

DEPARTMENT OF VETERANS AFFAIRS Veterans Health Administration National Health Physics Program 2200 Fort Roots Drive North Little Rock, AR 72114

OCT 2 2 2007

In Reply Refer To: 598/115HP/NLR

Cassandra F. Frazier
Division of Nuclear Material Safety
Nuclear Regulatory Commission (NRC), Region III
2443 Warrenville Road, Suite 210
Lisle, Illinois 60532-4352

Dear Ms. Frazier:

In reference to NRC License 03-23853-01VA, we are enclosing closeout survey documentation related to Building 72 at the VA Medical Center, Hampton, Virginia, for your review. Principal activities under the license have ceased in this building; therefore, we are requesting that Building 72 be released for unrestricted use.

As supporting information for review and approval of this request, we enclose the following documents:

Enclosure 1	Historical Site Assessment and Final Status Survey Report for the Veterans Administration Facility, Building 72, in Hampton Virginia
Enclosure 2	Additional Information Provided by the Permittee to the National Health Physics Program (NHPP)
Enclosure 3	Annotated Versions of Attachments 5.0 and 7.0 of Enclosure 1 to This Letter
Enclosure 4	Additional Comments on Enclosure 1 by NHPP Reviewer with Permittee Responses
Enclosure 5	Additional Facility Details

We believe these documents provide information consistent with 10 CFR 30.36 criteria to evaluate this separate building for a decommissioning action, and we conclude that the survey results and assessment comply with the radiological dose criteria in 10 CFR 20.1402 for an unrestricted release.

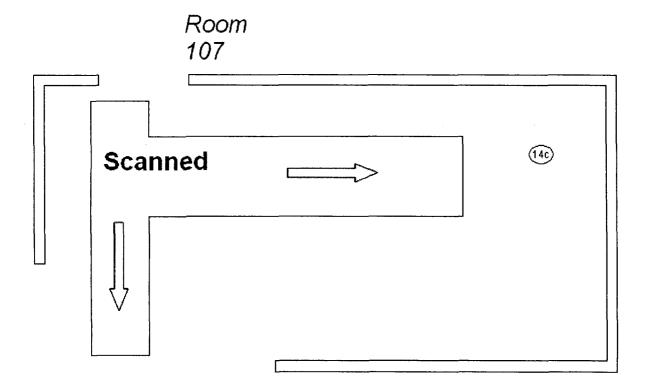
If you have any questions or comments, please contact Thomas E. Huston, Ph.D., VHA National Health Physics Program, at (501) 257-1578.

Sincerely,

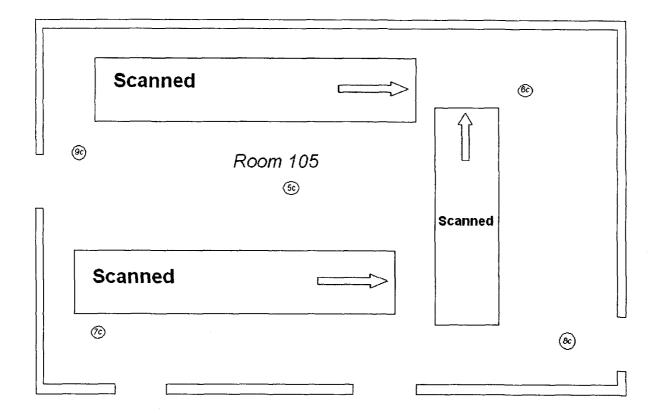
Director, National Health Physics Program

Enclosures

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					Survey Requireme	nts		
Area Classification:	3				Beta	Gamı	na	
Building/Area:	Room 108			Floor	20%			
Floor/Elevation:	Floor			Wall				
Survey Unit/Grid:	Bathroon	n/shower		Ceiling				
Surface:		nic tile	Actual	surveyed	30			
Survey Type:	β scan 771	cm² probe						
Date/Time:	2/23/2007							
					Instrume	nt Informa	tion	
Floor Monitor I	ID Number				MARSS Inst ID:			
Alpha/Beta S		2.5 inches/s	ec		Logger Model:	2350-1		
Alpha/Beta So	•			Lo	gger Serial Number:	149408		
•	can Speed:				Cal Due Date:	10/22/2007		
	can Height:				Detector Model:	43-37-1		
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Background Infor	mation			200				
Background intol	mation							
	Bkgd	Invest.	Alarm		Carres Cha	-1		
Material	Level	Level	Level		Source Che	CKS		
ceramic tile β floor	1.24k cpm	2.48k cpm				Date	Time	Initials
					Prior:	2/23/2007	925	bwb
					End:	2/23/2007	1635	bwb
				Note: Sou	rce checks required at t	peginning and	end of shif	t
Comments:								
Highest sca	an level seer	n in this room	n was 1.41k	cpm				
Smears tak	ken - see m	ap for location	on					
12C on sin	k and 13C o	n floor of sho	ower - No po	sitive activ	ity detected			
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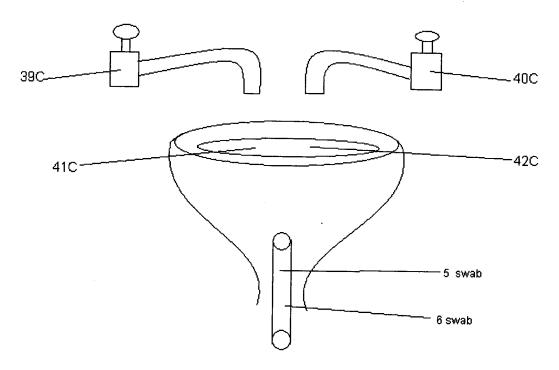


A Ol ifi					Survey Requireme			
Area Classification:	3				Beta	Gamn	na	
Building/Area:	Room 107			Floor	20%			
Floor/Elevation:				Wall				
Survey Unit/Grid:				Ceiling				
Surface:	ceram	ic tile	Actual	surveyed	35%			·
Survey Type: β	scan 771 c	cm² probe						
Date/Time:	2/23/2007			•				
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Floor Monitor ID	-				MARSS Inst ID:			
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Background Inform	<u>nation</u>							
Material	Bkgd Level	invest. Level	Alarm Level		Source Che	cks		
ceramic tile β floor	1.24k cpm	2.48k cpm				Date	Time	Initials
					Prior:	2/23/2007	925	bwb
	*				End:	2/23/2007	1635	bwb
				Note: Sou	rce checks required at b	eginning and	end of shift	:
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Techniciar	n/Surveyor:	Byron Bland Name	<u></u> t		Signature	Date: _	4/11/2007	
Supervisor	r/Reviewer:	Joseph W. M Name	Moon, CHP	<u> </u>	Signature Signature	Date: _	4/11/2007	

