine 131                                                                                                                                                                                                                                                                                                                                                 | B. Any                                                                                                                                                                                                                       | <u>)</u>                                                                                                                                                                                  | 2 curies                                                                                                                                                                                                                                                                                                         |
| C. Xenon 133                                                                                                                                                                                                                                                                                                                                                  | C. Any                                                                                                                                                                                                                       | ୍ ର୍ବ୍ର୍ୟୁ                                                                                                                                                                                | 2 curies                                                                                                                                                                                                                                                                                                         |
| D. Krypton 85                                                                                                                                                                                                                                                                                                                                                 | D. Any                                                                                                                                                                                                                       | D.                                                                                                                                                                                        | 1 curie                                                                                                                                                                                                                                                                                                          |
| E. Phosphorus 32                                                                                                                                                                                                                                                                                                                                              | E. Any                                                                                                                                                                                                                       | Ε.                                                                                                                                                                                        | 2 curies                                                                                                                                                                                                                                                                                                         |
| F. Carbon 14                                                                                                                                                                                                                                                                                                                                                  | F. Any                                                                                                                                                                                                                       | <b>F.</b>                                                                                                                                                                                 | 2 curies                                                                                                                                                                                                                                                                                                         |
| G. lodine 125                                                                                                                                                                                                                                                                                                                                                 | G. Any                                                                                                                                                                                                                       | G.                                                                                                                                                                                        | 1 curie                                                                                                                                                                                                                                                                                                          |
| H. Iridium 192                                                                                                                                                                                                                                                                                                                                                | H. Any                                                                                                                                                                                                                       | Н.                                                                                                                                                                                        | 5 50                                                                                                                                                                                                                                                                                                             |
| 1. Chromium 51                                                                                                                                                                                                                                                                                                                                                | I. Any                                                                                                                                                                                                                       | <b>.</b>                                                                                                                                                                                  | 750 millicuries                                                                                                                                                                                                                                                                                                  |
| J. Sulfur 35                                                                                                                                                                                                                                                                                                                                                  | J. Any                                                                                                                                                                                                                       | J.                                                                                                                                                                                        | 1 curie                                                                                                                                                                                                                                                                                                          |
| K. Hydrogen 3                                                                                                                                                                                                                                                                                                                                                 | K. Any                                                                                                                                                                                                                       | К.                                                                                                                                                                                        | 5 curies                                                                                                                                                                                                                                                                                                         |
| L. Molybdenum 99                                                                                                                                                                                                                                                                                                                                              | L. Molybdenum 99/<br>Technetium 99m                                                                                                                                                                                          | L.<br>Generators                                                                                                                                                                          | 23 curies                                                                                                                                                                                                                                                                                                        |
| Duplicate                                                                                                                                                                                                                                                                                                                                                     | a Dupli                                                                                                                                                                                                                      | cate •                                                                                                                                                                                    | Duplicate                                                                                                                                                                                                                                                                                                        |

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U.S. N. \_EAR REGULATORY COMMISSION NRC FORM 374A PAGE 2 of PAGES License Number 08-01738-02 Duplicate Duplica Docket or Reference Number **ERIALS LICENSE** 030-01317 SUPPLEMENTARY SHEET Amendment No. 75 Byproduct, source, and/or special 7. Chemical and/or physical form 8. Maximum amount that licensee may 6. nuclear material possess at any one time under this license M. 23 curies M. Technetium 99m M. Any P. Q.S.1 curie N. Strontium 90 N. Sealed sources Sealed sources O. Cesium 137 P. Gadolinium 153 P. Sealed sources Q. Sealed sources Q. lodine 125 (3M Company seeds) R. lodine 125 Sealed sources 4 sources, not to exceed 300 R. (Norland Inst. Co., Model millicuries each 178A591A/or AECL Models C235 or C324, or Amersham Corp. Model IMC!P2) Sealed sources S. Cesium 137 Sealed sources T. Cobalt 60 U. Americium 241 U. Anv 100 microcuries V. Americium 241 Sealed sources W. Sealed sources and foils W. Nickel 63 W. 1 curie X. lodine 129 X. Sealed sources X. 1 curie Y. Thorium Y. Any Y. 5 kilograms 'Z. Uranium Z. Any Z. 50 kilograms AA. Cesium 137 AA, Sealed sources AA BB. Americium 241 **BB. Sealed sources** BB Duplicate Duplicate Duplicate 

| NRC FORM 374A                                                                                                                                                                                                                 | U.S. N LEAR REGUL                                                                                                                                                                                                                                                                        | ATORY COMMISSION                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | PAGE 3                                             | of 7 PAGES                                                                                                          |
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|                                                                                                                                                                                                                               | ATERIALS LICENSE                                                                                                                                                                                                                                                                         | Duplica                                                                                                                                                                                                                         | License Number<br>08:01738-02<br>Docket or Reference<br>030-01317                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Number                                             | cate                                                                                                                |
|                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                 | Amendment N                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | lo. 75                                             |                                                                                                                     |
|                                                                                                                                                                                                                               | ·<br>·                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                    |                                                                                                                     |
| · · · · · · · · · · · · · · · · · · ·                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                          | ·····                                                                                                                                                                                                                           | · · · · · · · · · · · · · · · · · · ·                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <del></del>                                        |                                                                                                                     |
| 6. Byproduct, source, a<br>nuclear material                                                                                                                                                                                   | nd/or special 7. Che                                                                                                                                                                                                                                                                     | emical and/or physical                                                                                                                                                                                                          | form 8.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Maximum amount th<br>possess at any one<br>license | at licensee may<br>time under this                                                                                  |
| CC. Paladium 103                                                                                                                                                                                                              | CC.Se                                                                                                                                                                                                                                                                                    | aled sources                                                                                                                                                                                                                    | CC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | ). 3 curies                                        | <b>~</b>                                                                                                            |
| DD. Iridium 192                                                                                                                                                                                                               | DD. Se                                                                                                                                                                                                                                                                                   | ealed sources                                                                                                                                                                                                                   | D                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | ». J F                                             | XY                                                                                                                  |
| EE. Uranium deplete<br>Uranium 235                                                                                                                                                                                            | d in EE. Pla                                                                                                                                                                                                                                                                             | ated Metal                                                                                                                                                                                                                      | EE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | . 400 Kilograms                                    |                                                                                                                     |
| 9. Authorized use:                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                          | · · · · · · · · · · · · · · · · · · ·                                                                                                                                                                                           | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                    |                                                                                                                     |
| <ul> <li>A. through DD.</li> <li>EE. Shielding in linea</li> <li>10. Licensed materia<br/>Center, Washing<br/>Medical Laborato<br/>13 Taft Court, Ro<br/>Rockville, Maryla</li> <li>11. A. Licensed mathe Radiatio</li> </ul> | Medical diagnosis, then<br>Food and Drug Admini<br>defined in 10 CFR 304<br>instruction.<br>ir accelerators.<br>al may be used only at the<br>ton, D. C.; WRAMC Fol-<br>ory, WRAMC Department<br>ockville, Maryland and C<br>ind.<br>aterial shall be used by,<br>n Safety Committee, Co | rapy and research<br>stration (FDA) req<br>frincluding animal<br>cuture<br>conditions<br>he licensee's facilit<br>rest Glen Section<br>int of Pathology, Fo<br>aillette Building, 27<br>or under the supe<br>blonel Thomas M. I | in humans in a<br>uirements. Re<br>studies; instru<br>ies located at<br>and Annex, Sill<br>of Meade, Mar<br>O Research Ce<br>rvision of, indiv<br>Fitzpatrick, Cha                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | iduals designated<br>airperson.                    | applicable<br>opment as<br>student<br>wrmy Medical<br>nd; U.S. Army<br>uilding,<br>wrch Boulevard,<br>in writing by |
| B. The use of I<br>in 10 CFR 3<br>C. Physicians                                                                                                                                                                               | censed material in or or<br>5.2.<br>dentists, or podiatrists c                                                                                                                                                                                                                           | n humans shall be<br>lesignated to use l                                                                                                                                                                                        | by a physician                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | , dentist, or podiat                               | trist as defined                                                                                                    |
| the training<br>licensee's R                                                                                                                                                                                                  | criteria established in 10<br>adiation Safety Commit                                                                                                                                                                                                                                     | CFR 35, Subpart<br>tee.                                                                                                                                                                                                         | J and shall be                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | designated in wri                                  | ting by the                                                                                                         |
|                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                    |                                                                                                                     |
| Duplic                                                                                                                                                                                                                        | ate =                                                                                                                                                                                                                                                                                    | Duplica                                                                                                                                                                                                                         | te 🖷                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Duplic                                             | cate                                                                                                                |
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| Duplicate Duplicate Duplicate Duplicate Duplicate Duplicate Duplicate Docket or Reference O30-01317                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | er<br>02 <u>a Duplicate</u><br>erence Number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Amendmer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | nt No. 75                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <ul> <li>D. Individuals designated to work as medical physicists for intravasc training and experience criteria established in 10 CFR 35.961; or Nuclear Regulatory Commission or Agreement State license, or a license as a medical physicist, and shall be designated, in writing Committee. In addition, the physicist must the recentness of 35.972 and have recent, device-specific training and experience frintravascular brachytherapy device used by the licensee.</li> <li>E. The Radiation Safety Officer for this license is Lieutenant Colonel</li> <li>12. In addition to the possession limits in Item 8, the licensee shall further material at a single location to quantities below the limits specified in 1 consideration of the need for an emergency plan for responding to a rosisteration of the need for an emergency plan for responding to a rosisteration of the need for an emergency plan for responding to a rosisteration of the need for an emergency plan for responding to a rosisteration of the licensee may use for any medical use any byproduct material possess and use byproduct material for medical use in accordan performance criteria in the other sections of 10°CFR 35. This does no complying with applicable U.S. Food and Drug Administration (FDA)'a requirements.</li> <li>14. A. Detector cells containing a titanum tritide foil or a scandum tritide conjunction with a property operating temperature control mechanistration (FDA)'s a requirements.</li> <li>15. The licensee shall conduct a physical inventory every three months to devices containing licensed material received and possessed pursuan 35.500 and every six months for all other sealed sources and devices.</li> <li>16. A. Sealed sources and detector cells containing licensed material sh containing a intervals not to exceed six months or at such other certificate of registration referred to in 10 CFR 32.210, not to exceed the tested for leakage and/or contamination at intervals not to exceed six months or at such other certificate of registration referred to in 10 CFR 3</li></ul> | <ul> <li>a permit issued under a broad scope by the Radiation Safety. Training requirement in 10 CFR for each make and model of</li> <li>I John R. Mercier.</li> <li>restrict the possession of licensed to CFR 30.72 which require elease of licensed material.</li> <li>35.200, 35.300, 35.400 and rial or reagent kit. The licensee for with the prescriptive and other Federal and State</li> <li>a foll shall only be used in hism which prevents the foil gistration referred to in</li> <li>candium tritide foil shall be vented to</li> <li>account for all sealed sources and it to 10 CFR 35.59, 35.400 and</li> <li>account for all sealed sources and the of the events.</li> <li>esigned to emit alpha particles shall eed three months.</li> </ul> |

| NRC     | FOR       | M 374A                             | U.\$                                             | S. NL .EAR RI                                                                                                   | EGULATO                        |                                                |                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | PAGE                                   | 5 of                                | 7 PAG                          | ES        |
|---------|-----------|------------------------------------|--------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|--------------------------------|------------------------------------------------|------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|-------------------------------------|--------------------------------|-----------|
|         |           | Dupl                               | icate                                            |                                                                                                                 |                                | Duplic                                         | License Nul                                    | mber<br>8-02                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                        | <u>lica</u>                         | te                             |           |
|         |           | <b>3</b>                           | MATERIA<br>SUPPLEME                              | LS LICEN<br>NTARY SHI                                                                                           | SE<br>EET                      | <b>8</b>                                       | 030-013                                        | 17                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | nder s                                 |                                     | -                              |           |
| •       |           |                                    |                                                  |                                                                                                                 |                                | •<br>•                                         | Amendm                                         | nent No.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 75                                     |                                     |                                |           |
|         | · · · · · |                                    |                                                  |                                                                                                                 |                                |                                                | · · ·                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                        | <u>.</u>                            |                                | <u> </u>  |
| · .     | C.        | In the ab<br>months j<br>be put in | sence of a oprior to the to use until            | certificate fr<br>ransfer, a s<br>tested.                                                                       | om a tra<br>ealed so           | ansferor indi<br>ource or det                  | cating that a<br>ector cell re                 | a leak tes<br>ceived fro                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | t has bee<br>m anothe                  | n made w<br>r person                | rithin six<br>shall no         | i.<br>It  |
|         | D.        | Each sea<br>leakage,               | aled source<br>and contan                        | fabricated b<br>nination pric                                                                                   | by the lic<br>or to any        | ensee shall<br>use or tran                     | be inspecte<br>sfer as a se                    | ed and tes<br>aled sour                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | sted for co                            | onstructio                          | n defect                       | ts,       |
|         | E.        | Sealed s                           | ources and                                       | detector ce                                                                                                     | lls need                       | not be leak                                    | tested if:                                     | •<br>•<br>•                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                        |                                     |                                |           |
|         | • .       | (i) the                            | y contain or                                     | nly hydroger                                                                                                    | n-3; or                        |                                                | *4                                             | À                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                        |                                     |                                |           |
|         |           | (ii) the                           | y contain or                                     | nly a radioad                                                                                                   | ctive gas                      | s; or                                          |                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | · ·                                    |                                     |                                | · · · · · |
| ۰.      | • **      | (iii) the                          | half-life of a                                   | he isotope                                                                                                      | is 30 da                       | ys or less; o                                  | r<br>Al-S                                      | c in the second se |                                        |                                     |                                |           |
|         | . *       | (iv) the<br>tha                    | y contain no<br>in 10 microc                     | ot more than<br>uries of alpl                                                                                   | n 100 mi<br>ha emitt           | icrocuries of<br>ing material                  | beta and/o<br>; or                             | r gamma                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | emitting r                             | naterial o                          | r not mo                       | )re       |
|         | · · ·     | (v) the                            | y are not de                                     | signed to e                                                                                                     | mit alph                       | a particles,                                   | are in storag                                  | ge, and a                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | e not beil                             | ng used.                            | Howeve                         | ər,       |
|         |           | tes<br>sea                         | ted within th<br>aled source                     | e required or detector                                                                                          | eak test<br>cell shal          | interval, thi<br>be stored.                    | ey shall be t<br>or a period                   | ested bef<br>of more ti                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | ore use o<br>nan 10 ye                 | r transfer<br>ars witho             | . No<br>ut being               | י<br>ג    |
| · · · · |           | tes                                | ted for leaka                                    | ige and/or o                                                                                                    | contamir                       | nation.                                        |                                                | ese a                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                        |                                     |                                |           |
| •       | F.        | The test test sam                  | shall be cap<br>ple. If the to                   | able of dete<br>est reveals t                                                                                   | ecting th<br>he pres           | ne presence<br>ence of 0.00                    | of 0.005 mi<br>05 microcuri                    | crocurie c<br>e or more                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | of radioac<br>of remov                 | tive mate<br>able                   | rial on th                     | Ъ         |
|         |           | detector                           | cell shall be                                    | ort shall be<br>removed ir                                                                                      | filed wit<br>nmediat           | h the U.S. N<br>ely from ser                   | luclear Reg<br>vice and de                     | ulatory Co<br>contamina                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | ated, repa                             | n and the<br>lired, or c            | source<br>lisposed             | or<br>I   |
|         |           | the leak<br>Nuclear<br>report sh   | test result is<br>Materials Sa<br>nall specify t | known with<br>afety Branch<br>he source o                                                                       | the U.S<br>, 475 A<br>r detect | S. Nuclear F<br>llendale Roa<br>or cell involv | Regulatory C<br>ad, King of F<br>ved. the test | ommissic<br>Prussia, P<br>results, a                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | on, Regior<br>ennsylvar<br>and correct | n I, ATTN<br>nia 1940<br>tive actio | : Chief,<br>5. The<br>n taken. |           |
|         | G.        | The licer                          | nsee is auth                                     | orized to co                                                                                                    | llect leal                     | k test sampl                                   | es for analy                                   | sis by the                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | licensee                               | Alterna                             | ively,                         |           |
| •       |           | Commis                             | sion or an A                                     | greement S                                                                                                      | itate to p                     | perform such                                   | n services.                                    | ersons spe                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | ecilically i                           | censed L                            | y me                           |           |
|         |           |                                    |                                                  |                                                                                                                 |                                | · · ·                                          |                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                        | •                                   |                                |           |
| · .     | ·<br>·    |                                    | t es                                             | •                                                                                                               |                                | ST &                                           |                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                        | Ха                                  |                                |           |
|         |           | Dupl                               | icate                                            |                                                                                                                 | D                              | )uplic                                         | ate                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Dup                                    | licat                               | е                              |           |
|         |           | · · · · · ·                        |                                                  | 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - | •                              |                                                |                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                        |                                     |                                |           |

| NRC FORM 374A                                           | U.S. NL ZAR                                                                                                                 | REGULATORY COMMISSION                                                                                    | PAGE 6 of 7                                                                                                                                                                    | PAGES                                |
|---------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|
| Dup                                                     | licate<br>MATERIALS LICE<br>SUPPLEMENTARY SI                                                                                | NSE<br>HEET                                                                                              | License Number<br>08=01738-02<br>Docket or Reference Number<br>030-01317                                                                                                       | <u> </u>                             |
|                                                         |                                                                                                                             |                                                                                                          | Amendment No. 75                                                                                                                                                               |                                      |
|                                                         |                                                                                                                             | · · · · · · · · · · · · · · · · · · ·                                                                    |                                                                                                                                                                                |                                      |
| 17. Sealed sour<br>from source                          | ces or detector cells co<br>holders by the license                                                                          | ontaining licensed mate<br>e.                                                                            | erial shall not be opened or sources remo                                                                                                                                      | ved                                  |
| 18. The licensee<br>Sulfur 35, C<br>provided:           | e is authorized to hold r<br>obalt 58, Iridium 192, S                                                                       | radioactive material wit<br>Scandium 46, for decay                                                       | h a physical half-life of less than 65 days<br>/-in-storage before disposal in ordinary tr                                                                                     | and<br>ash,                          |
| A. Waste t                                              | o be disposed of in this                                                                                                    | s manner shall be held                                                                                   | for decay a minimum of ten half-lives.                                                                                                                                         | · · · · ·                            |
| B. Before<br>appropr<br>determi<br>remove               | disposal as ordinary tra<br>iate survey instrument<br>ne that its radioactivity<br>d or obliterated.                        | ash, the waste shall be<br>set on its most sensitiv<br>cannot be distinguishe                            | surveyed at the container surface with the scale and with no interposed shielding ed from background. All radiation labels                                                     | าe<br>  to<br>shall be               |
| C. A record<br>years.<br>placed i<br>the dos<br>perform | d of each such disposa<br>The record must includ<br>in storage, the radionuc<br>e rate measured at the<br>led the disposal. | I permitted under this I<br>le the date of disposal;<br>clides disposed, the su<br>surface of each waste | License Condition shall be retained for the<br>the date on which the byproduct materia<br>invey instrument used, the background do<br>container, and the name of the individua | ree<br>Il was<br>ose rate,<br>al who |
| 19. The licensee<br>prescriptive<br>35.100, 35.2        | e shall possess and use<br>and performance criter<br>00, and 35.300.                                                        | e byproduct material fo<br>ia in all sections of 10                                                      | or human research in accordance with the CFR Part 35 except sections 35.49(a) ar                                                                                               | )<br>)d (b),                         |
| 20. Experimenta<br>materials sh                         | all not be used for hum                                                                                                     | an consumption.                                                                                          | animals, that have been administered lic                                                                                                                                       | ensed                                |
| 21. The licensee<br>10 CFR Part                         | e is authorized to transp<br>t 71, "Packaging and T                                                                         | port licensed material in ransportation of Radio                                                         | n accordance with the provisions of active Material."                                                                                                                          |                                      |
| 22. The licensee<br>has been re<br>equivalent re        | e shall not acquire licen<br>gistered with the U.S. N<br>egulations of an Agreen                                            | nsed material in a seale<br>Nuclear Regulatory Con<br>ment State.                                        | ed source or device unless the source or<br>mmission pursuant to 10 CFR 32.210 or                                                                                              | device                               |
| 23. Radioactive<br>procedures<br>September S            | waste generated shall<br>included with the waste<br>9, 1993 and October 29                                                  | be stored in accordance<br>storage plan describe<br>9, 1993.                                             | ce with the statements, representations, and in the licensee's letter/application date                                                                                         | and<br>d                             |
|                                                         |                                                                                                                             |                                                                                                          |                                                                                                                                                                                |                                      |
| Dup                                                     | licate                                                                                                                      | Duplica                                                                                                  | ate Duplicate                                                                                                                                                                  | 2                                    |
|                                                         |                                                                                                                             |                                                                                                          |                                                                                                                                                                                |                                      |

| NRC             | FORM 374A                                                                                     | U.S. N∟                                                                                                      | .cAR REGUL                                                              | ATORY COMMISSION                                                                                     | PAGE 7 of 7 PAGES                                                                                                                                                                                                                            | <br>}    |
|-----------------|-----------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| · . ·           | - Min                                                                                         | linata                                                                                                       |                                                                         | Dunlic                                                                                               | License Number                                                                                                                                                                                                                               | -        |
|                 |                                                                                               | MATERIALS L                                                                                                  |                                                                         | L'UPIIC                                                                                              | Docket or Reference Number<br>030-01317                                                                                                                                                                                                      | <b>-</b> |
|                 |                                                                                               | SUPPLEMENTA                                                                                                  | IT SHEET                                                                | · · · · · · · ·                                                                                      | Amendment No. 75                                                                                                                                                                                                                             | -        |
| . <u> </u>      | ·····                                                                                         |                                                                                                              |                                                                         | <u></u>                                                                                              | 1                                                                                                                                                                                                                                            |          |
|                 | <b>.</b>                                                                                      | 1                                                                                                            |                                                                         |                                                                                                      |                                                                                                                                                                                                                                              |          |
| 24.             | rooms used                                                                                    | to house radiopha<br>contained in the le                                                                     | armaceutica<br>tters dated                                              | al therapy patien<br>April 8, 1992 an                                                                | ), the licensee may control contamination in ts in accordance with the commitments and nd November 24, 1992.                                                                                                                                 | ·        |
| 25.             | Except as sp<br>accordance<br>any enclosu<br>provided in<br>the stateme                       | pecifically provided<br>with the statemen<br>res, listed below, e<br>10 CFR 35.31. Th<br>nts, representation | d otherwise<br>ts, represe<br>except for r<br>le U.S. Nuc<br>os and pro | in this license, t<br>ntations, and pro<br>ninor changes in<br>lear Regulatory<br>cedures in the lic | the licensee shall conduct its program in<br>ocedures contained in the documents, including<br>the medical use radiation safety procedures as<br>Commission's regulations shall govern unless<br>censee's application and correspondence are |          |
|                 | more restric                                                                                  | tive than the regul                                                                                          | ations.                                                                 |                                                                                                      |                                                                                                                                                                                                                                              |          |
|                 | A. Applica<br>B. Letter c<br>C. Letter c                                                      | tion dated January<br>lated September 9<br>lated October 29,                                                 | / 21, 1993<br>, 1993<br>1993                                            |                                                                                                      |                                                                                                                                                                                                                                              |          |
| ·<br>·          | <ul><li>D. Letter of</li><li>E. Letter of</li><li>F. Letter of</li><li>G. Letter of</li></ul> | ated December 9<br>lated February 15,<br>lated June 2, 1994<br>lated December 6,                             | 1993<br>1994<br>1996                                                    | Anna                                                                                                 |                                                                                                                                                                                                                                              |          |
|                 |                                                                                               |                                                                                                              | 認ら                                                                      |                                                                                                      |                                                                                                                                                                                                                                              |          |
|                 |                                                                                               |                                                                                                              |                                                                         | ***                                                                                                  |                                                                                                                                                                                                                                              |          |
|                 |                                                                                               |                                                                                                              |                                                                         |                                                                                                      |                                                                                                                                                                                                                                              |          |
| · · · · · · · · |                                                                                               |                                                                                                              |                                                                         |                                                                                                      |                                                                                                                                                                                                                                              |          |
| · ·             |                                                                                               |                                                                                                              |                                                                         | For the U.                                                                                           | S. Nuclear Regulatory Commission                                                                                                                                                                                                             |          |
|                 |                                                                                               |                                                                                                              |                                                                         |                                                                                                      |                                                                                                                                                                                                                                              |          |
| Dat             | e <u>Januan</u>                                                                               | / 8. 2003                                                                                                    | . · · ·                                                                 | Or<br>By                                                                                             | iginal signed by Elizabeth Ullrich                                                                                                                                                                                                           | •        |
| · · · ·         |                                                                                               |                                                                                                              |                                                                         | Eliz<br>Nu                                                                                           | zabeth Ullrich<br>Iclear Materials Safety Branch 2                                                                                                                                                                                           | -        |
|                 | Dup                                                                                           | licate                                                                                                       |                                                                         | Dupli                                                                                                | nsion of Nuclear Materials Safety<br>gippi<br>gof-Prussia, Pennsylvania 19406-ate                                                                                                                                                            |          |
|                 |                                                                                               |                                                                                                              |                                                                         |                                                                                                      |                                                                                                                                                                                                                                              |          |



#### UNITED STATES NUCLEAR REGULATORY COMMISSION REGION I 475 ALLENDALE ROAD KING OF PRUSSIA, PENNSYLVANIA 19406-1415

May 26, 2004

Docket No. 03001317 Control No. 133540 License No.

08-01738-02

LTC John R. Mercier, Ph.D. Medical Service Chief, Health Physics Department of the Army Walter Reed Army Medical Center MCHL-HP/Health Physics Office Building 41, Room 38 Washington, DC 203075001

# SUBJECT: DEPARTMENT OF THE ARMY, APPLICATION FOR LICENSING ACTION, CONTROL NO. 133540

Dear LTC Mercier:

This refers to your license amendment request. Enclosed with this letter is the amended license. Building 40 may be released for unrestricted use.

Please review the enclosed document carefully and be sure that you understand and fully implement all the conditions incorporated into the amended license. If there are any errors or questions, please notify the U.S. Nuclear Regulatory Commission, Region I Office, Licensing Assistance Team, (610) 337-5239, so that we can provide appropriate corrections and answers.

In accordance with 10 CFR 2.790, a copy of this letter will be placed in the NRC Public Document Room and will be accessible from the NRC Web site at <u>http://www.nrc.gov/reading-rm.html.</u>

Thank you for your cooperation.

Sincerely,

Original signed by James P. Dwyer

James P. Dwyer Senior Health Physicist Nuclear Materials Safety Branch 1 Division of Nuclear Materials Safety

NMSS/RGNI MATERIALS

ML041490403

Enclosure: Amendment No. 76

> Information in this record was deleted in accordance with the Freedom of Information

Act, exemptions. FOLA 2006-

J. Mercier Department of the Army

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| DATE   | 5/26/4  |       |         |         |        |       |  |

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**U.S. NUCLEAR REGULATORY COMMISSION** 

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MATERIALS LICENSE

Amendment No. 76 *Nuplicate* Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974 (Public Law 93-438), and Title 10, Code of Federal Regulations, Chapter I, Parts 30, 31, 32, 33, 34, 35, 36, 39, 40, and 70, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess, and transfer byproduct, source, and special nuclear material designated below; to use such material for the purpose(s) and at the place(s) designated below; to deliver or transfer such material to persons authorized to receive it in accordance with the regulations of the applicable Part(s). This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, as amended, and is subject to all applicable rules, regulations, and orders of the Nuclear Regulatory Commission now or hereafter in effect and to any conditions specified below.

| Licensee                                                          | In accordance with the letter dated                                                      |
|-------------------------------------------------------------------|------------------------------------------------------------------------------------------|
|                                                                   | August 13, 2003                                                                          |
| 1. Department of the Army                                         | 3. License number 08-01738-02 is amended in                                              |
| Walter Reed Army Medical Center (WRAMC)                           | its entirety to read as follows:                                                         |
| 2. Washington, D.C. 20307-5001 🚬 💭                                | 4. Expiration date June 30, 2004                                                         |
|                                                                   | 5. Docket No. 030-01317                                                                  |
|                                                                   | Reference No.                                                                            |
|                                                                   |                                                                                          |
| 6. Byproduct, source, and/or special 7. Chemical nuclear material | and/or physical form<br>possess at any one time under this<br>license                    |
| A. Any byproduct material with A. Any atomic numbers 1-83         | A. 400 millicuries of each<br>radionuclide with a total<br>possession limit of 26 curies |
| B. Iodine 131 B. Any                                              | B. 2 curies                                                                              |
| C. Xenon 133 C. Any                                               | C: 2 curies                                                                              |
| D. Krypton 85                                                     | D. 1 curie                                                                               |
| E. Phosphorus 32 E. Any                                           | E. 2 curies                                                                              |
| F. Carbon 14 F. Any                                               | F. 2 curies                                                                              |
| G. lodine 125 G. Any                                              | G. 1 curie FX2                                                                           |
| H. Iridium 192 H. Any                                             | Η.                                                                                       |
| I. Chromium 51 I. Any                                             | I. 750 millicuries                                                                       |
| J. Sulfur 35 J. Any                                               | J. 1 curie                                                                               |
| K. Hydrogen 3 K. Any                                              | K. 5 curies                                                                              |
| L. Molybdenum 99 L. Molybd<br>Techne                              | enum 99/ L. 23 curies<br>tium 99m Generators                                             |
| Duplicate D                                                       | uplicate Duplicate                                                                       |