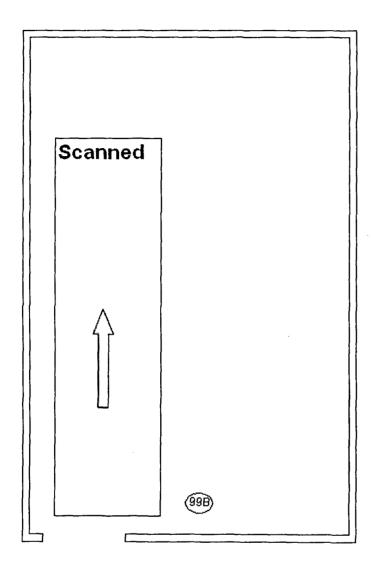


				Survey Requireme	nts		
Area Classification:	3			Beta	Gamm	а	
Building/Area:				Floor 20%			ŀ
Floor/Elevation:				Wall			
Survey Unit/Grid:	11001			Ceiling			
-	8 inch tile		Actual	surveyed 30%]
Survey Type:		cm² probe					ļ
Date/Time:	2/23/2007			-			
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Floor Monitor I	D Number			MARSS Inst ID:			
Alpha/Beta S		2.5 inches/s	ec	Logger Model:	2350-1		ł
Alpha/Beta So				Logger Serial Number:	149408		
	can Speed:	172 11011			10/22/2007		
	can Height:			Detector Model:	43-37-1		
Camma	Juli 1101g			Detector Serial Number:	PR145081		
Background Infor	mation						
	Bkgd	Invest.	Alarm	Source Che	cke		
Material	Level	Level	Level	Source Che			
8 inch tile	618 cpm	1236 cpm			Date	Time	Initials
				1	2/23/2007	925	bwb bwb
				End:	2/23/2007	1635	DWD
	<u> </u>			Note: Source checks required at	hadinning and	and of shift	.
	<u> </u>			Note: Source checks required at	beginning and	Cria or orm	
Smears ta	an level see ken - see n h 9C on floor	nap for locat	ion	cpm - No positive activity detected			
No activity	/ found in exc			074) clean-up guidelines o this document			
				Lynn Chant			
Technic	ian/Surveyor				_ Date:	4/11/2007	-
		Name)	Signature			
Supervis	or/Reviewer	: Joseph W	. Moon, CH	p Joseph Wing	_ Date:	4/11/2007	-
		Name		Signature			

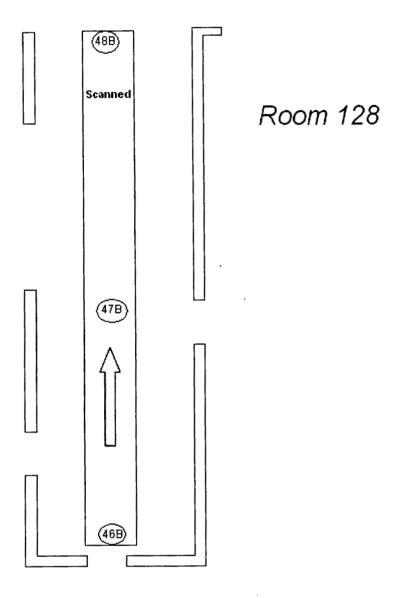
Sink in room 104

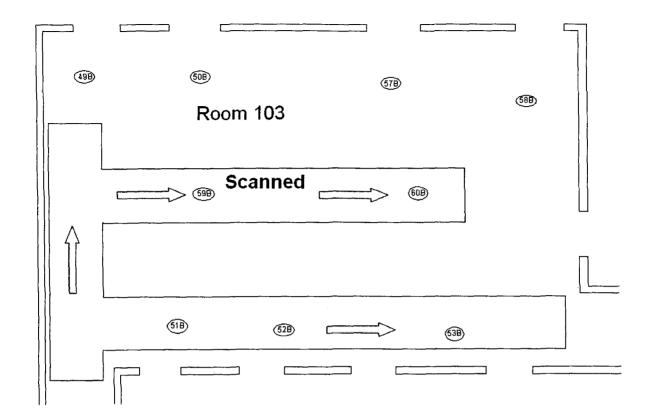


					Survey Requireme	ents				
Area Classification:	3				Beta	Gamn	na			
Building/Area:	Room 104			Floor	20%					
Floor/Elevation:	Floor			Wali						
Survey Unit/Grid:				Ceiling						
Surface:	ceram	ic tile	Actual	surveyed	25%					
Survey Type:	β scan 771 o	m² probe								
Date/Time:	2/23/2007									
						nt Informat	tion .			
Floor Monitor					MARSS Inst ID:					
Alpha/Beta S			ec		Logger Model:	2350-1				
Alpha/Beta S		1/2 inch		Lo	gger Serial Number:	149408		•		
I .	can Speed:				Cal Due Date:	10/22/2007				
Gamma S	can Height:				Detector Model:	43-37-1		•		
D - 1				Dete	ector Serial Number:	PR145081	,			
Background Infor	mation									
Material	Bkgd Level	Invest. Level	Alarm Level		Source Che	cks		:		
ceramic tile β floor	1.24k cpm	2.48k cpm				Date	Time	Initials		
					Prior:	2/23/2007	925	bwb		
					End:	2/23/2007	1635	bwb		
				Note: Sou	rce checks required at	beginning and	end of shi	ft		
Comments: Highest scan level seen in this room was 1.58k cpm Smears taken - see map for location 99B on floor - No positive activity detected Initial survey 30C in sink drain - positive activity detected at 226 dpm/100 cm² H-3 and 195 dpm/100 cm² C-14 Follow-up Investigational survey of sink (39C through 42C) - No positive activity detected 3-24-07 No activity found in excess of the RG 1.86 (1974) clean-up guidelines										
		Attach surv	ey map to t	his docun	nent					
Technicia	an/Surveyor:	Byron Bland Name	d		Signature	Date:	4/11/2007	-		
Supervis	or/Reviewer:	Joseph W. I Name	Moon, CHP	57-	Signature Signature	Date:	4/11/2007	-		