NRC FORM 374A U.S. NULLEAR REGULATORY COMMISSION PAGE PAGES of 7 License Number 08-01738-02 Dup ICATE Docket or Reference Number MATERIALS LICENSE 030-01317 SUPPLEMENTARY SHEET Amendment No. 76 Byproduct, source, and/or special 6. 7. Chemical and/or physical form 8. Maximum amount that licensee may nuclear material possess at any one time under this license M. Technetium 99m M. Any M. 23 curies N. Strontium 90 N. <sup>1</sup> N. Sealed sources e. O. Cesium 137 Sealed source P. Gadolinium 153 P. Sealed sources Q\_1 curie Q. lodine 125 Q. Sealed sources (3M Company seeds) Sealed sources R. lodine 125  $\mathbf{R}$ R. 4 sources, not to exceed 300 (Norland Inst. Co., Model millicuries each 178A591A or AECL Models . decent C235 or C324, or Amersham 1 T Corp. Model IMC.P2) S. Cesium 137 Sealed sources S. Sealed sources T. Cobalt 60 100 microcuries U. Americium 241 An V. Americium 241 V. Sealed sources W. Nickel 63 W. Sealed sources and foils W. 1 curie X. Iodine 129 X. Sealed sources X. 1 curie Y. Thorium Y. Any Y. 5 kilograms Z. Uranium Z. Any Z. 50 kilograms AA. Cesium 137 AA. Sealed sources AA **BB.** Americium 241 **BB.** Sealed sources BB Duplicate Duplicate Duplicate 

| Dublicate       F         MATERIALS LICENSE<br>SUPPLEMENTARY SHEET       Dublicate       Georges-203       Dublicate         Georges-203       Dublicate       Georges-203       Dublicate         Georges-204       Georges-203       Dublicate       Georges-203       Georges-203         Georges-204       Georges-204       Georges-204       Georges-204       Georges-204         CC Paladium 103       CC Sealed sources       DD       Georges-204       EE       Georges-204       Georges-204       Georges-204         CC Paladium 103       CC Sealed sources       DD       EE       400 Kilograms       DD       EE       400 Kilograms       Georges-204       Georges-204 <th>NRC FORM 374A</th> <th>U.S. NUULEAR F</th> <th>REGULATORY COMMISSION</th> <th>PAGE 3 of 7 PAGES</th>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | NRC FORM 374A                                                                                                                                  | U.S. NUULEAR F                                                                                                  | REGULATORY COMMISSION                                                                                                                                   | PAGE 3 of 7 PAGES                                                                                                                                                                       |
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| Amendment No. 76         6. Byproduct, source, and/or special nuclear material       7. Chemical and/or physical form nuclear material income and the under this license         6. C. Paladium 103       CC. Sealed sources       CC. 3 curies         D. Iridium 192       DD. Sealed sources       DD.         EE. Uranium depleted in UEE. Plated Mistal       EE. 400 Kilograms       E. 400 Kilograms         9. Authorized use:       A. through DD.       Medical diagnosis, therapy and research in humans in accordance with any applicable Food and Drug Administration (FDA) requirements. Research and development as definite in 10 CFR 30 - Uncluding animal studies; instrument calibration; student instruction.         EE. Shielding in linear accelerators.       Selectrones         10. Licensed material may be used only at the incenses statistical development, student instruction.       Selectrones         10. Licensed material may be used only at the incenses statistical development, student instruction.       Selectrones         11. A. Licensed material may be used only at the incenses statistical development, fickman Bullering, 13 Taft Court, Rockville, Maryland, and Gillette Building, 270 Research Center, 1413 Research Boulevard, Rockville, Maryland.         11. A. Licensed material shall be used by, or under the supervision of, individuals designated in writing by the Radiation Safety Committee, Colonel Thomas M. Fitzpatrick, Chairperson.         B. The use of licensed material in or on humans shall be used in no CFR 35.2.       Physician, dentists, or podiatrist designated to use licensed mater                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                | ATERIALS LICE                                                                                                   | Duplica                                                                                                                                                 | License Number<br><b>08-01738-02</b><br>Docket or Reference Number<br>030-01317                                                                                                         |
| <ol> <li>Bypnduct, source, and/or special nuclear material nuclear material nuclear material nuclear material nuclear material nuclear material no.</li> <li>C. Paladium 103 CC. Sealed sources CC. 3 curies DD. Iridium 192 DD. Sealed sources DD.</li> <li>E. Uranium depleted in EF. Plated Metal E. 400 Kilograms</li> <li>Authorized use:</li> <li>A through DD. Medical diagnosis, therapy and research in humans in accordance with any applicable Food and Drug Administration (FDA) requirements. Research and development as defined in 10 CFR 30.4. including animal studies, instrument calibration, student instruction.</li> <li>EE. Shielding in linear accelerators.</li> <li>Licensed material may be used only at the licenses tacilities boated at the Walter Reed Army Medical Conter, Washington, D. C. WRAMC Porest Offen Section and Annox, Silver Spring, Maryland; U.S. Army Medical Laboratory, WRAMC Department of Periodgy, Fort Meade, Maryland; Rickman Building, 13 Tat Court, Rockville, Maryland and Cillette Building. 270 Research Center, 1413 Research Boulevard, Rockville, Maryland.</li> <li>A. Licensed material shall be used by, or under the supervision of, individuals designated in writing by the Radiation Safety Committee, Colonel Thomas M. Fitzpatrick, Chairperson.</li> <li>The use of licensed material in or on humans shall be by a physician, dentist, or podiatrist as defined in 10 CFR 35.</li> <li>C. Physicians, dentists, or podiatrists designated to use licensed material in or on humans shall meet the training criteria established in 10 CFR 35, Subpart J and shall be designated in writing by the license's Radiation Safety Committee.</li> <li>Duplicate P. Duplicate P. Duplicate</li> </ol>                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                |                                                                                                                 | :                                                                                                                                                       | Amendment No. 76                                                                                                                                                                        |
| <ul> <li>Byproduct, source, and/or special 7. Chemical and/or physical form and the special theorem and the special theorem and the special theorem and the special theorem and the special an</li></ul> |                                                                                                                                                | · · ·                                                                                                           | · · · ·                                                                                                                                                 | L                                                                                                                                                                                       |
| CC. Paladium 103       CC. Sealed sources       CC. 3 curies         DD. Iridium 192       DD. Sealed sources       DD_         EE. Uranium depleted in<br>Uranium 235       EF. Placed Metal       D_         9. Authorized use:       A. through DD.       Medical filagnosis, therapy and research in humans in accordance with any applicable<br>Food and Drug Administration (FDA) requirements. Research and development as<br>defined in 10 CFR 30.4 including animal studies; instrument calibration; student<br>instruction.         EE. Shielding in linear accelerators.       Image: Condention of Plance and Plance a                                                                                                                                                                                                                       | 6. Byproduct, source, a<br>nuclear material                                                                                                    | nd/or special 7.                                                                                                | Chemical and/or physical                                                                                                                                | form 8. Maximum amount that licensee may possess at any one time under this license                                                                                                     |
| DD. Iridium 192       DD. Sealed sources       DD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | CC. Paladium 103                                                                                                                               | C                                                                                                               | C.Sealed sources                                                                                                                                        | CC. 3 curies                                                                                                                                                                            |
| EE. Uranium depleted in<br>Uranium 235       EE. Plated Metal       EE. 400 Kilograms         9. Authorized use:       A. through DD.       Medical diagnosis, therapy and research in humans in accordance with any applicable<br>Food and Drug Administration (FDA) requirements. Research and development as<br>defined in 10 CFP 30.4 including animal studies; instrument calibration; student<br>instruction.         EE. Shielding in linear accelerators.       CONDITIONS         10. Licensed material may be used only at the licenses's tacilities of and Annex. Silver Spring, Maryland; U.S. Army<br>Medical Laboratory, WRAMC Department of Pathology, Fort Meade, Maryland, Rickman Building,<br>13 Taft Court, Rockville, Maryland and Gillette Building, 270 Research Center, 1413 Research Boulevard,<br>Rockville, Maryland.         11. A. Licensed material shall be used by, or undef the supervision of, individuals designated in writing by<br>the Radiation Safety Committee, Colonel Thomas M. Fitzpatrick, Chairperson.         B. The use of licensed material in or on humans shall be by a physician, dentist, or podiatrist as defined<br>in 10 CFR 35.2.         C. Physicians, dentists, or podiatrists designated to use licensed material in or on humans shall be designated in writing by the<br>licensee's Radiation Safety Committee.         Duplicate       m Duplicate       Duplicate                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | DD. Iridium 192                                                                                                                                | D                                                                                                               | D. Sealed sources                                                                                                                                       | DD! LY2                                                                                                                                                                                 |
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| <ul> <li>10. Licensed material may be used only at the licensee's facilities located at the Walter Reed Army Medical Center, Washington, D. C. WPAMC Forest Glen Section and Annex, Silver Spring, Maryland; U.S. Army Medical Laboratory, WRAMC Department of Pathology, Fort Meade, Maryland; Rickman Building, 13 Taft Court, Rockville, Maryland and Gillette Building, 270 Research Center, 1413 Research Boulevard, Rockville, Maryland.</li> <li>11. A. Licensed material shall be used by, or under the supervision of, individuals designated in writing by the Radiation Safety Committee, Colonel Thomas M. Fitzpatrick, Chairperson.</li> <li>B. The use of licensed material in or on humans shall be by a physician, dentist, or podiatrist as defined in 10 CFR 35.2.</li> <li>C. Physicians, dentists, or podiatrists designated to use licensed material in or on humans shall meet the training criteria established in 10 CFR 35, Subpart J and shall be designated in writing by the licensee's Radiation Safety Committee.</li> <li>Duplicate Duplicate Duplicate Duplicate</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | A. through DD.<br>EE. Shielding in lines                                                                                                       | Medical diagnosis<br>Food and Drug A<br>defined in 10 CFF<br>instruction.<br>ar accelerators.                   | s, therapy and research<br>dministration (FDA) req<br>3 30.4, including anima                                                                           | in humans in accordance with any applicable<br>juirements. Research and development as<br>I studies; instrument calibration; student                                                    |
| <ul> <li>the Radiation Safety Committee, Colonel Thomas M. Fitzpatrick, Chairperson.</li> <li>B. The use of licensed material in or on humans shall be by a physician, dentist, or podiatrist as defined in 10 CFR 35.2.</li> <li>C. Physicians, dentists, or podiatrists designated to use licensed material in or on humans shall meet the training criteria established in 10 CFR 35, Subpart J and shall be designated in writing by the licensee's Radiation Safety Committee.</li> <li>Duplicate Duplicate Duplicate Duplicate</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <ol> <li>Licensed materia<br/>Center, Washing<br/>Medical Laborat<br/>13 Taft Court, R<br/>Rockville, Maryla</li> <li>A. Licensed m</li> </ol> | al may be used on<br>gton, D. C.: WRAM<br>ory, WRAMC Depa<br>ockville, Maryland<br>and.<br>aterial shall be use | CONDITIONS<br>y at the licensee's facili<br>of Forest Glen Section<br>artment of Pathology, Fr<br>and Gillette Building, 27<br>ed by, or under the supe | ties located at the Walter Reed Army Medical<br>and Annex, Silver Spring, Maryland; U.S. Army<br>ort Meade, Maryland; Rickman Building,<br>70 Research Center, 1413 Research Boulevard, |
| C. Physicians, dentists, or podiatrists designated to use licensed material in or on humans shall meet the training criteria established in 10 CFR 35, Subpart J and shall be designated in writing by the licensee's Radiation Safety Committee.  Duplicate Duplicate Duplicate Duplicate                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | the Radiation<br>B. The use of<br>in 10 CFR 3                                                                                                  | on Safety Committe<br>licensed material ir<br>35.2.                                                             | ee, Colonel Thomas M.<br>n or on humans shall be                                                                                                        | Hitzpatrick, Chairperson.<br>by a physician, dentist, or podiatrist as defined                                                                                                          |
| Duplicate - Duplicate - Duplicate                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | C. Physicians,<br>the training<br>licensee's F                                                                                                 | dentists, or podiat<br>criteria established<br>Radiation Safety Co                                              | rists designated to use<br>1 in 10 CFR 35, Subpar<br>ommittee.                                                                                          | licensed material in or on humans shall meet<br>t J and shall be designated in writing by the                                                                                           |
| Duplicate Duplicate Duplicate                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                |                                                                                                                 |                                                                                                                                                         |                                                                                                                                                                                         |
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| NRC FORM 374A                                                                                                                                                                                                                                                                                                                                                          | U.S. NULLEAR REGUL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | ATORY COMMISSION                                                                                                                                                                                                                                                                                                                                                                                                                 | · · ·                                                                                                                                                                                                                                                                                                                                                                                                                | PAGE 4                                                                                                                                                                                                                                                                                   | 4 of 7                                                                                                                                                                                                                             | PAG                             |
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| Duplic                                                                                                                                                                                                                                                                                                                                                                 | ato 🔳                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Duplica                                                                                                                                                                                                                                                                                                                                                                                                                          | License Number                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                          | licate                                                                                                                                                                                                                             |                                 |
| ° M<br>SL                                                                                                                                                                                                                                                                                                                                                              | ATERIALS LICENSE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <b>译</b>                                                                                                                                                                                                                                                                                                                                                                                                                         | 030-01317                                                                                                                                                                                                                                                                                                                                                                                                            | umber s                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                    |                                 |
| •                                                                                                                                                                                                                                                                                                                                                                      | · .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | •                                                                                                                                                                                                                                                                                                                                                                                                                                | Amendment No.                                                                                                                                                                                                                                                                                                                                                                                                        | 76                                                                                                                                                                                                                                                                                       | - <u></u> .                                                                                                                                                                                                                        | ·                               |
|                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                  | l                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                    |                                 |
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| <ul> <li>D. Individuals training and Nuclear Relicense as a Committee. 35.972 and intravascula</li> <li>E. The Radiati</li> <li>12. In addition to the material at a sin consideration of</li> <li>13. Notwithstanding 35.500 the licen shall possess ar performance cri complying with a requirements.</li> <li>14. A. Detector ce conjunction temperature</li> </ul> | designated to work as m<br>designated to work as m<br>desperience criteria esta<br>gulatory Commission or<br>a medical physicist; and s<br>in addition, the physicis<br>have recent, device-spe-<br>ar brachytherapy device<br>for Safety Officer for this<br>e possession limits in Iter<br>gle location to quantities<br>the need for an emerge<br>the requirements of 10<br>see may use for any me-<br>nd use byproduct materia<br>teria in the other sections<br>applicable U.S. Food and<br>with a properly operatin<br>es from exceeding that s | edical physicists f<br>blished in 10 CFF<br>Agreement State<br>shall be designate<br>st must meet the r<br>cific training and o<br>used by the licens<br>a license is Lieuter<br>m 8, the licensee<br>below the limits s<br>ncy plan for respond<br>CFR 35.49(a) and<br>dical use any bypin<br>a for medical use<br>s of 10 CFR 35.71<br>J Drug Administrat<br>tritide foil or a sca<br>g temperature cor<br>pecified in the cer | or intravascular b<br>35.961; or be na<br>license, or a perm<br>d, in writing, by th<br>ecentness of train<br>experience for each<br>ee.<br>hant Colonel John<br>shall further restric<br>pecified in 10 CFI<br>ording to a release<br>(b), 35.100, 35.2<br>roduct material or<br>in accordance wit<br>his does not relie<br>tion (FDA) and oth<br>ndium tritide foil s<br>trol mechanism w<br>tificate of registrat | rachytherapy<br>med on a cu<br>it issued und<br>e Radiation<br>ing requiren<br>ch make and<br>R. Mercier.<br>Ct the posses<br>30.72 which<br>of licensed<br>00, 35.300, 3<br>reagent kit.<br>In the prescri<br>ve the licens<br>er Federal a<br>hall only be<br>hich prevention referred | y shall mee<br>irrent U.S.<br>der a broad<br>Safety<br>nent in 10 (<br>I model of<br>ssion of lice<br>th require<br>material.<br>35.400 and<br>The licens<br>ptive and<br>see from<br>and State<br>used in<br>ts the foil<br>to in | t the<br>I scor<br>CFR<br>ensec |
| 10 CFR 32<br>B. When in us<br>the outside                                                                                                                                                                                                                                                                                                                              | 210.<br>e, detector cells containi                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | ng a titanium tritic                                                                                                                                                                                                                                                                                                                                                                                                             | le foil or a scandiu                                                                                                                                                                                                                                                                                                                                                                                                 | ım tritide foil                                                                                                                                                                                                                                                                          | shall be ve                                                                                                                                                                                                                        | nted                            |
| 15. The licensee sh<br>devices contain<br>35.500 and eve                                                                                                                                                                                                                                                                                                               | all conduct a physical inv<br>ing licensed material rec<br>ry six months for all othe                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | ventory every thre<br>eived and possess<br>r sealed sources a                                                                                                                                                                                                                                                                                                                                                                    | e months to accou<br>sed pursuant to 10<br>and devices.                                                                                                                                                                                                                                                                                                                                                              | int for all sea<br>) CFR 35.59                                                                                                                                                                                                                                                           | aled source<br>, 35.400 an                                                                                                                                                                                                         | s and<br>Id                     |
| 16. A. Sealed sou<br>contaminat<br>certificate c                                                                                                                                                                                                                                                                                                                       | rces and detector cells c<br>ion at intervals not to exc<br>of registration referred to                                                                                                                                                                                                                                                                                                                                                                                                                                                               | ontaining licensec<br>ceed six months o<br>in 10 CFR 32.210                                                                                                                                                                                                                                                                                                                                                                      | I material shall be<br>r at such other inte<br>, not to exceed th                                                                                                                                                                                                                                                                                                                                                    | tested for le<br>ervals as are<br>ree years.                                                                                                                                                                                                                                             | akage and<br>specified l                                                                                                                                                                                                           | /or<br>by the                   |
| B. Notwithstar<br>be tested fo                                                                                                                                                                                                                                                                                                                                         | nding Paragraph A of this<br>or leakage and/or contan                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | s Condition, sealed<br>nination at interval                                                                                                                                                                                                                                                                                                                                                                                      | d sources designe<br>s not to exceed th                                                                                                                                                                                                                                                                                                                                                                              | d to emit alp<br>ree months.                                                                                                                                                                                                                                                             | ha particle                                                                                                                                                                                                                        | s sha                           |
| Duplic                                                                                                                                                                                                                                                                                                                                                                 | cate 🗖                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Duplica                                                                                                                                                                                                                                                                                                                                                                                                                          | ite 🗖                                                                                                                                                                                                                                                                                                                                                                                                                | Dup                                                                                                                                                                                                                                                                                      | icate                                                                                                                                                                                                                              |                                 |
|                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | · .                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                    | •                               |
| · · ·                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                      | · .                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                    |                                 |