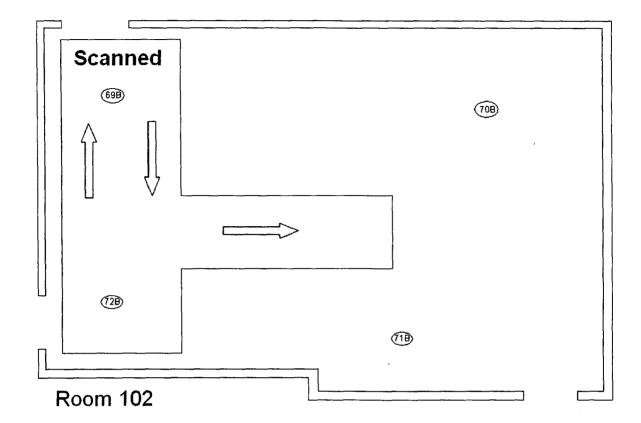


Room 104

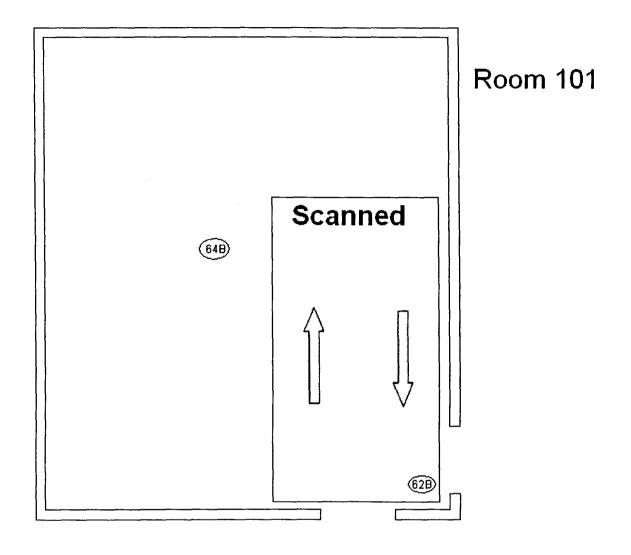




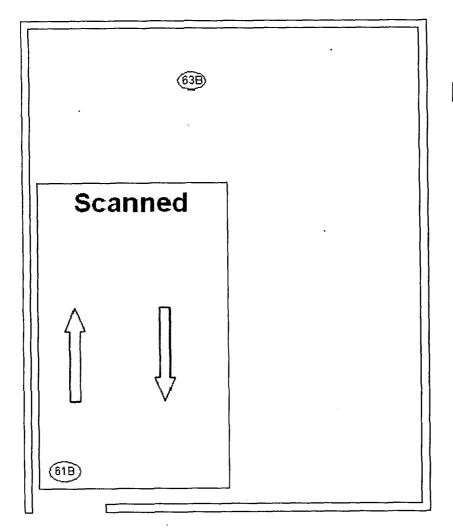
					Survey Requireme	nts		
Area Classification:	3				Beta	Gamn	na	
Building/Area:		& 103		Floor	20%			
Floor/Elevation:				Wall				
Survey Unit/Grid:				Ceiling				
Surface:	ceram	ic tile	Actual	surveyed	30%			
Survey Type:	β scan 771 c	m² probe		-				
Date/Time:								
					Instrume	nt Informat	tion	
Floor Monito	· ID Number:				MARSS Inst ID:			
	Scan Speed:	2.5 inches/se	ec		Logger Model:	2350-1		
· ·	Scan Height:			Lo	gger Serial Number:	149408		
	Scan Speed:				Cal Due Date:	10/22/2007		
1	Scan Height:				Detector Model:	43-37-1		
	, , , , , , , , , , , , , , , , , , ,			Det	ector Serial Number:	PR145081		
Background Infor	mation			20.		111110001		
Material	Bkgd Level	invest. Level	Alarm Level		Source Che	cks		
ceramic tile β floor	1.24k cpm	2.48k cpm				Date	Time	Initials
					Prior:	2/23/2007	925	bwb
						2/23/2007	1635	bwb
						2/20/2001	1000	5115
				Note: Sou	rce checks required at b	eginning and	end of shift	+
Smears tal 46B throug	an level seen i ken - see ma h 53B, 57B & is 59B & 60B ·	p for location 58B - No pos	sitive activity	detected		,		
No activity	found in exce	ss of the RG Attach surv	, ,					
Technic	ian/Surveyor:	Byron Bland Name	<u> </u>		Signature	Date: _	4/11/2007	
Supervis	sor/Reviewer:	Joseph W. N Name	loon, CHP	<u></u>	Signature Signature	Date: _	4/11/2007	
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				Survey Requireme	ante		
Area Classification:	3			Beta	Gamr	ma	
Building/Area:				Floor 20%	Jann	114	ı
Floor/Elevation:				Wall	<u> </u>		1
Survey Unit/Grid:	Utility	Room		Ceiling			
Survey Officeria.		concrete	Actual	surveyed 35%			
Survey Type:			Actual	Surveyed 55%			
Date/Time:		cm probe					J
Duto, Timos	2/20/2001			<u>Instrume</u>	nt Informa	<u>tion</u>	
Floor Monitor I	D Number:			MARSS Inst ID:			
Alpha/Beta So		2.5 inches/s	ec	Logger Model:	2350-1		-
Alpha/Beta Sc	-			Logger Serial Number:	149408		-
•	an Speed:			Cal Due Date:	10/22/2007		•
	an Height:			Detector Model:	43-37-1		-
	_			Detector Serial Number:	PR145081	,	-
Background Infor	<u>mation</u>						-
Material	Bkgd Level	invest. Level	Alarm Level	Source Che	cks		
sealed concrete	929 cpm	1.86k cpm			Date	Time	Initials
				Prior:	2/23/2007	925	bwb
				End:	2/23/2007	1635	bwb
				Note: Source checks required at I	beginning and	end of shi	ft
Smears tak 69B & 72B	en - see m on floor - No	n in this roor nap for locati o positive ac positive activ	on tivity detecte				
No activity	found in exc	ess of the R	G 1.86 (197	4) clean-up guidelines			
		Attach sur	vey map to	this document			
Technicia	n/Surveyor:	Byron Blan Name	<u>d</u>	Signature	Date:	4/11/2007	-
Superviso	r/Reviewer:	Joseph W. Name	Moon, CHP	Signature Signature	Date: _	4/11/2007	-



					Survey Requireme	ents		
Area Classification:	3				Beta	Gamr	na	
Building/Area:	Room 101		•	Floor	20%			
Floor/Elevation:	Floor			Wall				
Survey Unit/Grid:	Feed	Room		Ceiling				
Surface:	sealed	concrete	Actual	surveyed	30%			
Survey Type:	β scan 771	cm ² probe						
Date/Time:	2/23/2007			•				
					Instrume	nt Informat	<u>tion</u>	
Floor Monitor I	D Number:				MARSS Inst ID:			
Alpha/Beta Se	can Speed:	2.5 inches/se	c		Logger Model:	2350-1		
Alpha/Beta Sc	an Height:	1/2 inch		Lo	gger Serial Number:	149408		
Gamma So	can Speed:				Cal Due Date:	10/22/2007		
Gamma So	an Height:				Detector Model:	43-37-1		
				Dete	ector Serial Number:	PR145081		
Background Infor	<u>mation</u>							
 Material	Bkgd Level	Invest. Level	Alarm Level		Source Che	cks		
sealed concrete	929 cpm	1.86k cpm				Date	Time	Initials
					Prior:	2/23/2007	925	bwb
					End:	2/23/2007	1635	bwb
				Note: Sou	rce checks required at t	peginning and	end of shif	t
Smears tal	ken - see m	n in this room nap for locatio n floor drain -	n		rected			
	found in exc	ess of the RO	G 1.86 (1974) clean-up	guidelines			
		Attach surve	ey map to t	his docum	ent			
				-	Paymen Old and		41441555	
Technicia	in/Surveyor:	Byron Bland				Date:	4/11/2007	
		Name			Signature			
Superviso	or/Reviewer:	Joseph W. M	loon, CHP		eph Wing	Date:	4/11/2007	
		Name			Signature	·	<u></u> _	



Room 100

ì					Survey Requireme			
Area Classification:	3			[Beta	Gamr	na	
Building/Area:				Floor	20%			
Floor/Elevation:				Wall				
Survey Unit/Grid:		ve Room		Ceiling	000/			
Surface:		concrete	Actua	surveyed	30%			
Survey Type:		cm ² probe		l				l
Date/Time:	2/23/2007							
					Instrume	nt Informa	<u>tion</u>	
Floor Monitor I	D Number:				MARSS Inst ID:			
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Alpha/Beta So				Loc	ger Serial Number:	149408		•
<u>-</u>	an Speed:				•	10/22/2007		•
	an Height:				Detector Model:	43-37-1		•
	an morgina			Dete	ctor Serial Number:			•
Background Infor	mation							•
Material	Bkgd Level	Invest. Level	Alarm Level		Source Che	cks		
sealed concrete	929 cpm	1.86k cpm				Date	Time	Initials
				i	Prior:	2/23/2007	925	bwb
				!	End:	2/23/2007	1635	bwb
<u> </u>								
				Note: Sou	rce checks required at	beginning and	d end of sh	ift
Smears tal	ken - see m	n in this room ap for locatio n floor drain -	n .		ected			
No activity	found in exc	ess of the RG	·					
		Attacii surve	ey map to t			· · · · · · · · · · · · · · · · · · ·		
Technicia	n/Surveyor:	Byron Bland		···	Pagna Chant	Date: _	4/11/2007	_
		Name			Signature			
Superviso	or/Reviewer:	Joseph W. M	loon, CHP	يع خوال ي	epof W Moon	Date:	4/11/2007	<u>-</u>
		Name			Signature			

Attachment 1 Individual Survey Area Results and Maps

Historical Site Assessment and Final Status Survey Report for the Veterans Administration Facility Building 72 in Hampton, Virginia

1.0 Historical Site Assessment

The Hampton, Virginia Veterans Administration is the fourth oldest facility in the VA health care system, established just after the Civil War (in 1870) as a National Home for Volunteer Soldiers and Sailors. Building 72 was added to the facility in 1908 and was originally used as Dining Room for soldiers.