|    | M 374A                                                                                                    | U.S. NUCLEAR REGU                                                                                                                                                                                                                              | LATORY COMMISSION                                                                                                                                                                  |                                                                                                                                                                             | PAGE 5                                                                                                                                                  | of 7 PAGES                                                                                                      |
|----|-----------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|
|    |                                                                                                           | Cate<br>MATERIALS LICENSE<br>SUPPLEMENTARY SHEET                                                                                                                                                                                               | Duplica                                                                                                                                                                            | License Number<br>08-01738-02<br>Docket or Reference Nu<br>030-01317                                                                                                        | umber                                                                                                                                                   |                                                                                                                 |
|    |                                                                                                           |                                                                                                                                                                                                                                                |                                                                                                                                                                                    | Amendment No.                                                                                                                                                               | 76                                                                                                                                                      |                                                                                                                 |
|    |                                                                                                           |                                                                                                                                                                                                                                                |                                                                                                                                                                                    |                                                                                                                                                                             |                                                                                                                                                         | · · · · · ·                                                                                                     |
| C. | In the abs<br>months pr<br>be put into                                                                    | ence of a certificate from<br>ior to the transfer, a seal<br>o use until tested.                                                                                                                                                               | a transferor indica<br>ed source or detec                                                                                                                                          | ting that a leak tes<br>tor cell received fro                                                                                                                               | st has been mad<br>om another pers                                                                                                                      | de within six<br>son shall not                                                                                  |
| D. | Each seal<br>leakage, a                                                                                   | ed source fabricated by t<br>and contamination prior to                                                                                                                                                                                        | he licensee shall b<br>o any use or transfe                                                                                                                                        | e inspected and te<br>er as a sealed sou                                                                                                                                    | ested for constru<br>irce.                                                                                                                              | uction defects,                                                                                                 |
| E. | Sealed sc                                                                                                 | ources and detector cells                                                                                                                                                                                                                      | need not be leak te                                                                                                                                                                | ested if:                                                                                                                                                                   | •<br>•                                                                                                                                                  |                                                                                                                 |
|    | (i) they                                                                                                  | contain only hydrogen-3                                                                                                                                                                                                                        | ; or                                                                                                                                                                               | ×92                                                                                                                                                                         |                                                                                                                                                         |                                                                                                                 |
|    | (ii) they                                                                                                 | contain only a radioactiv                                                                                                                                                                                                                      | e gas; or                                                                                                                                                                          |                                                                                                                                                                             |                                                                                                                                                         |                                                                                                                 |
|    | (iii) the                                                                                                 | nalf-life of the isotope is 3                                                                                                                                                                                                                  | 30 days or less; or                                                                                                                                                                |                                                                                                                                                                             | 8.<br>                                                                                                                                                  |                                                                                                                 |
|    | (iv) they<br>thar                                                                                         | contain not more than 1<br>10 microcuries of alpha                                                                                                                                                                                             | 90 microcuries of b<br>emitting material; c                                                                                                                                        | eta and/or gamma<br>or                                                                                                                                                      | a emitting mater                                                                                                                                        | ial or not more                                                                                                 |
|    | (v) they<br>whe<br>test<br>seal<br>test                                                                   | are not designed to emit<br>n they are removed from<br>ed within the required lea<br>ed source or detector cel<br>ed for leakage and/or cor                                                                                                    | alpha particles, ar<br>storage for use or<br>k test interval, they<br>I shall be stored fo<br>namination.                                                                          | e in storage, and a<br>transfer to anothe<br>shall be tested be<br>r a period of more                                                                                       | are not being us<br>aperson, and ha<br>fore use or tran<br>than 10 years v                                                                              | ed. However,<br>ave not been<br>isfer. No<br>vithout being                                                      |
| F  | The test s<br>test samp<br>contamin<br>detector of<br>of in acco<br>the leak t<br>Nuclear M<br>report sha | shall be capable of detect<br>le. If the test reveals the<br>ation, a report shall be file<br>cell shall be removed imm<br>rdance with Commission<br>est result is known with the<br>Materials Safety Branch, 4<br>all specify the source or d | ing the presence of<br>presence of 0.005<br>ed with the U.S. Nu<br>nediately from servi<br>regulations. The r<br>he U.S. Nuclear Re<br>175 Allendale Road<br>letector cell involve | f 0.005 microcurie<br>microcurie or mor<br>clear Regulatory C<br>ce and decontami<br>eport shall be filed<br>gulatory Commiss<br>, King of Prussia,<br>d, the test results, | of radioactive n<br>re of removable<br>Commission and<br>nated, repaired,<br>I within five days<br>ion, Region I, A<br>Pennsylvania 1<br>and corrective | naterial on the<br>I the source or<br>or disposed<br>s of the date<br>TTN: Chief,<br>9406. The<br>action taken. |
| G. | The licen<br>tests for I<br>Commiss                                                                       | see is authorized to collec<br>eakage and/or contamina<br>ion or an Agreement Stat                                                                                                                                                             | ct leak test sample<br>ation may be perfor<br>te to perform such                                                                                                                   | s for analysis by th<br>med by persons s<br>services.                                                                                                                       | e licensee. Alte<br>pecifically licens                                                                                                                  | ernatively,<br>sed by the                                                                                       |
|    | Dupl                                                                                                      | icate •                                                                                                                                                                                                                                        | Duplica                                                                                                                                                                            | tte                                                                                                                                                                         | Duplic                                                                                                                                                  | ate                                                                                                             |

| NRC        | FORM 374A                                                                        | U.S. NUCLEAR REG                                                                                                                | GULATORY COMMISSION                                                                          |                                                                                 | PAGE 6                                                          | 6 of 7                                                  | PAGES                             |
|------------|----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|-----------------------------------------------------------------|---------------------------------------------------------|-----------------------------------|
|            | Dupl                                                                             | Cate<br>MATERIALS LICENS<br>SUPPLEMENTARY SHEE                                                                                  |                                                                                              | License Number<br>08-01738-02<br>Docket or Reference N<br>030-01317             | Number                                                          |                                                         | <u>h</u>                          |
|            |                                                                                  |                                                                                                                                 | •                                                                                            | Amendment No.                                                                   | 76                                                              | ·····                                                   |                                   |
|            |                                                                                  |                                                                                                                                 |                                                                                              | <u></u>                                                                         |                                                                 |                                                         | · · · · · · ·                     |
| 17.        | Sealed source h                                                                  | es or detector cells conta<br>olders by the licensee.                                                                           | aining licensed mate                                                                         | rial shall not be o                                                             | pened or sou                                                    | rces remo                                               | ved                               |
| 18.        | The licensee<br>Sulfur 35, Co<br>provided:                                       | is authorized to hold radi<br>balt 58, Iridium 192, Sca                                                                         | ioactive material with<br>ndium 46, for decay-                                               | a physical half-li<br>in-storage before                                         | ife of less tha<br>disposal in d                                | n 65 days<br>ordinary tra                               | and<br>ash,                       |
|            | A. Waste to                                                                      | be disposed of in this m                                                                                                        | lanner shall be held.                                                                        | or decay a minim                                                                | num of ten ha                                                   | alf-lives.                                              |                                   |
|            | B. Before d<br>appropria<br>determin<br>removed                                  | sposal as ordinary trash<br>ate survey instrument set<br>e that its radioactivity ca<br>or obliterated.                         | , the waste shall be s<br>t on its most sensitiv<br>nnot be distinguished                    | surveyed at the co<br>e scale and with r<br>d from backgroun                    | ontainer surfa<br>no interposec<br>nd. All radiati              | ace with th<br>I shielding<br>on labels s               | e<br>to<br>shall be               |
|            | C. A record<br>years. T<br>placed in<br>the dose<br>performe                     | of each such disposal po<br>he record must include t<br>storage, the radionuclid<br>rate measured at the su<br>of the disposal. | ermitted under this L<br>he date of disposal,<br>es disposed, the sur<br>rface of each waste | icense Condition<br>the date on which<br>vey instrument us<br>container, and th | shall be reta<br>i the byprodu<br>sed, the back<br>e name of th | ined for thi<br>Ict materia<br>ground do<br>e individua | ree<br>I was<br>se rate,<br>I who |
| 19.<br>20. | The licensee<br>prescriptive a<br>35.100, 35.20<br>Experimental<br>materials sha | shall possess and use b<br>nd performance criteria i<br>00, and 35.300.<br>animals, or the products<br>Il not be used for human | yproduct material for<br>n'all sections of 10 (<br>from experimental a<br>consumption.       | human research<br>CFR Part 35 exce<br>unimals, that have                        | in accordanc<br>pt sections 3<br>been admin                     | ce with the<br>5.49(a) an<br>istered lice               | d (b),<br>ensed                   |
| 21.        | The licensee<br>10 CFR Part                                                      | is authorized to transpor<br>71, "Packaging and Tran                                                                            | t licensed material in<br>asportation of Radioa                                              | accordance with<br>ctive Material."                                             | the provisior                                                   | ns of                                                   |                                   |
| 22.        | The licensee<br>has been reg<br>equivalent reg                                   | shall not acquire licensed<br>istered with the U.S. Nuc<br>gulations of an Agreeme                                              | d material in a sealed<br>lear Regulatory Com<br>nt State.                                   | d source or device<br>nmission pursuan                                          | e unless the<br>t to 10 CFR 3                                   | source or o<br>32.210 or                                | levice                            |
| 23.        | Radioactive v<br>procedures ir<br>September 9                                    | vaste generated shall be<br>cluded with the waste st<br>1993 and October 29, 1                                                  | stored in accordance<br>orage plan described<br>993.                                         | e with the statem<br>I in the licensee's                                        | ents, represe<br>letter/applica                                 | ntations, a<br>ation dated                              | nd                                |
|            |                                                                                  |                                                                                                                                 |                                                                                              |                                                                                 |                                                                 |                                                         |                                   |
|            | Dupl                                                                             | icate =                                                                                                                         | Duplica                                                                                      | te s                                                                            | Dupl                                                            | icate                                                   |                                   |
|            |                                                                                  |                                                                                                                                 |                                                                                              |                                                                                 |                                                                 | · · · ·                                                 |                                   |

| NRC FORM 374A                                                                                                                                                                                                                                 | U.S. NUULEAR REGULATORY                                                                                                                                                  | COMMISSION                                                                                                      | PAGE 7 of 7 PAGES                                                                                                                                                                                                              |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Duplical                                                                                                                                                                                                                                      | ERIALS LICENSE                                                                                                                                                           |                                                                                                                 | icense Number<br><u>8-01738-02</u><br>iocket or Reference Number<br>i30-01317                                                                                                                                                  |
|                                                                                                                                                                                                                                               |                                                                                                                                                                          | A                                                                                                               | Amendment No. 76                                                                                                                                                                                                               |
| 24. Notwithstanding the rooms used to hous procedures containe                                                                                                                                                                                | requirements of 10 CFR 3<br>e radiopharmaceutical ther<br>ed in the letters dated April                                                                                  | 5.315(a)(7), t<br>apy patients i<br>8, 1992 and l                                                               | he licensee may control contamination in<br>n accordance with the commitments and<br>November 24, 1992.                                                                                                                        |
| 25. Except as specifical<br>accordance with the<br>any enclosures, liste<br>provided in 10 CFR<br>the statements, repr<br>more restrictive thar                                                                                               | ly provided otherwise in this<br>statements, representation<br>ed below, except for minor<br>35.31. The U.S. Nuclear F<br>esentations, and procedure<br>the regulations. | s license, the<br>ns, and proce<br>changes in th<br>legulatory Co<br>es in the licer                            | licensee shall conduct its program in<br>dures contained in the documents, including<br>e medical use radiation safety procedures as<br>mmission's regulations shall govern unless<br>see's application and correspondence are |
| <ul> <li>A. Application data</li> <li>B. Letter dated Sec.</li> <li>C. Letter dated Oc</li> <li>D. Letter dated De</li> <li>E. Letter dated Fe</li> <li>F. Letter dated Ju</li> <li>G. Letter dated De</li> <li>H. Letter dated Au</li> </ul> | ed January 21, 1993<br>ptember 9, 1993<br>ctober 29, 1993<br>ccember 9, 1993<br>bruary 15, 1994<br>ne 2, 1994<br>ccember 6, 1996<br>gust 13, 2003                        |                                                                                                                 |                                                                                                                                                                                                                                |
|                                                                                                                                                                                                                                               |                                                                                                                                                                          |                                                                                                                 |                                                                                                                                                                                                                                |
|                                                                                                                                                                                                                                               |                                                                                                                                                                          | For the U.S.                                                                                                    | Nuclear Regulatory Commission                                                                                                                                                                                                  |
| Date <u>May 26, 2004</u>                                                                                                                                                                                                                      |                                                                                                                                                                          | <i>Origi</i><br>By<br>Jame                                                                                      | nal signed by James P. Dwyer<br>s P. Dwyer                                                                                                                                                                                     |
| Duplica                                                                                                                                                                                                                                       | te 🔹 Du                                                                                                                                                                  | Nucle<br>Divisi<br>Regic<br>King                                                                                | ar Materials Safety Branch 1<br>on of Nuclear Materials Safety<br>ph<br>of Prussia, Pennsylvania 19406-ate                                                                                                                     |
|                                                                                                                                                                                                                                               | <u></u>                                                                                                                                                                  | -The contract of the second |                                                                                                                                                                                                                                |



DEPARTMENT OF THE ARMY WALTER REED ARMY MEDICAL CENTER 6900 GEORGIA AVE NW WASHINGTON DC 20307-5001

REPLY TO ATTENTION OF: Office of the Deputy Commander for Clinical Services

U.S. Nuclear Regulatory Commission Region I ATTN: Nuclear Materials Safety Branch 475 Allendale Road King of Prussia, PA 19406-1415

03001317 (RENEW)

135458

1-5

Dear Sir or Madam:

Enclosed is the Walter Reed Army Medical Center NRC broad scope license 10-year renewal application (Form 313 with attachments). Our current license, No. 08-01738-02, is set to expire on 30 June 2004. Hence, this application is hereby rendered within the 30-day timeliness rule.

Please note that the renewal application for the broad scope license includes provisions to absorb our irradiator license, No. 08-01738-03. Our intent is to consolidate both licenses. 08-01738-02 135048 (TEAM) 03006895 (AMEND) 03001317 Your point of contact for this Command is Lieutenant Colonel John Mercier, Ph.D., (202) 356-0058.

Sincerely,

Thomas M. Fitzpatrick Colonel, Medical Corps Deputy Commander for Clinical Services

Enclosure

Copy Furnished: Headquarters, US Army Medical Command, ATTN: POPM-SA, Fort Sam Houston, TX 78234.

latormation in this record was deleted in accordance with the Freedom of Information Act, exemptions: 2+4FOIA- 2006-03-3

135 458

NMSS/RGNI MATERIALS-002 SCHARATED OUT OF 135047 8/10/2

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| CFR 30, 32, 33,<br>1, 35, 36, 39, and 40                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        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                                       |                                                                                                                                                                                                                                                                                                                                           | Branch (T-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 205                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            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                                       |                                                                                                                                                                                                                                                                                                                                           | or by internet e-mail to infocollects@nrc.gov, and to the Desk Officer, (<br>Information and Regulatory Affairs, NEOB-10202, (3150-0120), Office of Man                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             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If a means used to impose an info<br>collection does not display a currently valid OMB control number, the NRC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
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| OFFICE OF NUCI<br>U.S. NUCLEAR R                                                                                                                                                                                                                                                                                                                                                              | LEAR MATERIALS SAFE<br>REGULATORY COMMIS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               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                                       | IMBIA, FLORIDA, GEORGIA,<br>SIPPI, NEW HAMPSHIRE, NE                                                                                                                                                                                                                                                                                      | ALASKA, ARIZONA, ARKANSAS, CALIFORNIA, COLORADO, HAWAII, IDAHO, KANS<br>EW LOUISIANA, MONTANA, NEBRASKA, NEVADA, NEW MEXICO, NORTH DAKOTA, OKI                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      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| WEST VIRGINIA, SE                                                                                                                                                                                                                                                                                                                                                                             | END APPLICATIONS TO                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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NAME AND MAILING ADDRESS OF APPLICANT (Include ZIP code)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
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NAME OF PERSON TO BE CONTACTED ABOUT THIS APPLICATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| C. 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NAME OF PERSON TO BE CONTACTED ABOUT THIS APPLICATION     LTC John Mercier, Ph,D., RSO                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| C. REI<br>3. ADDRESS WHE<br>SEE ITEM                                                                                                                                                                                                                                                                                                                                                          | NEWAL OF LICENSE M<br>TRE LICENSED MATERI<br>#3 ATTACHME                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | AL WILL BE USED O                                                                                                                                                                                                                                                                                                             | OR POSSESSED                                                                                                                                                                                                                                                                                                                              | Washington, DC 20307-5001     A. NAME OF PERSON TO BE CONTACTED ABOUT THIS APPLICATION     LTC John Mercier, Ph,D., RSO     TELEPHONE NUMBER                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| C. REI<br>3. ADDRESS WHE<br>SEE ITEM                                                                                                                                                                                                                                                                                                                                                          | NEWAL OF LICENSE M<br>TRE LICENSED MATERI<br>#3 ATTACHME                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | ENT                                                                                                                                                                                                                                                                                                                           | OR POSSESSED                                                                                                                                                                                                                                                                                                                              | Washington, DC 20307-5001     A. NAME OF PERSON TO BE CONTACTED ABOUT THIS APPLICATION     LTC John Mercier, Ph,D., RSO     TELEPHONE NUMBER     (202) 356-0058                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| C. REI<br>3. ADDRESS WHE<br>SEE ITEM                                                                                                                                                                                                                                                                                                                                                          | NEWAL OF LICENSE M<br>RELICENSED MATER                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | INDER <u>US-1</u><br>IAL WILL BE USED (                                                                                                                                                                                                                                                                                       | OR POSSESSED                                                                                                                                                                                                                                                                                                                              | Washington, DC 20307-5001     A. NAME OF PERSON TO BE CONTACTED ABOUT THIS APPLICATION     LTC John Mercier, Ph,D., RSO     TELEPHONE NUMBER     (202) 356-0058                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| C. REI<br>3. ADDRESS WHE<br>SEE ITEM                                                                                                                                                                                                                                                                                                                                                          | NEWAL OF LICENSE MATERI<br>RELICENSED MATERI<br>#3 ATTACHME<br>THROUGH 11 ON 8-12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | AL WILL BE USED (<br>ENT<br>X11" PAPER: THE                                                                                                                                                                                                                                                                                   | OR POSSESSED                                                                                                                                                                                                                                                                                                                              | Washington, DC 20307-5001     Washington, DC 20307-5001     A. NAME OF PERSON TO BE CONTACTED ABOUT THIS APPLICATION     LTC John Mercier, Ph,D., RSO     TELEPHONE NUMBER     (202) 356-0058 RMATION TO BE PROVIDED IS DESCRIBED IN THE LICENSE APPLICATION GUIDE.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| C. REI<br>3. ADDRESS WHE<br>SEE ITEM<br>SUBMIT ITEMS 5 1<br>5. RADIOACTIVE<br>8. Element and                                                                                                                                                                                                                                                                                                  | NEWAL OF LICENSE M<br>RE LICENSED MATERI<br>#3 ATTACHME<br>THROUGH 11 ON 8-1/2<br>MATERIAL<br>I mass number; b. chemi                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | AL WILL BE USED (<br>ENT<br>X11" PAPER: THE<br>cal and/or physical for                                                                                                                                                                                                                                                        | OR POSSESSED<br>TYPE AND SCOPE OF INFOR                                                                                                                                                                                                                                                                                                   | Washington, DC 20307-5001     Washington, DC 20307-5001     A. NAME OF PERSON TO BE CONTACTED ABOUT THIS APPLICATION     LTC John Mercier, Ph,D., RSO     TELEPHONE NUMBER     (202) 356-0058 RMATION TO BE PROVIDED IS DESCRIBED IN THE LICENSE APPLICATION GUIDE.     6. PURPOSE(S) FOR WHICH LICENSED MATERIAL WILL BE USED.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| C. REI<br>3. ADDRESS WHE<br>SEE ITEM<br>SUBMIT ITEMS 5 1<br>5. RADIOACTIVE<br>a. Element and<br>which will be<br>7. INDIVIDIAL(S)                                                                                                                                                                                                                                                             | NEWAL OF LICENSE M<br>RE LICENSED MATERI<br>#3 ATTACHME<br>THROUGH 11 ON 8-12<br>MATERIAL<br>Imass number, b. chemit<br>possessed at any one to<br>RESPONSIBILE FOR P.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | INT<br>X11" PAPER THE<br>cal and/or physical for<br>me.<br>ADIATION SAFETY                                                                                                                                                                                                                                                    | TYPE AND SCOPE OF INFOR                                                                                                                                                                                                                                                                                                                   | Washington, DC 20307-5001     Washington, DC 20307-5001     A. 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INDIVIDUAL(S)<br>TRAINING EXP                                                                                                                                                                                                                                             | NEWAL OF LICENSE M<br>RELICENSED MATERI<br>#3 ATTACHME<br>THROUGH 11 ON 8-1/2<br>MATERIAL<br>I mass number, b. chemic<br>possessed at any one in<br>RESPONSIBLE FOR R<br>ERIENCE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | AL WILL BE USED (<br>ENT<br>X11" PAPER: THE<br>cal and/or physical fo<br>ime.<br>ADIATION SAFETY                                                                                                                                                                                                                              | TYPE AND SCOPE OF INFOR                                                                                                                                                                                                                                                                                                                   | Washington, DC 20307-5001     Washington, DC 20307-5001     A. 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FACILITIES AN                                                                                                                                                                                                           | NEWAL OF LICENSE MATERI<br>THE LICENSED MATERI<br>#3 ATTACHME<br>THROUGH 11 ON 8-1/2<br>MATERIAL<br>POSSESSED at any one in<br>RESPONSIBLE FOR R<br>PERIENCE<br>ID EQUIPMENT.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | IAL WILL BE USED (<br>ENT<br>X11" PAPER THE<br>cal and/or physical fo<br>ime.<br>ADIATION SAFETY                                                                                                                                                                                                                              | OR POSSESSED<br>TYPE AND SCOPE OF INFOR<br>orm; and c. makimum amount<br>PROGRAM AND THEIR                                                                                                                                                                                                                                                | <ul> <li>Washington, DC 20307-5001</li> <li>NAME OF PERSON TO BE CONTACTED ABOUT THIS APPLICATION         <ul> <li>LTC John Mercier, Ph,D., RSO</li> <li>TELEPHONE NUMBER</li> <li>(202) 356-0058</li> </ul> </li> <li>RMATION TO BE PROVIDED IS DESCRIBED IN THE LICENSE APPLICATION GUIDE.</li> <li>PURPOSE(S) FOR WHICH LICENSED MATERIAL WILL BE USED.</li> <li>TRAINING FOR INDIVIDUALS WORKING IN OR FREQUENTING RESTRICTED ARE</li> <li>10. 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IO CFR 170 (A) (CFR 170 (A))</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
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LICENSE FEES (See 10 CFR 170 and Section 170.31) / O C FTR 170 (A)(C FEE CATEGORY 7B AMOUNT STATEMENTS AND REPRESENTATIONS MADE IN THIS APPLICATION ARE BIN     THAT ALL STATEMENTS AND REPRESENTATIONS MADE IN THIS APPLICATION ARE BIN     OF THE APPLICANT, NAMED IN ITEM 2, CERTIFY THAT THIS APPLICATION IS PREPARE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
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(Must be completed<br>ICANT.<br>INT AND ANY OFFICIAL<br>Y WITH TITLE 10, CODE<br>THE REST OF THEID                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | ADUATION SAFETY                                                                                                                                                                                                                                                                                                               | TYPE AND SCOPE OF INFOR<br>mm; and c. makimum amount<br>PROGRAM AND THEIR<br>APPLICANT UNDERSTANDS<br>CERTIFICATION ON BEHALF<br>ULATIONS, PARTS 30, 32, 33<br>BELIEF.                                                                                                                                                                    | Washington, DC 20307-5001     Washington, DC 20307-5001     A. 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SECTION 1001                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | AL WILL BE USED (<br>AL WILL BE USED (<br>ENT<br>X11" PAPER: THE<br>cal and/or physical for<br>ime.<br>ADIATION SAFETY<br>d by applicant) THE<br>EXECUTING THIS<br>E OF FEDERAL REG<br>KNOWLEDGE AND<br>I ACT OF JUNE 25, (                                                                                                   | TYPE AND SCOPE OF INFOR<br>mm; and c. mabdmum amount<br>PROGRAM AND THEIR<br>APPLICANT UNDERSTANDS<br>CERTIFICATION ON BEHALF<br>SULATIONS, PARTS 30, 32, 33<br>BELIEF.<br>1948 62 STAT. 749 MAKES IT J                                                                                                                                   | Washington, DC 20307-5001     Washington, DC 20307-5001     Ame of person to be contacted about this application     LTC John Mercier, Ph,D., RSO     TELEPHONE NUMBER     (202) 356-0058     RMATION TO BE PROVIDED IS DESCRIBED IN THE LICENSE APPLICATION GUIDE.     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FiltZDA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | ADIATION SAFETY<br>d by applicant) THE<br>EXECUTING THIS<br>EXECUTING THIS<br>EXECUTING THIS<br>E OF FEDERAL REG<br>KNOWLEDGE AND<br>I ACT OF JUNE 25,<br>THE UNITED STAT<br>ED NAME AND TITL<br>trick . M.                                                                                                                   | TYPE AND SCOPE OF INFOR<br>TYPE AND SCOPE OF INFOR<br>sm; and c. makimum amount<br>PROGRAM AND THEIR<br>APPLICANT UNDERSTANDS<br>CERTIFICATION ON BEHALF<br>SULATIONS, PARTS 30, 32, 33<br>BELIEF.<br>1948 62 STAT. 749 MAKES IT J.<br>1948 62 STAT. 749 MAKES IT J.<br>E B-7007Y CDJ<br>D, FOR CLIV. SVA                                 | Washington, DC 20307-5001     Washington, DC 20307-5001     A. NAME OF PERSON TO BE CONTACTED ABOUT THIS APPLICATION     LTC John Mercier, Ph,D., RSO     TELEPHONE NUMBER     (202) 356-0058     RMATION TO BE PROVIDED IS DESCRIBED IN THE LICENSE APPLICATION GUIDE.     6. PURPOSE(S) FOR WHICH LICENSED MATERIAL WILL BE USED.     8. TRAINING FOR INDIVIDUALS WORKING IN OR FREQUENTING RESTRICTED ARE     10. RADIATION SAFETY PROGRAM.     12. 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## ITEM #3 ATTACHMENT ADDRESSES WHERE LICENSED MATERIAL WILL BE USED OR POSSESSED