The first recorded use of radioactive materials at the Hampton, Virginia facility in 1961 was conducted under the authority of the Atomic Energy Commission (AEC). Under the Atomic Energy Act of 1954, the AEC had responsibility for the development and production of nuclear weapons and for both the development and the safety regulation of the civilian uses of nuclear materials. The Energy Reorganization Act of 1974 split these functions, assigning to one agency, now the Department of Energy, the responsibility for the development and production of nuclear weapons, promotion of nuclear power, and other energy-related work, and established the Nuclear Regulatory Commission for regulation of the civilian uses of nuclear materials. Over the next few years, the NRC developed its system of licensing and assumed regulatory authority over the research activities conducted by the Veterans Administration (VA). Materials Permits at the various VA facilities were organized under a single Broad Scope NRC License which is now administered from the North Little Rock, Arkansas VA facility.

The use of radioactive materials at the Hampton, Virginia facility has since been conducted under the authority of Materials Permit # 45-07569-01 now in its 82nd amended form.

1.1 Building Description

Building 72 was converted into a research building in 1974. The East end of the building is a single floor brick enclosure with an extensive wooden frame attic space capped with a slate roof and underlain by a dirt floor crawl space about three feet in height. This section of the building (presumably the former main dining hall) consists of laboratory facilities, administrative office spaces and a library. Fume hoods in the laboratory spaces are operated under a negative pressure gradient and generally are found to be filtered prior to entering the attic space. The fume hoods are exhausted through independent ventilation ducts/fan housings to the exterior of the roofing material. Sinks in the laboratories in this section of the building are drained to the crawl space area with piping typical of laboratory settings where corrosive materials are utilized and are often composed of lead. A system of floor drains was also installed in the laboratory spaces which drain to the crawl space area. There does not appear to be any type of hold-up tank system for the general neutralization of laboratory liquid wastes or the monitoring of hazardous liquid discharge. The liquid effluents of the building discharge to the sanitary sewerage system. The flooring is generally composed of a wood overlain by linoleum tiling in the halls and laboratory spaces and medium duty wall to wall carpeting in office and library spaces.

The West end of Building 72 (presumably the former kitchen and clean-up areas) is also a single floor brick enclosure but with a less expansive attic space. Several areas of the west end of the building appear to be additions of considerable age. This end of the building is underlain

by a cellar space of approximately five feet in height that houses the major utility equipment. This cellar space has recently been remediated for asbestos insulation on the piping and a low density concrete floor was poured over the original cellar floor surface. Access to the crawl space under the east end of the building (an opening of approximately 2.5 x 3 feet) is located here on the east wall of the cellar under the west end of the building. The flooring of the west end of the building is a mixture of ceramic tile, linoleum tiles, and a plastiform and/or linoleum sheeting applied over concrete or wooden substrate. The rooms in the west end of the building appear to have been designed to house animal studies, and consist of a series of wards and laboratories and support rooms containing incubators and sterilization chambers as well as bathroom facilities. The central area of the west end of the building appears to be composed of a series of isolation chambers/rooms connected to a common hallway with an adjacent decontamination room containing a large walk-in washdown chamber and laboratory complex.

An elevated enclosed wooden platform along the south side of the east end of Building 72 accessed by the main central hallway appears to have been the radioactive waste storage and processing area for the building. The far western end of this platform was isolated from the remainder of the platform and was apparently the location of a fire in the building. From the exterior, burned areas of the wooden siding surrounding a ventilation fan housing were observed and the view through a small window though obscured indicated that the space contained rubble scattered upon the floor. This space had no apparent access and was not able to be entered. A similar elevated enclosed wooden platform on the northern side of the east end of Building 72 connects to an adjacent larger building of unknown usage to the north.

A current floor plan of Building 72 was obtained from the Engineering Department of the Hampton, Virginia VA facility and a request was made for any existing maintenance or filter media change out frequencies or historical information concerning the fume hoods in Building 72.

1.2 Findings: Historical Usage of Radioactive Materials in Building 72

It is presumed that radioactive materials were not introduced to Building 72 until after the conversion of the building to a research facility in 1974. [Specific information on the applications for amendment to Materials Permit # 45-07569-01 which may help refine this information has been requested from the broad License administrator and is forthcoming.]

An interview with the current Radiation Safety Officer, Dr. Tapan K. Chaudhuri, was conducted on February 22, 2007. Dr. Chaudhuri provided a copy of the current Material Permit (Amendment 82) as well as copies of a series of *Health Physicist Assessments* spanning the time frame between 1998 and 2001 for review as documentation of the activities in Building 72 involving the use of radioactive material. These reports appear to be quarterly summaries of the activities of researchers in Building 72 by the Health and Safety staff of the Hampton VA facility. The reports were submitted to the facility Radiation Safety Officer for review. Each report would detail the active authorized users, the status of the building radioactive source inventory (including any additions or disposals) and whether any iodinations had been performed during the quarter by the researchers. Dr. Chaudhuri also provided a comprehensive list of authorized users of radioactive materials in Building 72 and the radionuclides which they were authorized to utilize in their studies and which radionuclides were actually used by these individuals. This list is reproduced below:

Researchers:

Richard Atkinson, M.D. – 12/1/86-11/27/93 – used H-3 Paul Aravich, Ph.D. – 7/1/87 -4/8/90- used I-125 Thomas Lauterio, Ph.D. – 4/8/90 – 1/8/94. used I-131, H-3. Jerome Seyer Ph.D., 7/21/96 – 10/30/04, used H-3, S-35, P-32. Steven Gentry, M.D. – 1991-1995, used H-3.

This list was compared to the current Materials Permit, the information contained in the quarterly assessment reports reviewed and a physical inspection of Building 72 with the following items being noted:

- The current Materials Permit lists these specific radionuclides under section 6 E through J as "storage only pending disposal and decommissioning", but also lists item 6 F as carbon-14 which is not cited on the list above as a radionuclide used in Building 72. Dr. Chaudhuri was asked about the usage of C-14 in Building 72 when a note in the Health Physics Assessment for the first quarter of 2001 mentioned a pick-up by a disposal company of 5 barrels of radioactive trash labeled as tritium (H-3) and Carbon-14. Dr. Chaudhuri reaffirmed that he had no knowledge of any historical usage of Carbon-14 by any of the researchers in Building 72.
- Laboratory and/or office spaces in the east end of Building 72 are labeled with some of these researchers names and radioactive material labels on fume hoods, drawers; and storage spaces within these laboratories are generally consistent with this usage. Some lead pig type casks in room 113D and the 2" lead bricks located in both rooms 113c and 113D are more commonly used to store/transport/shield high energy gamma emitting radionuclides but most likely were used to shield the often significant bremsstrahlung radiations coincident to common usage of phosphorus-32. One small container in room 113C was labeled as having contained manganese-54 but may have been transferred to Building 72 solely as a lead container after the Mn-54 was removed
- No overt evidence of historical usage of radioactive materials was found in the west end
 of Building 72 (beyond the double door access which separate the two sections of the
 building) in the form of radioactive material labels, shielding materials, equipment or
 laboratory notes within the rooms. This is consistent with anecdotal information
 concerning the building
- Although it is clear that monthly radioactive material inventory logs were kept for Building 72, these logs were not available for review nor were they located during visual inspections of any of the rooms. From the information contained in the summary quarterly *Health Physics Assessment* reports, the tracking of reduction of radioactive material inventory by decay in storage was not implemented over the period of usage.
- The types and quantities of loose radioactive material used in the building with the exception of tritium (H-3) were of relatively short half-life and mostly disposed of during a clean-up evolution in the first quarter of 2001, which was the last recorded documentation of usage and disposal in the building. The sealed sources that were present in the building (I-129, Cs-137 and Ni-63 rod or calibration/check sources) were either disposed of at that time or subsequently transferred to the inventory of the main hospital building and nuclear medicine laboratory (Eu-152 source).