Walter Reed Army Medical Center (WRAMC), Washington, D.C.; WRAMC Forest Glen Section and Annex, Silver Spring, Maryland; U.S. Army Medical Laboratory, Fort Meade, Maryland; Rickman Building, 13 Taft Court, Rockville, Maryland; and The Gillette Building, 1413 Research Boulevard, Rockville, Maryland. NRC License 08-01738-02 R wal Application

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### ITEMS #5 and #6 ATTACHMENT RADIOACTIVE MATERIAL and PURPOSES FOR WHICH LICENSED MATERIAL WILL BE USED

| CHEMICAL AND<br>MASS NUMBER                              | CHEMICAL AND<br>PHYSICAL FORM | MAXIMUM<br><u>ACTIVITY</u>                                                          | AUTHORIZED USE                                                                                   |
|----------------------------------------------------------|-------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|
| A. Any byproduct<br>Material with atomic<br>numbers 3-83 | A. Any                        | A. 400 mCi of each<br>radionuclide with a<br>total possession limit<br>of 26 curies | A. Through R.<br>Medical research,<br>diagnosis, and<br>therapy: research and                    |
|                                                          |                               |                                                                                     | development as<br>defined in 10 CFR<br>30.4; instrument<br>calibration; teaching<br>and training |
| B Any byproduct                                          | B. Anv                        | B. 100 mCi of each                                                                  | and training                                                                                     |
| Material with atomic                                     |                               | radionuclide with a                                                                 |                                                                                                  |
| numbers 84-96                                            |                               | total possession limit                                                              |                                                                                                  |
|                                                          |                               | of 1 curie                                                                          |                                                                                                  |
| C. Iodine 131                                            | C. Any                        | C. 2 curies                                                                         |                                                                                                  |
| D. Xenon 133                                             | D. Any                        | D. 2 curies                                                                         |                                                                                                  |
| E. Krypton 85                                            | E. Any                        | E. 1 curie                                                                          |                                                                                                  |
| F. Phosphorus 32                                         | F. Any                        | F. 2 curies                                                                         |                                                                                                  |
| G. Carbon 14                                             | G. Any                        | G. 2 curies                                                                         |                                                                                                  |
| H. Iodine 125                                            | H. Any                        | H. 1 curie                                                                          |                                                                                                  |
| I. Iridium 192                                           | I. Any                        | <b>I.</b>                                                                           |                                                                                                  |
| J. Chromium 51                                           | J. Any                        | J. 1 curie                                                                          |                                                                                                  |
| K. Sulfur 35                                             | K. Any                        | K. 1 curie                                                                          |                                                                                                  |
| L. Hydrogen 3                                            | L. Any                        | L. 5 curies                                                                         |                                                                                                  |
| M. Molybdenum 99                                         | M. Molybdenum                 | M. 23 curies                                                                        |                                                                                                  |
|                                                          | 99/Technetium                 |                                                                                     |                                                                                                  |
|                                                          | 99m Generators                |                                                                                     |                                                                                                  |
| N. Technetium 99m                                        | N. Any                        | N. 23 curies                                                                        |                                                                                                  |
| O. Strontium 90                                          | O. Sealed sources             |                                                                                     |                                                                                                  |
| P. Cesium 137                                            | P. Sealed sources             | P.                                                                                  |                                                                                                  |
| Q. Gadolinium 153                                        | Q. Sealed sources             | Q                                                                                   | •                                                                                                |
| R. Iodine 125                                            | R. Sealed sources             | R. 500 mCi                                                                          |                                                                                                  |
|                                                          |                               |                                                                                     |                                                                                                  |
|                                                          |                               |                                                                                     |                                                                                                  |
|                                                          |                               |                                                                                     |                                                                                                  |
|                                                          |                               | <u> </u>                                                                            |                                                                                                  |

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| CHEMICAL AND<br>MASS NUMBER                               | CHEMICAL AND<br>PHYSICAL FORM         | MAXIMUM<br><u>ACTIVITY</u>                                                                                    | AUTHORIZED USE                                                                                                                                                                                       |
|-----------------------------------------------------------|---------------------------------------|---------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| S. Cesium 137<br>U. Thorium<br>V. Uranium                 | S. Sealed sources<br>U. Any<br>V. Any | S.<br>U. 5 kgms<br>V. 50 kgms                                                                                 | S. through V.<br>Research and<br>development as<br>defined in 10 CFR<br>30.4; instrument<br>calibration; teaching<br>and training                                                                    |
| W. Uranium depleted<br>in Uranium 235<br>X. Americium 241 | W. Plated metal<br>X. Sealed source   | W. 900 kgms<br>X.                                                                                             | <ul> <li>W. Shielding;<br/>instrument<br/>calibration; teaching<br/>and training</li> <li>X. Standard and<br/>reference source;<br/>instrument<br/>calibration; teaching<br/>and training</li> </ul> |
| Y. Cesium 137                                             | Y. Sealed sources                     | Y.                                                                                                            | Y. Instrument<br>calibration; teaching<br>and training                                                                                                                                               |
| Z. Cesium 137<br>AA. Cesium 137                           | Z. Sealed sources                     | Z. per<br>source with a total<br>possession limit of<br>AA. per<br>source with a total<br>possession limit of | Z. through BB.<br>Self-shielded<br>irradiators for use as<br>described in<br>respective SSD<br>registration<br>certificates                                                                          |
| BB. Cobalt 60                                             | BB. Sealed sources                    | BB. per<br>source with a total<br>possession limit of                                                         |                                                                                                                                                                                                      |

The NRC recently completed a satisfactory review of our Financial Assurance Submittal with Statement of Intent and Decommissioning Funding Plan [Refer to NRC letter dated April 13, 2004, signed by the Chief of the Region I Nuclear Materials Safety Branch, NRC Control Nos. 132079 and 132080].

EX 2 portions

#### **ITEM #7 ATTACHMENT**

#### INDIVIDUALS RESPONSIBLE FOR RADIATION SAFETY PROGRAM

1. A NRC Form 313A, curriculum vitae and copy of board certification for the Radiation Safety Officer (RSO), LTC John R. Mercier, Ph.D., is attached.

2. For human use (e.g., diagnosis, therapy and human studies), licensed material shall be used by or under the supervision of individuals designated by the Walter Reed Army Medical Center (WRAMC) Radiation Safety Committee (RSC). The training and experience of authorized users, authorized nuclear pharmacists, and authorized medical physicists will be evaluated using the criteria in 10 CFR 35. The RSC, with RSO approval, may grant case-by-case exceptions.

3. For non-human use (e.g., research and development), Principle Investigators and Co-Investigators who meet training and experience criteria expressed in NUREG 1556, Volume 7, Section 8.7.2 (December 1999), may be designated as authorized users by the RSO. The RSC, with RSO approval, may grant case-by-case exceptions.

4. For self-shielded irradiators, personnel who meet training and experience criteria expressed in NUREG 1556, Volume 5, Appendix G (October 1998), will be designated as authorized users by the RSO. The RSC, with RSO approval, may grant case-by-case exceptions.

5. 10CFR35.24(c) Waiver. To meet military operational contingencies, support homeland security missions, or support national security objectives, the RSO may be sent on extended deployments (60 to 180 days) without warning. The RSO need not be present as long as communications between the RSO and WRAMC management can be maintained (e.g., phone, email, video teleconferencing, etc.). In such cases, the RSC will designate an acting RSO who meets the training and experience criteria in 10CFR35. Since WRAMC has sufficient depth in authorized users and professional health physics staff, the RSO can ensure that one or more authorized users or staff health physicists are fully qualified to serve as acting RSO via a signed preceptor statement (NRC 313A). In the event communications cannot be maintained, 10CFR35.24(c) will apply starting from the time that communications fail.

6. Except for appointment of a permanent RSO, the RSC maintains authority for designating the responsible radioactive material users (i.e., authorized users, authorized medical physicists, and authorized nuclear pharmacists). The criterion used by the RSC in approving users is taken from the appropriate NUREG 1556 series. As well, RSO approval is required.

7. The RSC also controls it's own membership to allow for personnel turnover, as well as, gains and losses in functional use of radioactive material. The majority of members are trained and experienced in the safe use of radioactive material. The minimum voting membership of the RSC tends to be the Deputy Commander for Clinical Services (DCCS, Chair and Management Rep), the RSO, a staff health physicist, a staff radiation therapy physicist, a nuclear pharmacy representative, a nuclear medicine representative, a nursing representative, a Walter Reed Army Institute of Research (WRAIR) representative and an Armed Forces Institute of Pathology (AFIP) representative. A quorum requires at least half the voting members, of which, the RSO, the nursing representative and the DCCS (or his management substitute) must attend.

#### ITEM #8 ATTACHMENT TRAINING FOR INDIVIDUALS WORKING IN OR FREQUENTING RESTRICTED AREAS

The radiation safety training program is managed by the WRAMC Health Physics Office and is designed to ensure compliance with 10CFR 19, 20, 30 and 35. Workers likely to receive an annual occupational dose in excess of 1 mSv (100 mrem) receive initial and refresher training commensurate with their duties. To ensure the training is tailored for different audiences and/or targeted for site-specific functions, the Health Physics staff often refines radiation safety lectures and training materials. However, research staffs receive training that generally follows NUREG 1556, Volume 7, Appendix J (December 1999) and medical staffs receive training that generally follows NUREG 1556, Volume 9, Appendix J (October 2002). The RSO maintains authority to approve changes to the radiation safety training program. The radiation safety training program may be examined in detail during routine NRC inspections.

#### ITEM #9 ATTACHMENT FACILITIES AND EQUIPMENT

1. Irradiators. WRAMC will ensure that each area where a self-shielded irradiator is located corresponds to the 'Conditions of Normal Use' and 'Limitations and/or Other Considerations of Use' on the respective irradiator Sealed Source and Device (SSD) Registration Certificate; the floor beneath each self-shield irradiator is adequate to support the weight of the irradiator; each self-shielded irradiator is secured to prevent unauthorized access or removal; and each area where a self-shielded irradiator is located is equipped with an automatically operated fire detection and control system (sprinkler, chemical, or gas) or the location of the area and other controls ensure a low-level radiation risk attributable to fires. Currently, the self-shielded irradiators are located as follows:

Georgia Ave., Washington, D.C.

B ..... Forrest Glen Annex, Silver Spring. MD.

C. \_\_\_\_\_ Glen Annex, Silver Spring, MD. WRAMC Building 2, 6900 Building 503 (WRAIR), Building 503 (WRAIR), Forrest

Procedures for routine maintenance of the self-shielded irradiators that follow manufacturer's written instructions are implemented and maintained. Non-routine maintenance is only performed by the irradiator manufacturer or by other persons authorized by the NRC or an Agreement State.

2. Facilities. The Radiation Safety Committee (RSC) maintains authority for approving radioactive material use, storage and waste facilities. Facilities are evaluated on their adequacy to protect health and minimize danger to life and property IAW 10CFR 30.33(a)(2) and 35.18(a)(3). As appropriate, the RSC considers factors such as ALARA design, planned use of facility, type and quantity of radioactive material, protective equipment, access control, contamination control, ventilation, filtration, shielding, alarms and radiation monitoring instruments when evaluating a facility for licensed activities. Isotope laboratories and use areas tend to have impervious floors walls and countertops. Facility diagrams are attached for the Radiopharmacy Hot Lab, and the Radiation Therapy Sealed Source Storage Room

Building 2, WRAMC. Additional laboratory and facility diagrams may be examined during routine NRC inspections.

3. Instruments. To ensure compliance with 10CFR 20 and 35 requirements, WRAMC maintains a variety of radiation monitoring and survey instruments, as well as, gamma well counters and liquid scintillation counters. Radiation monitoring instruments will be calibrated by the manufacturer or other appropriately qualified person, business or agency. Additionally, WRAMC reserves the right to develop and implement survey meter calibration procedures compliant with 10CFR 20.1501 and 35.61. The RSO maintains authority for amending instrument specifications and the calibration program.

4. Dose Calibrators. Equipment used to measure dosages will be calibrated IAW nationally recognized standards or the manufacturer's instructions.

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#### ITEM #10 ATTACHMENT RADIATION SAFETY PROGRAM

1. Audit Program. In accordance with 10CFR 20.1101, the RSO evaluates, or arranges for guest auditors to evaluate, the radiation safety program at least once a year. Executive management and the RSC are briefed on the results of each audit. Audit findings are addressed and tracked to resolution by the RSO and/or the RSC. The RSO maintains authority for amending the audit program.

2. Material Receipt and Accountability. In accordance with 10CFR 20, 30 and 33, WRAMC has established cradle-to-grave tracking of radioactive materials. For non-exempt sealed sources, physical inventories are conducted at least every six months.

3. Occupational Dose. Occupational doses at WRAMC have been tracked for many years and are well known for the various occupational groups. Unmonitored workers are not likely to exceed 10% the allowable annual limits specified in 10CFR 20. Externally dosed workers specified by 10CFR 20.1502(a) will enter the dosimetry program and receive an extremity and/or whole body dosimeter. Internally dosed workers specified by 10CFR 20.1502(b) will enter the dosimetry specified by 10CFR 20.1502(b) will enter the dosimetry program and be assessed for internal uptake via bioassay. Dosimetry services, currently provided by the Army, are NVLAP accredited.

4. Area Surveys. WRAMC has developed and implemented written procedures for area surveys IAW 10CFR 20.1101 that meets the requirements of 10CFR 20.1501 and 35.70.

5. Safe Use of Unsealed Radioactive Material. WRAMC has developed and implemented written procedures for safe use of unsealed licensed material that meets the requirements of 10CFR 20.1101 and 20.1301.

6. Spill Procedures. WRAMC has developed and implemented written procedures for safe response to spills of licensed material that meets the requirements of 10CFR 20.1101

7. Leak Tests. WRAMC has developed and implemented written procedures for leak tests that meet the requirements of 10CFR 20 and 35.67.
NRC License 08-01738-02 Rei /al Application

# ITEM #11 ATTACHMENT WASTE MANAGEMENT

1. Procedures. WRAMC has developed and implemented written waste disposal procedures for licensed material IAW 10CFR 20.1101, that also meet to applicable section of Subpart K to 10CFR 20 and 10CFR 35.92. Disposal of the licensed material in the irradiators will be by transfer of the irradiators to the supplier or to a licensee authorized to accept the irradiators.