- The last quarterly Health Physics Assessment report available for review (dated September 18, 2001) was still listing 180 μCi of H-3 and an undetermined, but minor, quantity of Sulfur-35, as well as noting the presence of a Cs-137 sealed check source in the building but exempt from inclusion on the formal inventory. The previous quarterly Health Physics Assessment report (dated July 12, 2001) noted that this material was scheduled to be disposed of in October of 2001.
- No waste disposal manifests were available for review but their existence is inferred from statements on the last quarterly Health Physics Assessment report (dated September 18, 2001). The last manifest noted was dated 2/12/01 (Manifest 01311) and listed three entries of H-3 waste in the amount of 37mBq each.
- The waste processing area on the elevated enclosed wooden platform on the south side of the East end of Building 72 was populated with various containers for the storage of red bag waste as well as an open 30 gallon drum half full of liquid (presumably mop water from rad labs) and some empty and unassembled cardboard boxes (with mold infestation) labeled for use as radioactive material. A container of absorbent material was also found.
- The sink in room 113D was taped over and noted to be "out of service-do not use" due to a broken drain line. The cabinet below the sink was open and contained approximately ½ inch of liquid covering the floor space of the cabinet. There was also evidence that the floor may have been coated with a water resistant barrier at some point (although it appeared well degraded). A bottle of "Isoclean" was also on the floor of this cabinet and presumably the liquid resident in the space.

1.3 Conclusions

Based on the identified past usage and documented inventory, the presence of remaining and residual radioactive material was expected to be minimal in Building 72. The activity, if present, should have been confined to the east end of the Building 72 and located primarily as tritium residue on laboratory surfaces. These surfaces include, but are not limited to, refrigerator and fume hood floors, fume hood filtration media, radioactive material storage drawer in room 113C, and the sink bowls and drains utilized for disposal of radioactive materials by discharge to the sanitary sewerage system (as noted in quarterly *Health Physics Assessment* reports). The possibility of contamination in the decontamination liquid residue found under the broken sink in room 113D and in the radioactive material labeled drum in the waste processing area was considered because of general nature and location.

On the basis of the radioactive materials authorized for use at the facility, carbon-14 and tritium were the only two radionuclides that were considered as potential contaminants. All other listed authorized radionuclides have short half-lives and will have decayed away to undetectable levels as of March of 2007.

In consideration of the nature of the materials observed in the laboratories of room 113 (lead container marked Mn-54) and two inch lead blocks spread about the lab, a cursory survey for the presence of gamma emitting radionuclides was also considered prudent.

2.0 Final Status Survey Design

2.1 Radiological Hazard Assessment and Survey Strategy

Based on the conclusions of the Historical Site Assessment, the Final Status Survey (FSS) of Building 72 focused on the detection of tritium (H-3) and carbon-14 (C-14) contamination on surfaces and floors of the specific laboratories, where radioactive materials were known to have been used. These areas, for the purpose of this survey were subjected to a rigorous evaluation with 100% of the accessible floor areas and horizontal surfaces being assessed for residual contamination. Other areas were evaluated under a graded approach, consistent with MARSSIM guidance. Accessible floor areas were surveyed with a 20% or greater coverage of total floor area and biased sampling was conducted targeting floor drains and sink drains.

Smear surveys for loose surface contamination were conducted in each room of the facility for the initial survey. The initial surveys represented wide area smears to determine the general presence of non-fixed surface contamination. Should any transferable surface contamination be detected, a second series of smear surveys were conducted as an investigatory process to determine the actual levels of transferable contamination in units appropriate to comparison with the clean-up standard.

2.2 Site Clean-up Criteria

For the release of this facility, the approach was no detectable levels of residual contamination using past acceptance criteria for unrestricted release as found in U.S. NRC Regulatory Guide 1.86 (See Attachment 2). The applicable criterion is set forth in Table 1 "Acceptable Surface Contamination Levels" of this Guide. Specifically, for the radionuclides of concern (C-14 and H-3), these criteria are those listed for beta-gamma emitters. The criterion is 5000 dpm/100cm² averaged over no more than 1 square meter with no area in excess of 15,000 dpm/100cm². In addition, no area may contain removable contamination in excess of 1000 dpm/100cm² as determined by dry smear count evaluated over no more than 100 cm².

2.3 Survey Instrumentation

Thin windowed portable gas flow proportional counters were selected for the floor and horizontal surface assessment. The proportional detectors are of two different sizes, a large area probe (771 cm²) used in conjunction with a scanning floor monitor unit which scans at a fixed rate of approximately 2.5 inches/second and a hand held probe of an area more appropriate to direct comparisons with the clean-up standard (126 cm²). If contamination is detected with the floor monitoring unit, the smaller probe will be used to evaluate the contamination levels for comparison with the clean-up criterion.

Specifically, the two proportional counters used are:

Ludlum Model 43-37-1 gas flow proportional detector (SN PR145081) 771 cm² thin window (8 mg/ cm² mylar) coupled with a Ludlum Model 2350-1 (SN 129408) data logger, and

Ludlum Model 43-68 gas flow proportional detector (SN PR148454) 126 cm² thin window (8 mg/cm² mylar) coupled with a Ludlum Model 2350-1 (SN 129408) data logger

This type of detector is particularly sensitive to pure beta emitting radionuclides such as C-14. These detectors were calibrated and efficiencies established for C-14 at around 18% (See Attachment 3). This type of detector is not particularly sensitive to H-3 due to the very low energy beta emission. Essentially, beta particles from H-3 cannot penetrate even the thin window of these detectors. Therefore, the monitoring for H-3 contamination was performed by smear survey evaluation. While it is possible for H-3 to be present as fixed contamination on surfaces, the mobile nature of this radionuclide makes it also most likely that a fraction will also be present as non-fixed and available for smear survey identification. A liquid scintillation counter was utilized for the evaluation of the smear sample media by a qualified independent vendor service.

The smears utilized for the survey were the special type which dissolves completely into the liquid scintillation cocktail so that light transmission is not impaired in the counting vials by the smear media. The smears were evaluated at three energy bands corresponding to the energies of the radionuclides of concern -- a low energy band for H-3, mid-energy for C-14/S-35, and an upper energy band for P-32 and other radionuclides, which would include common beta/gamma emitting radionuclides. In addition to liquid scintillation counting of smears, a general area survey for gamma emitting radionuclides was conducted using a 1" x 1" NaI(TI) detector.

2.4 Evaluations

Background levels and check source response were verified prior to the commencement of surface monitoring or surveying and periodically during the evaluation period as well as at the completion of daily activities to assure that the instruments were performing with the efficiency determined during calibration. Background measurements for the various types of media present were established so that appropriate background levels could be subtracted from the direct measurements.

If no C-14 contamination was detected by direct measurement survey or smear evaluations, no H-3 detected by smear evaluations, and no elevated gamma levels were detected; then these initial screening surveys were considered sufficient for final assessment. If investigations of areas were necessary due to detection of the presence of radioactive materials during the initial survey phase, then specific levels of contamination were evaluated by performance of additional surveys and smears.

3.0 Initial Radiological Survey

3.1 Conduct of the Initial Radiological Survey

The initial survey of Building 72 was conducted on February 22nd and February 23rd of 2007. Each room of the facility was evaluated with the floor monitor at the percentages established by the survey design. In addition, two hundred and thirty smear samples were obtained over the entire building with some being biased samples of every floor drain and sink drain in the facility. The locations of the smear samples were documented of a plat drawing of Building 72 obtained from the onsite Engineering group (See Attachment 4).

The smear samples were individually packaged to prevent cross-contamination if any were found to be present and were sent to Radiation Service Organization (RSO, Inc.) of Laurel

Maryland for evaluation on February 26, 2007. RSO, Inc evaluated the samples with a Packard Model 5300 Liquid Scintillation Counter (See Attachment 5).

3.2 Findings

Evidence of facility contamination was detected with the floor monitor in rooms 113 (two locations) and 113B (one location). These locations were further evaluated using the hand held proportional counter and these areas were found to have maximum contamination levels of 3500 cpm/126 cm² and 4500 cpm/126 cm² in Room 113 and a level of 6200 cpm/126 cm² in room 113B. Assuming that the contamination is primarily C-14, the levels in room 113 are above the NRC Regulatory Guide 1.86 criterion for beta-gamma emitting radionuclides at 12,500 dpm/100 cm² (3500 cpm/126 cm²) and 16,750 dpm/100 cm² (4500 cpm/126 cm²). The floor location in room 113B is also above the NRC Regulatory Guide 1.86 criterion at 24,250 dpm/100 cm².

Smears of these three contaminated floor areas were obtained and evaluated with the initial smear sets (smear samples 26C through 28C). None of these smears were in excess of the NRC Regulatory Guide 1.86 criterion for removable beta-gamma emitting radionuclides with the highest in the identified floor contamination areas being 17 dpm/100cm².

An additional area of surface contamination was found on the sink surface in room 113B directly between the two faucets at 8500 cpm/126 cm² (36,500 dpm/100cm². A smear of this area (smear sample 29C) returned a removable contamination level of 23 dpm/100cm².

The other smear samples taken in room 113B before the floor contamination was discovered (smear samples 10B sink drain and 12B floor drain) also showed indication of removable surface contamination at 230 dpm/100 cm² and 52 dpm/100 cm². Smear sample 21B taken near the exit door from the Room 113 complex indicated a removable contamination level of 15 dpm/100 cm².

Four other smear samples gave a positive indication of removable contamination. Smear sample 31B was taken beneath the sink in room 113D and indicated 11 dpm/100 cm². Smear sample 40B was taken as a large area smear on the inner surfaces of the refrigerator/freezer in Room 113C and indicated 124 dpm/100 cm² in the H-3 channel and 47 dpm/100 cm² in the C-14 channel. Smear sample 41B was taken on the floor in room 125 and indicated 64 dpm/100 cm² in the H-3 channel and 22 dpm/100 cm² in the C-14 channel. The final smear indicating removable contamination (30C) was taken in the sink drain in the women's bathroom (room 104) and indicated 226 dpm/100 cm² in the H-3 channel and 195 dpm/100 cm² in the C-14 channel.

3.3 Evaluation of Initial Survey Results

Based on the findings of the initial survey, seven distinct areas were targeted for follow-up investigational surveys. These areas are identified below:

- The sink bowl and drain in Room 104 (Women's Bathroom). This area was not anticipated to have been contaminated.
- Room 125 NW corner to verify presence of removable contamination. This area was not anticipated to have been contaminated.

- Room 113B removable contamination indications on floor drain and sink drain smears.
- Room 113 fixed floor contamination locations (obtain wax build-up scrapings to determine if contamination is removable).
- Room 113C a more comprehensive evaluation of refrigerator surfaces to possibly isolate the contamination location.
- Room 114 Fume Hood (very low indication but rad sticker on side of hood warrants further investigation.
- Room 113D under "out of order" sink

These areas were identified for detailed follow-up investigational surveys to better define the areas indicating positive contamination results to assist in defining any needed remediation activities. The direct measurement surveys of the remainder of the laboratory bench tops and other horizontal surfaces above floor level in Rooms 112 and 124 and the Room 113 laboratory complex were deferred until the follow-up survey tasking.

4.0 Follow-up Investigational Survey

4.1 Conduct of the Follow-up Survey

The radiological survey team returned on March 21st and March 22nd of 2007 to conduct follow-up investigational surveys on areas identified to be impacted by the findings of the initial surveys performed on February 22nd and 23rd of 2007. Additional surveys included smears for removable contamination with smears submitted to RSO, Inc for counting on March 26th 2007 and the results reported on March 27th, 2007 (See Attachment 6).

4.2 Investigational Survey Details

An additional 36 smear samples (31C through 67C) for surface areas and 3 swabs for drains were obtained in the targeted investigation areas. A general gamma activity survey was conducted with a Ludlum Model 19 μ R meter. All remaining above floor horizontal laboratory surfaces in the designated comprehensive survey areas were evaluated with the 126 cm² thin-window, gas flow proportional detector (Rooms 112 and 124 as well as the remaining above floor level horizontal surfaces in the Room 113 laboratory complex).

4.3 Findings

The following summarize the survey results:

- The sink in the women's bathroom was evaluated with four smears and 2 swabs (on surfaces inside the drain). No evidence of removable contamination was found on any of the survey media.
- The Northwest corner Room 125 was evaluated with five smear samples. No evidence
 of removable contamination was found on any of the survey media.
- The Fume hood in room 114 was investigated by taking two smear samples on each vertical surface (one high and one low) as well as direct measurements with the hand held proportional counter detector. Smears 31C through 38C returned no evidence of

removable contamination and the direct measurements were indistinguishable from the background count rate.

- No evidence of contaminated surfaces was found in rooms 124 or 112 during the addition direct measurements of the above floor horizontal surfaces.
- Three additional contaminated areas were identified on the above floor horizontal surfaces within the room 113 complex. In room 113A, a direct measurement of the speed concentrator lid was 7500 cpm/100cm² (33,000 dpm/100cm²). A smear sample of the concentrator lid (49C) returned a removable contamination level of 1147 dpm/100 cm² of H-3 and 1318 dpm/100 cm² of C-14. In room 113D, an additional hot spot was identified on the left front top of the bench top of the sink surface of 2900 cpm/100cm² (11,500 dpm/100cm²). A smear sample (67C) of this location returned no evidence of removable surface contamination.
- An additional hot spot was identified on top of the decontamination sink in room 113B with a direct measurement of 321,000 cpm/100 cm² (1,340,000 dpm/100cm²) a smear sample of this location returned removable contamination of 3998 dpm/100cm2 in the H-3 channel and 5389 dpm/100cm2 in the C-14 channel. Smears of the known two hot spots on the sink top surface and vertical surface of the sink confirm removable contamination in excess of the clean-up guidelines. The smear survey of the floor drain and swabs within the floor drain do not confirm the presence of removable contamination.
- The refrigerator/freezer in room 113C returned positive but low-level indications of removable surface contamination in two of the twelve smear samples obtained. The left bottom drawer returned H-3 activity of 30 dpm/100 cm² and C-14 activity of 14 dpm/100 cm². The floor of the freezer returned H-3 activity of 107 dpm/100 cm² and C-14 activity of 20 dpm/100 cm². The top shelf of the freezer door returned H-3 activity of 51 dpm/100 cm² and C-14 activity of 8 dpm/100 cm². The next to bottom shelf of the refrigerator door returned H-3 activity of 63 dpm/100 cm² and no apparent C-14 activity. None of the areas of the refrigerator freezer were contaminated above the Regulatory Guide 1.86 guideline of 1000 dpm/100 cm².

4.4 Delineation of Areas Confirmed to be Contaminated (Results)

All areas of Building 72 with the exception of the Room 113 complex were free of detectable contamination both fixed and removable. No beta emitters or gamma emitting radionuclides above background levels were identified.