2. Facility. Attached is a diagram of the Radioactive Waste Facility, Building Forrest Glen Annex. Solid waste is shipped from this facility, liquid waste is sampled for release to the sewer from this facility, and short-lived waste is decayed and released at this facility. The building was originally designed, built and operated as a research reactor facility (decommissioned in 1979) with low vulnerability to hazards. The brick and concrete building is secured with locked metal doors, perimeter fence and locked gate. It has a forced circulation air system, heating and cooling system, alarm system, walk-in freezer, fire hydrant, and fire extinguisher.

## ITEMS #7 THROUGH #11 RADIATION SAFETY COMMITTEE BROAD SCOPE FLEXIBILTY

1. Except for NRC approval of the RSO, the Radiation Safety Committee (RSC) intends to continue to assume full decision and approval authority for all aspects of the broad scope license and radiation safety program. WRAMC has a long history of NRC compliance excellence and this, in part, is a result of the RSC having the authority to promptly address reach closure on issues that would otherwise enter a license amendment process. Under this renewal of the broad scope license, the WRAMC RSC requests continued flexibility by remaining exempt from submitting a multitude of license amendments related to Items #7 through #11. The criteria the RSC will use to approve new users, new procedures, new facilities and so forth, is the following:

A. The RSC decision must not be a detriment to safety, health, or the environment.

B. The criteria provided in the NUREG 1556 Series (e.g., Volumes 5, 7, 9 & 11), 10CFR20 through 10CFR35, NRC Information Notices, ANSI standards, or other appropriate references will serve a basis for the RSC's approval or disapproval decisions.

C. For all RSC decisions that directly affect the Radiation Safety Program, to include approval of radioactive material users, the RSO must be in agreement.

2. The RSC may also defer full decision authority for selected topics to the RSO. These are topics or programs that are exclusively, or nearly exclusively, the management purview of the RSO. For example, the RSO will maintain authority to approve changes to the radiation safety training program, for amending instrument specifications, and for amending the audit program.

|                                                                             | All NEC FOR 312                                        |                       | ion DL D. No. Con     |
|-----------------------------------------------------------------------------|--------------------------------------------------------|-----------------------|-----------------------|
| RC FORM 313A                                                                | WW NRC FOIT 313                                        | U.S. NUCLEAR REG      | ULATORY COMMISSION    |
| (1999)                                                                      | TRAINING AND EXPERIENCE                                |                       |                       |
|                                                                             |                                                        | • • •                 |                       |
| ote: Descriptions of training and expension in the application regulations. | rience must contain sufficient detail to r             | match the training an | d experience criteria |
| Name of Individual, Proposed Authorit                                       | zation (e.g. Radiation Safety Officer), a              | nd Applicable Trainin | g Requirements        |
| (e.g., 10CFR 35.50)                                                         |                                                        |                       |                       |
| LTC JOHN R. MERCIER, PH                                                     | I.D., PE, DABR, SRO                                    |                       | · · · ·               |
|                                                                             | •                                                      |                       |                       |
|                                                                             |                                                        |                       |                       |
| . For Physicians, State or Territory Whe                                    | ere Licensed                                           |                       |                       |
|                                                                             |                                                        |                       |                       |
|                                                                             |                                                        |                       | ·<br>·                |
|                                                                             | 3. CERTIFICATION                                       |                       |                       |
| Specialty Board                                                             | Category                                               | Month and             | Year Certified        |
|                                                                             |                                                        |                       |                       |
| American Board of Radiology                                                 | Diagnostic Radiological and<br>Medical Nuclear Physics | June, 1995            | · · · · ·             |
| Professional Engineer (Texas)                                               | Nuclear Engineering License                            | March, 1995           | •<br>•                |
|                                                                             | 4. DIDACTIC TRAINING                                   | <u> </u>              |                       |
| Description of Training                                                     | Location                                               | Clock Hours           | Dates of Training     |
|                                                                             | University of Texas at Austin                          | 300                   | Sep 81 – Dec 84       |
| Radiation Physics and Instrumentation                                       | Cornell University, NY                                 | 300                   | Aug 89 – May 91       |
|                                                                             | Univ. of Texas Health Science Center                   | 550                   | Aug 96 – Aug 99       |
|                                                                             | University of Texas at Austin                          | 50                    | Sep 81 – Dec 84       |
| Radiation Protection                                                        | Cornell University, NY                                 | 100                   | Aug 89 – May 91       |
|                                                                             | Univ. of Texas Health Science Center                   | 150                   | Aug 96 – Aug 99       |
|                                                                             | University of Texas at Austin                          | 200                   | Sep 81 – Dec 84       |
| Mathematics Pertaining to the Use and<br>Measurement of Radioactivity       | Cornell University, NY                                 | 150                   | Aug 89 - May 91       |
|                                                                             | Univ. of Texas Health Science Center                   | 100                   | Aug 96 - Aug 99       |
|                                                                             | University of Texas at Austin                          | 50                    | Sep 81 - Dec 94       |
|                                                                             |                                                        | 450                   |                       |
| Radiation Biology                                                           |                                                        | 150                   | Aug 89 – May 91       |
|                                                                             | Univ. of Texas Health Science Center                   | 150                   | Aug 96 – Aug 99       |
| Chemistry of Byproduct Material for                                         |                                                        |                       |                       |
| Medical Use                                                                 | Univ. of Texas Health Science Center                   | 100                   | Aug 96 – Aug 99       |
|                                                                             |                                                        |                       |                       |
|                                                                             | University of Texas at Austin                          | 50                    | Sep 81 – Dec 84       |
|                                                                             | Cornell University, NY                                 | 150                   | Aug 89 – May 91       |
| Radiation Dosimetry                                                         | Linix of Taxas Health Science Center                   | 150                   |                       |
|                                                                             |                                                        |                       |                       |

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| 5. PRACTICAL EXPERIENCE WITH RADITION (Actual use of radionuclides or equivalent experience)                                                                                                                                                       |                                      |                                                                                   |                                              |                                           |  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-----------------------------------------------------------------------------------|----------------------------------------------|-------------------------------------------|--|
| Description of Experience                                                                                                                                                                                                                          | Name of<br>Supervising<br>Individual | Location and<br>Corresponding<br>Material<br>License<br>Number                    | Dates and<br>Clock Hours<br>of<br>Experience | Related<br>Radiation Safety<br>Exam Score |  |
| Nuclear Medical Science Officer, U.S. Army<br>Environmental Hygiene Agency. Radiation<br>protection, dosimetry and calibration duties for.<br>Any byproduct material with atomic no.'s<br>1 – 84, any form, not to exceed 800 mCi                  | LTC Eugene Potter, CHP               | Aberdeen Proving<br>Ground, MD<br>USNRC Licenses:<br>#19-09880-01,<br>#SMB-707and | Jan 85 – Dec 85<br>(900 hours)               | N/A                                       |  |
| each or 10 Ci total.<br>Any byproduct material with atomic no.'s<br>1 – 100, any form, not to exceed 15 uCi<br>each or 500 uCi total.<br>J.L Shepard Cs-137 sealed 130 mCi<br>calibration source                                                   |                                      | #SNM-860                                                                          |                                              |                                           |  |
| Various plutonium and uranium sources.                                                                                                                                                                                                             |                                      | м.                                                                                |                                              |                                           |  |
| Radiation Safety Officer, Darnall Army<br>Community Hospital. Radiation protection,<br>dosimetry radioactive waste management, health<br>physics program management and calibration                                                                | MAJ Jerome Karwacki,M.D.             | Fort Hood, TX<br>USNRC License<br>#42-19113-01                                    | Jan 86 – Dec 88<br>(6000 hours)              | N/A                                       |  |
| duties for:<br>Any byproduct material with atomic no.'s<br>1 – 83 for use as radiopharmaceuticals in<br>diagnosis and therapy.<br>Various calibration sources.                                                                                     |                                      |                                                                                   |                                              |                                           |  |
|                                                                                                                                                                                                                                                    | <b>.</b>                             |                                                                                   |                                              | · · · ·                                   |  |
| Graduate Student, Cornell University.<br>Senior reactor operator for TRIGA reactor,<br>with 10 <sup>14</sup> neutron flux in core and 10 <sup>12</sup><br>neutron flux at beam ports.<br>Gamma cell operator with 10 MCi Co-60                     | Dr. K. Bingham Cady, Sc.D.           | Ithaca, NY<br>USNRC License<br>#SOP-10973                                         | Aug 89 - May 91<br>(1000 hours)              | N/A                                       |  |
|                                                                                                                                                                                                                                                    |                                      |                                                                                   |                                              |                                           |  |
| Project Engineer, Defense Nuclear Agency<br>Plutonium Mining Project. Spectroscopy,<br>calibration and respiratory protection duties for a<br>unique environmental restoration project.<br>Various plutonium and americium samples<br>and sources. | Dr. Ed Bramlitt, Ph.D.               | Johnston Island,<br>Pacific Ocean                                                 | Jun 91 – Jun 92<br>(1000 hours)              | N/A                                       |  |
| Radiation Safety Officer (Broad Scope), Tripler<br>Army Medical Center. Radiation protection,<br>dosimetry radioactive waste management, health<br>physics program management and calibration                                                      | COL Tom Cashman, M.D.                | Honolulu, HI<br>USNRC License<br>#53-00458-04                                     | Jun 92 – Jun 96<br>(8000 hours)              | N/A                                       |  |
| duties for:<br>Any byproduct material with atomic no.'s<br>1 – 83 for use as radiopharmaœuticals in<br>diagnosis and therapy.<br>J.L Shepard Cs-137 sealed 2200 Ci<br>irradiation source.                                                          |                                      |                                                                                   |                                              |                                           |  |
| Various calibration sources.                                                                                                                                                                                                                       |                                      |                                                                                   |                                              | N/A                                       |  |
| Doctoral Candidate, University of Texas Health<br>Science Center.<br>Various research and calibration sources.                                                                                                                                     | Dr. Dave Kopp, Ph.D.                 |                                                                                   | Aug 96 – Aug 99<br>(100 hours)               |                                           |  |
| Nuclear Scientist, U.S. Army Nuclear and<br>Chemical Agency.<br>Scientific editor and contributing author to a<br>North Atlantic Treaty Organization shied                                                                                         | Dr. Chuck Davidson, Ph.D.            |                                                                                   | Aug 99 – Aug 02<br>(500 hours)               | N/A                                       |  |
| engineering publication on sampling and identification of radiological agents.                                                                                                                                                                     |                                      |                                                                                   |                                              |                                           |  |

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|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | (All                                                                                 | NRC Form 313A fe                                                  | TC John Mercie                                                                                                                                                                 | r, Ph.D., May 2004                                            |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|-------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|--|
| Radiation Safety Officer (Broad Scope), Walter<br>Reed Army Medical Center. Manages one of the<br>largest health physics programs in both breadth<br>and depth in the United States. Program<br>oversight for medical diagnostic and therapeutic<br>uses; Cs-137 and Co-60 irradiators; equipment<br>calibration; human and animal research;<br>pharmaceutical research and development; and<br>related biomedical applications. Other<br>institutions operating under the WRAMC NRC<br>licenses include the Walter Reed Army Institute<br>of Research, the Naval Medical Research<br>Command and the Armed Forces Institute of<br>Pathology. | COL Dallas Hack, M.D.                                                                | Washington D.C.<br>USNRC Licenses<br>#08-01738-02<br>#08-01738-03 | Sep 02 – present<br>(3000 hours)                                                                                                                                               | N/A                                                           |  |
| n an                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 6. FORMAL TRA                                                                        | INING                                                             | na na hana na h                                                                | n na na hina na na hina na n |  |
| Degree, Area of Study                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Name of Program and<br>Location with<br>Corresponding<br>Materials License<br>Number | Dates<br>EX4                                                      | Name of Organization that<br>Approved the Program (e.g.,<br>Accreditation Council for<br>Graduate Medical Education)<br>and the Applicable Regulation<br>(e.g., 10 CFR 35.294) |                                                               |  |
| B.E.S., Nuclear Engineering                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | University of Texas at Austin                                                        |                                                                   | ABET Accredited                                                                                                                                                                |                                                               |  |
| M.Eng., Nuclear Engineering                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Cornell University, NY                                                               |                                                                   | ABET Accredited                                                                                                                                                                |                                                               |  |
| Ph.D., Radiological Physics                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Univ. of Texas Health Science<br>Center                                              |                                                                   | CAMPEP Accredite                                                                                                                                                               | ed                                                            |  |

# The American Board of Badinloy Organized through the cooperation of the "American College of Radiology, the American Roentgen Ray Society, the American Radium Society, the Radiological Society of North America, the Section on Radiology of the American Medical Association, the American Society for Therapeutic Radiology and Onocology, the Association of University Radiologists, and American Association of Physicists in Medicine Hereby certifies that John Rene Mercier, M.E. Has pursued an accepted course of graduate study und clinical work, has met certain standards and qualifications and has passed the examinations conducted under the authority of The American Board of Radiology

On this seventh day of June, 1995 Thereby demonstrating to the satisfaction of the Board that he is qualified to practice the specialty of

Diagnostic Radiological and Medical Nuclear Physics

Dougla Maynard no Welles Jenselle MD My Val Capp.



LIEUTENANT COLONEL JOHN R. MERCIER, Ph.D., PE, DABR, SRO Leader, U.S. Army Radiological Advisory Medical Team Chief, Health Physics, Walter Reed Army Medical Center Radiation Safety Officer, Walter Reed Army Medical Center Radiation Safety Officer, North Atlantic Regional Medical Command Chair, DoD Weapons of Mass Destruction Human Response Panel Senior NATO Umpire, Operational and Forensic Sampling of Radiological Agents

> Walter Reed Army Medical Center 6900 Georgia Ave., NW Bldg 41, Room 38 Washington, D.C. 20307-5001 wk: (202) 356-0058 john.mercier@us.army.mil

## FORMAL EDUCATION

Doctor of Philosophy (Radiological Physics), The University of Texas Health Science Center, San Antonio, Texas

Master of Engineering (Nuclear), Cornell University, Ithaca, New York, Bachelor of Engineering Science (Nuclear), The University of Texas, Austin, 1 exas

## PROFESSIONAL CREDENTIALS

Diplomate, American Board of Radiology, Dual Certified in Diagnostic Radiological Physics and Medical Nuclear Physics, DABR Physicist # P1779, 1995

Licensed Medical Physicist, Texas, # MP0402, 1995

Licensed Professional Nuclear Engineer, Texas PE Registration # 80363, 1995

Licensed Nuclear Plant Senior Reactor Operator, TRIGA Reactor, NRC License #SOP-10973, 1990

Certified Hazard Control Manager, International Board of Hazard Control Management, Master Certification # 2490, 1993

"A" Proficiency Designator – Professional credential awarded to recognized experts by the Surgeon General of the United States Army, 2003

#### AFFILIATIONS AND PROFESSIONAL MEMBERSHIPS

Member, Sigma Xi – The Scientific Research Society

Member, Tau Beta Pi – The National Engineering Honor Society

Member, American Nuclear Society

Member, Health Physics Society

Past President for Hawaii Chapter

Member, American Association of Physicists in Medicine

North Atlantic Treaty Organization (NATO):

Senior NATO Umpire, Land Group 7 Expert Subgroup on Sampling and Identification of Biological, Chemical and Radiological Agents

Past Head of U.S. Delegation, Expert Subgroup on Sampling and Identification of Radiological Agents

Past Member, Land Group 7 on Joint Nuclear, Biological and Chemical (NBC) Defense

Past Member, Land Group 7, Expert Working Group on Low-Level Radiation

Past Member, Operational NBC Working Group

Past Member, Medical NBC Working Party

Past Member, Task Group on Radiation Treatments and Countermeasures

The Technical Cooperation Program (TTCP) of the American, British, Canadian, and Australian (ABCA) Alliance:

Member, Technical Panel 13 on Radiation Hazards

Department of Defense:

Leader, U.S. Army Radiological Advisory Medical Team

Chair, DoD Weapons of Mass Destruction Human Response Panel

Lead Scientist, Special Weapons Operational Reconnaissance Detachment

Past Member, Nuclear Warfare Casualty Panel of Experts, Joint Readiness Clinical Advisory Board

Standing Member, DoD RADIAC Working Group

Member, Joint DoD/DOE Nuclear Weapon Accident Response Steering Group (NWARSG) and the NWARSG Technical Working Group

## PUBLICATIONS

Mercier, J. R., Mission and Capabilities of the U.S. Army Radiological Assistance Medical Team, Proceedings of the 11<sup>th</sup> International Radiation Protection Association (IRPA), Madrid, Spain, May, 2004 (in print).