Within the Room 113 complex, areas of the Room 113 floor marked as having fixed contamination were above the Regulatory Guide 1.86 guideline but the radioactive material appears to be fixed. In room 113D, the top of the sink contained an area of fixed contamination in excess of the guideline. In Room 113C, the refrigerator/freezer contained removable contamination below the guideline. In room 113A, the speed concentrator unit was contaminated above the guidelines for both removable and direct measurements of C-14.and H-3. In room 113B, a small area of floor was contaminated above the guideline and the top of the sink benchtop was contaminated above the guidelines.

4.5 Recommendations for Remediation

The following remediation actions were recommended and taken:

- Discard the Speed concentrator in Room 113A as radioactive waste.
- Remove portions of the sinktop in rooms 113B and 113D identified as contaminated and discard as radioactive waste.
- Decontaminate/remove as radioactive waste contaminated sections of the refrigerator/freezer in room 113C.
- Remove portions of the flooring identified to be contaminated and discard as radioactive material.

5.0 Remediation

Chesapeake Nuclear Services returned to the facility on June 28th, 2007, to remediate the areas recommended in Section 4.5 and to perform surveys to demonstrate that all surfaces identified as contaminated during the Follow-up survey of March 21st and 22nd, 2007, were either removed from the facility or otherwise met the facility clean-up criteria as described in Section 2.2. Arrangements were made with licensed radioactive waste broker RSO, Inc of Laurel, MD to package and remove the debris that resulted from the remediation effort. Post remediation surveys were conducted with a Ludlum Model 2360 attached to the 125 cm² thin window gas-flow proportional detector used for the follow-up surveys on March 21st and 22nd, 2007 to demonstrate that all facility surfaces remaining met the facility clean-up criteria. Swipe surveys were also conducted of surfaces that had undergone remediation or were suspected to possibly have been impacted by the remediation process.

- Speed Concentrator in Room 113A. Based on the results of the Follow-up survey, the benchtop surface in room 113A was not impacted by the presence of internal contamination within the speed concentrator. The speed concentrator was removed and discarded as radioactive waste.
- Sinktop and Floor surfaces in Room 113B: Major impacted portions of the sinktop were partitioned and carefully removed to prevent transfer of loose surface contamination to otherwise non-impacted surfaces. Following removal of the known contaminated sections of the sinktop, additional surveys were conducted to locate any additional areas that might require remediation. During these measurements, the faucet plumbing fixture on the right side of the sink was found to be contaminated but due to geometric considerations, it was difficult to determine at what levels. Decontamination of the fixture was attempted but was unsuccessful. A decision was made to remove the fixture and discard it as radioactive waste. A portion of the wooden framework beneath the sinktop was observed to be water stained and due to its location beneath the contaminated portion of the sinktop was surveyed for residual contamination. Although no contamination was measurable with the proportional detector, this section of wooden truss was removed and discarded as radioactive waste due to the high probability of contamination set into the wooden fibers. The areas of linoleum tile identified as contaminated in Room 113B were removed and discarded as radioactive waste.
- Refrigerator Internal Surfaces in Room 113C: Two decontamination passes were performed with Windex and Bounty paper towels on the internal surfaces of the refrigerator/freezer in Room 113C. The decontamination media was discarded as

radioactive waste. The contamination levels of this refrigerator were not detectable with the proportional counter during the Follow-up surveys but were only measurable by smear survey.

- Sinktop in Room 113D: The impacted section of the sinktop in Room 113D was removed and discarded as radioactive waste.
- Floor surfaces in Room 113: The two areas of linoleum tile identified as impacted during the Follow-up surveys of March 21st and 22nd, 2007 were removed and discarded as radioactive waste.

6.0 Final Status Survey

6.1 Conduct of the Final Status Survey

Following the completion of all remediation tasks and in-process surveys, the container of radioactive waste sealed and removed from the facility. A radioactive waste manifest was prepared and forwarded to the facility RSO for approval and certification statement signature. Final measurements and smear surveys were then conducted of the remediated floor surfaces, the internal surfaces of the refrigerator/freezer and the sink/benchtop or floor surfaces nearest those surfaces removed during the remediation.

6.2 Results of the Final Status Survey

No detectable contamination was measured above background with the 125 cm² proportional detector on any of the remediated floor surfaces in Rooms 113 or 113B. No detectable contamination was measured above background on the remaining sinktop surfaces in Room 113D. A small residual sinktop surface of approximately 400 cm² located in Room 113B at the top of the remaining wooden framework of the sink (right rear) was found to have residual contamination below the clean-up criteria at 3,600 dpm/100 cm2 and a total activity around 5 nCi (C-14). A smear of this area was obtained to assess the loose surface contamination status. No other surfaces were found to contain residual contamination by direct measurement. The results of the smears taken of the interior of the refrigerator in Room 113C and of the remaining residually contaminated surface in Room 113B as well as remediated floor surfaces and areas near the removed sinktop surface were all found to be free of loose surface contamination (Attachment 7.0).

6.3 Analysis of the Final Status Survey Results

The remediation of the identified contaminated areas/equipment was completed; all identified areas with elevated levels were remediated to below Regulatory Guide 1.86 clean-up criteria. RSO, Inc. of Laurel, MD, took possession the waste for disposal – 211 lbs, 4.1 cubic feet containing 0.9 mCi C-14 and 0.001 mCi H-3.

The facility clean-up criteria as established in Section 2.2 requires that all surfaces be less than 5000 dpm/100cm² averaged over no more than 1 square meter with no area in excess of

15,000 dpm/100cm². The remaining residually contaminated surface is significantly less than 1 square meter (0.04 square meters) and yet still meets the clean-up criteria for average fixed contamination. The remaining residually contaminated surface at 3600 dpm/100cm² is a small fraction (< 0.25) of the maximum residual contamination clean-up criteria for a 100 cm² sized area. NRC's default surface contamination level corresponding to 25 mrem/yr is 3.7E+06 dpm/100 cm² (NUREG-1757). So, leaving in-place does not pose an issue for the unconditional release of the site. Additionally, the piece is below the 10 CFR 30 exempt concentration value for C-14 of 8x10⁻³ uCi/ml and the exempt total activity level of 100 uCi.

The hypothetical dose to a member of the public from the unconditional release of the facility is much less than 1 mrem per year and well below the 25 mrem per year decommissioning criteria of 10 CFR 20.

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Historical Site Assessment and Final Status Survey Report for the Veterans Administration Facility Building 72 in Hampton, Virginia

Final Report

8/13/2007

Surveys Performed by:

Joseph W. Moon, CHP and Byron W. Bland



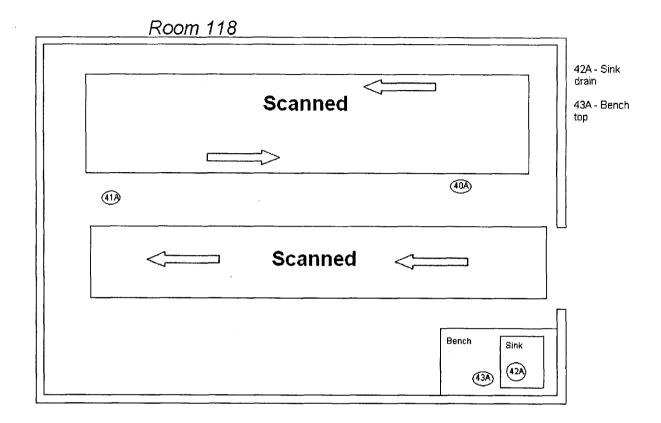
788 Sonne Drive Annapolis MD 21401 410.266.9174 voice 410.266.5811 fax www.chesnuc.com

Enclosure 1

Historical Site Assessment and Final Status Survey Report for the Veterans administration Facility Building 72 in Hampton Virginia