Haslip, D. S., and Mercier, J. R., A NATO Exercise on Radiological Sampling, submitted to Health Physics in March, 2004.

Groeber, E., and Mercier, J. R., Development of Low-Cost Aerial Survey and Spectroscopy Systems, Proceedings of the 37<sup>th</sup> Health Physics Society Midyear Topical Meeting: Radiological Air Monitoring and Dosimetry, Augusta, GA, February 8-11, 2004, p. 220-230.

Mercier, J. R. (Ed.), Senior Umpire Report: 2003 NATO Field Trials for Sampling and Identification of Radiological Agents (SIRA), North Atlantic Treaty Organization (NATO) Document Number PfP(NAAG-LG/7-SIBCRA)D(2003)2, December, 2003.

Anno, G., R. Bloom, J. R. Mercier, R. W. Young, Dose Response Relationships for Acute Ionizing Radiation Lethality, Health Physics, 84(5), 2003, p. 565-575.

Mercier, J. R., and Moss, S. C., *The U.S. Army Radiological Advisory Medical Team*, Proceedings of the 36<sup>th</sup> Health Physics Society Midyear Topical Meeting: Radiation Safety Aspects of Homeland Security and Emergency Response, San Antonio, TX, January 26-29, 2003, p. 158-163.

Lankipalli, B. R., W. D. McDavid, S. B. Dove, E. Wieckowska, R. G. Waggener, and J. R. Mercier, Comparison of Five Methods for the Derivation of Spectra for a Constant Potential Dental X-Ray Unit, Dentomaxillofacial Radiology, 30, 2001, p. 264-269.

Mercier, J. R., Commander's Guide on Low-Level Radiation (LLR) Exposure in Military Operations, Edition 2, Standardization Agreement 2473, North Atlantic Treaty Organization, 2002.

Mercier, J. R., Commander's Guide on Nuclear Radiation Exposure of Groups During War, Edition 6, NATO Standardization Agreement 2083, North Atlantic Treaty Organization, 2001.

Mercier, J. R., D. T. Kopp, W. D. McDavid, S. B. Dove, J. L. Lancaster, and D. M. Tucker, Modification and Benchmarking of MCNP for Low-Energy Tungsten Spectra, Medical Physics, 27(12), 2000, p. 2680-2687.

Mercier, J. R., D. T. Kopp, W. D. McDavid, S. B. Dove, J. L. Lancaster, and D. M. Tucker, Measurement and Validation of Benchmark-Quality Thick-Target Tungsten X-Ray Spectra below 150 kVp, Radiation Research, 154, 2000, p. 564-581.

Mercier, J. R., D. T. Kopp, W. D. McDavid, S. B. Dove, J. L. Lancaster, and D. M. Tucker, Using Measured 30-150 kVp Polychromatic Tungsten X-Ray Spectra to Determine Ion Chamber Calibration Factors, Health Physics, 79(4), 2000, p. 402-406.

Mercier, J. R. (Ed.), NATO Handbook for Sampling and Identification of Radiological Agents, Volume 1 (Operational), Allied Engineering Publication 49, North Atlantic Treaty Organization, 2000.

Mercier, J. R., Medical Aspects of Nuclear Weapons and Radiation Effects, Chapter 3 of the FY 01/02 Army Specific Military Requirements for Nuclear and Radiation Effects Information, published by the U.S. Army Deputy Chief of Staff for Operations and Plans (DCSOPS), August 2000.

Mercier, J. R., Measurement and Monte Carlo Prediction of Diagnostic Tungsten X-Ray Spectra, Ph.D. Dissertation, Graduate School of Biomedical Sciences, The University of Texas Health Science Center, San Antonio, TX, 1999. Available from UMI Dissertation Services, Ann Arbor, MI, 1999, UMI No. 9938769.

Seibert, J. A. (Chair), T. Bogucki, T. Ciona, J. Dugan, W. Huda, A. Karellas, J. Mercier, E. Samai, J. Sheppard, B. Stewart, O. Suleiman, D. Tucker, R. Uzenoff, J. Weiser, and C. Willis, *Acceptance Testing and Quality Control of Photostimulable Storage Phosphor Imaging Systems, Report of Task Group #10*, American Association of Physicists in Medicine, 1998.

Willis, C. E., J. Mercier, M. Patel, *Modification of Conventional Quality Assurance Procedures to Accommodate Computed Radiography*, Proceedings of the 13<sup>th</sup> Conference of Computer Applications in Radiology, Society for Computer Applications in Radiology, Denver, CO, 1996.

Mercier, J. R., and Bramlitt, E. T., A Soil Cleanup on Johnston Atoll, Proceedings of the First Symposium on Soil Cleanup in the Pacific Islands, American Society of Civil Engineers, Honolulu, HI, 1993.

Moroney, J. D., Johnson, N. R., Moroney, K. S., Mercier, J. R., An Improved Method for Removing Transuranics from Coral Soil at Johnston Atoll, Proceedings of the 1992 Federal Environmental Restoration Conference, Hazardous Materials Control Resources Institute, Vienna, VA, 1992.

## ABSTRACTS AND POSTERS

Mercier, J. R., The U.S. Army Radiological Advisory Medical Team, 6<sup>th</sup> Annual Force Health Protection Conference, Albuquerque, NM, August 11-17, 2003.

Liu, H. L., Y. Pu, T. Andrews, J. Mercier, P. T. Fox, and J.-H. Gao, Cerebral Blood Flow Measurement Using Adaptive Threshold for Singular Value Decomposition Technique on Dynamic Contrast Agent MR Perfusion Imaging, 7<sup>th</sup> Meeting of the International Society for Magnetic Resonance in Medicine, Philadelphia, PA, 1999.

Mercier, J. R., D. T. Kopp, D. M. Tucker, C. E. Willis and J. L. Lancaster, X-Ray Spectra Resolution Requirements for Characterization of Image Receptors, 84<sup>th</sup> Scientific Assembly and Annual Meeting of the Radiological Society of North America, Chicago, 11, 1998.

Mercier, J. and D. Kopp, Preliminary Evaluation of the Monte Carlo Code MCNP4b for Diagnostic X-Ray Spectra, 40<sup>th</sup> Annual Meeting of the American Association of Physicists in Medicine, Medical Physics, 1998, 25(7), p. A105.

Willis, C. E., J. R. Mercier, M. G. Patel, Unresolved Issues in Computed Radiography, 38<sup>th</sup> Annual Meeting of the American Association of Physicists in Medicine, Medical Physics, 1996, 23(6), p.1076.

## PROFESSIONAL AND LEADERSHIP EXPERIENCE

#### **Chief, Health Physics** 8/02 – present Walter Reed Army Medical Center, Washington, D.C.

Lead the U.S. Army Radiological Advisory Medical Team (RAMT) in rapid response missions to save lives anywhere in the world. Chair the DoD Weapons of Mass Destruction Human Response Panel which is responsible for defining casualty criteria and developing casualty prediction models. Serve as executive agent and Radiation Safety Officer for broad-scope USNRC radioactive material and irradiator licenses (#'s 08-01738-02 and 08-01738-02). Direct comprehensive health physics services for world-renowned medical and research centers to include Walter Reed Army Institute of Research, the Armed Forces Institute of Pathology and Walter Reed Army Medical Center. Serve as regional Radiation and Laser Safety Officer and provide oversight and mission support services to Army medical facilities within the 21-state North Atlantic Regional Medical Command's umbrella of responsibility. Identify and train military scientists, as well as, develop test plans, techniques and procedures for the DoD Special Weapons Operational Reconnaissance Detachment (SWORD) in support of Combatant Commanders. Manage ~\$500K annually and supervise 20 health physics professionals.

## Nuclear Scientist 8/99 – 8/02 U.S. Army Nuclear and Chemical Agency, Springfield, VA

Served as primary consulting subject matter expert (SME) to Army Staff and other DoD/NATO/U.S. Government agencies on the medical effects of nuclear weapons and radiation. Set policy on friendly troop safety risk criteria and enemy personnel casualty criteria for nuclear weapons effects. Developed casualty estimation models for nuclear, biological and chemical (NBC) weapons. Served on numerous DoD and NATO SME panels for NBC research, operational doctrine and equipment development. Developed Army R&D requirements for radiobiology, biomedical technology and NBC operations. Served as Alternate Army Reactor Officer for the Army Reactor Office that maintains oversight of WSMR and APG fast burst reactors. Served on the Nuclear Employment Augmentation Team in support of Combatant Commanders.

# Doctoral Student

The University of Texas Health Science Center, San Antonio, TX

Research focused on diagnostic imaging, the use of Monte Carlo codes to simulate x-ray beam formation and transport, measurement of x-ray spectra, computed radiography and other digital imaging systems. Teaching duties and course work broadly covered the medical radiological physics profession.

Chief, Health Physics 6/92 – 6/96 Tripler Army Medical Center, Honolulu, HI 96859-5000

Executive agent and Radiation Safety Officer for a broad-scope USNRC radioactive material license (#53-00458-04). Directed comprehensive health physics services for a major teaching and research hospital. Developed or approved nuclear medicine, diagnostic radiology and radiation therapy QC protocols. Performed gamma camera acceptance testing. Evaluated and approved all Pacific region radiological facility designs. Conducted health and medical physics audits. Routinely provided formal and informal radiation safety training and imaging science lectures to nuclear medicine and radiology technologists. Routinely counseled physicians, patients, and hospital staff on radiation effects. Occasionally lectured radiology residents in imaging physics.

Project Engineer, Johnston Atoll Plutonium Mining Project 5/91 - 6/92 Defense Nuclear Agency, Kirtland AFB, NM 87115-5000

Spearheaded the Defense Nuclear Agency's \$15 million Plutonium Mining Project. Led world's first successful remediation of plutonium contaminated soil. Designed several multichannel analyzer radioassay systems using sodium iodide and high-pure germanium spectroscopy detectors. Developed and enforced various radiation safety, bioassay, and respiratory protection programs.

Exle

**Graduate Student** Cornell University, Ithaca, NY

Research focused on characterizing radiation damage to electronic components using the Cornell gamma irradiation facility. Gained experience as a federally licensed nuclear plant senior reactor operator (License # SOP-10973) that required mastery of all research facilities and radiological monitoring equipment within the reactor building. Developed experimental research protocols for the TRIGA reactor and assisted in training a reactor operator. Course work broadly covered the nuclear engineering profession.

### Radiation Protection Officer 12/85 - 12/88 Darnall Army Community Hospital, Ft Hood, TX 76544-5063

Executive agent and Radiation Safety Officer for USNRC limited-scope radioactive material license (#42-19113-01). Hospital consultant for health physics, diagnostic radiology physics, & medical nuclear physics. Developed radiation protection, radiology QA/QC, & nuclear medicine QA/QC programs. Performed health & medical physics audits, calibrations, x-ray system & shielding surveys. Troubleshooted image quality problems. Trained all radiation workers.

## Nuclear Medical Science Officer 1/85 - 12/85 US Army Environmental Hygiene Agency, APG, MD 21010-5422

Consulted Army and DoD installations for adequate radiation protection, radiology QA/QC, and nuclear medicine QA/QC programs. Wrote safety and QC procedures and evaluated x-ray system performance. Conducted radiological shielding evaluations and health hazard assessments of equipment and facilities.

**Commander, Detachment 1, A Company** 12/82 – 12/84 249<sup>th</sup> Supply and Transport Battalion, 49<sup>th</sup> Armored Division, Texas Army National Guard, Killeen, TX

Exercised command. Led with honor and respect.

Platoon Leader, HHQ Company 8/81 – 11/82 249<sup>th</sup> Supply and Transport Battalion, 49<sup>th</sup> Armored Division, Texas Army National Guard, Austin, TX

Developed leadership skills.

## RECENT PROFESSIONAL SHORT COURSES AND EXERCISES

Radiological Mass Casualty Medical Preparations Course, 17-20 Feb 2004 Course Director and Lead Instructor, Walter Reed Army Medical Center

Nuclear, Radiation and High-Yield Explosives (NRE) Course, 10 Feb – 4 May 2004 Invited Lecturer, Uniformed Services University of the Health Sciences

North Atlantic Treaty Organization (NATO) Sampling and Identification of Radiological Agents (SIRA) Field Trials, 21-26 Sep 2003 Senior NATO Umpire, NATO Land Group 7 (Joint NBC Defense)

Radiological Accident Command, Control, and Coordination Course, 18-21 Aug 2003 Student, Defense Nuclear Weapons School

Hazard Prediction Assessment Capability (HPAC) Software Basic Course, 15-18 Jul 2003 Student, Defense Threat Reduction Agency

Medical Effects of Ionizing Radiation Course, 6-7 May 2003 Student, Uniformed Services University of the Health Sciences

Center for Disease Control (CDC) Radiological Event Tabletop Exercise – Louisville, KY, 11 Feb 03 Leader, U.S. Army Radiological Advisory Medical Team, DoD

Train the Trainer: Transportation Emergency Preparedness Program, 25 Jan 2003 Student, Department of Energy -- National Nuclear Security Administration

Operation Diligent Warrior Nuclear Weapon Accident Exercise, 7-25 Oct 2002 Leader, U.S. Army Radiological Advisory Medical Team, DoD

NATO Staff Officer's NBC Defense Policy Course, 9-13 Jul 2001 Lecturer and Student, The NATO School – Supreme Headquarters Allied Powers Europe

Joint Nuclear Operations and Targeting Course, 12-16 Jun 2000 Student, Defense Nuclear Weapons School