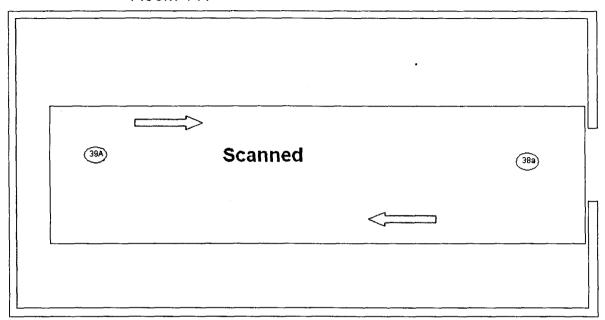
(Prepared: August 13, 2007)

1								
					Survey Requireme			
Area Classification:					Beta	Gamr	na	
Building/Area:	Room 119			Floor	20%			
Floor/Elevation:				Wall				
Survey Unit/Grid:	Copy Room			Ceiling				
Surface:	8 inch tile		Actual s	urveyed	30%			
Survey Type:	β scan 771 cr	m² probe						ļ
Date/Time:	2/22/2007							
					Instrume	nt Informa	<u>tion</u>	
Floor Monito	r ID Number:				MARSS Inst ID:			
ľ	Scan Speed:	2.5 inches/s	sec		Logger Model:	2350-1		
1	Scan Height:			Le	ogger Serial Number:	149408		•
•	Scan Speed:				Cal Due Date:			•
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Background infor	mation							
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Material	Bkgd Level	Level	Level		Source Che	cks		
8 inch tile β Floor	618 cpm	1236 cpm				Date	Time	Initials
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						2/22/2007	1655	bwb
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		Name			Signature			
Supervi	sor/Reviewer:	Joseph W.	Moon, CHP		epop W Many	Date:	4/11/2007	_
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1								
					Survey Requireme	ents		
Area Classification:	3				Beta	Gamr	na	
Building/Area:	Room 118			Floor	20%			
Floor/Elevation:	Floor			Wall				
Survey Unit/Grid:				Ceiling				
Surface:	8 inch tile		Actual s	urveyed	35%			
Survey Type:	β scan 771	cm ² probe						
Date/Time:	2/22/2007							
					Instrume	nt Informa	<u>tion</u>	
Floor Monitor I	D Number:				MARSS Inst ID:			
Alpha/Beta So		2.5 inches/s	sec	•	Logger Model:	2350-1		•
Alpha/Beta So	·=			- La	ngger Serial Number:	149408		•
•	an Speed:			•	Cal Due Date:	10/22/2007		•
Gamma So				•	Detector Model:	43-37-1	···	•
				Det	ector Serial Number:			•
Background Infor	mation							•
	Bkgd	Invest.	Alarm		Source Che	oke		
Material	Level	Level	Level		Source Che	CV2		
8 inch tile β Floor	618 cpm	1236 cpm				Date	Time	Initials
					Prior:	2/22/2007	1400	bwb
]	End:	2/22/2007	1655	bwb
				Note: Sou	irce checks required at t	peginning and	end of shift	ft
Comments:								
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No activity	found in exc	ess of the F	RG 1.86 (19)	74) clean-u	p guidelines			
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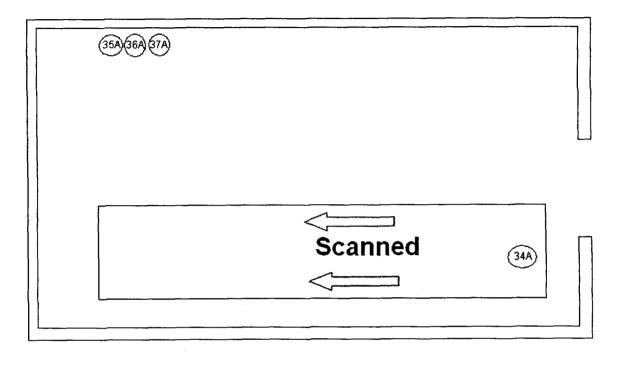
Room 117



					Survey Requireme	ents		
Area Classification:	3				Beta	Gamı	ma	
Building/Area:				Floor	20%			
Floor/Elevation:				Wall				
Survey Unit/Grid:				Ceiling				
Surface:	8 inch tile		Actual su	urveyed	40%			
Survey Type:		cm ² probe		•				
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Material	Bkgd Level	Invest. Level	Alarm Level		Source Che	cks		
8 inch tile β Floor	618 cpm	1236 cpm				Date	Time	Initials
					Prior:	2/22/2007	1400	bwb
					End:	2/22/2007	1655	bwb
				Note: So	urce checks required at l	beginning and	end of shif	t
Smears tak 38A and 39	en - see m A - No posit	ap for locat ive activity o		,	p guidelines			
		Attach sur	vey map to	this docu	ment			
Technicia	n/Surveyor:		ıd		Pynn Plant	Date:	4/11/2007	
		Name			Signature			
Superviso	r/Reviewer:		Moon, CHP		eph William	Date:	4/11/2007	<u>.</u>
		Name			Signature			

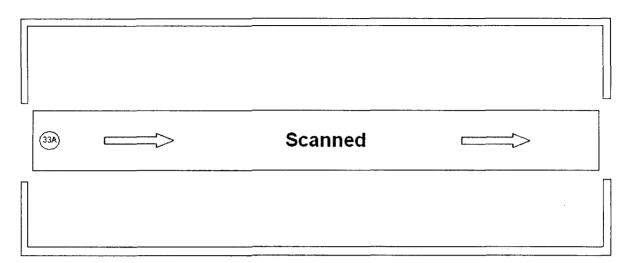
Room 116A

Fume Hood 35A - Floor 36A - Walls 37A - Exhoust

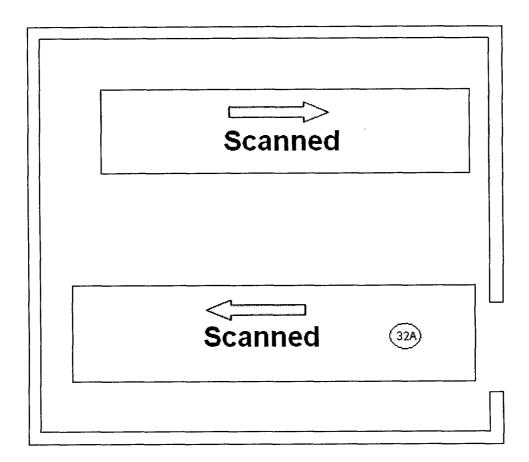


				Survey Requireme	ents			
Area Classification:	3				Beta	Gamı	na	
Building/Area:		and 116A		Floor	20%	Quille		
Floor/Elevation:				Wall	20,0			
Survey Unit/Grid:				Ceiling				
	8 inch tile		Actual s	urveyed	25%			
Survey Type:		cm ² probe		•				
Date/Time:								1
Floor Monitor I		Q.E. in all and			MARSS Inst ID:	nt Informa	tion_	
Alpha/Beta So			ec	. ,	Logger Model:	2350-1		
Alpha/Beta So		·	Logger Serial Numb			149408		
	can Speed:			-	Cal Due Date: Detector Model:	10/22/2007		
Gamma So	an Height:			Dat	Detector Model: ector Serial Number:	43-37-1 DD145091		
Background Infor	mation			Det	ector geriai Number:	FK145081		
Material	Bkgd Level	Invest. Level	Alarm Level		Source Che	cks		
8 inch tile β Floor	618 cpm	1236 cpm]		Date	Time	Initials
				1	Prior:	2/22/2007	1400	bwb
					End:	2/22/2007	1655	bwb
				Note: Sou	urce checks required at 1	beginning and	end of shif	t
Comments:	an level see	n in this sun	yev area we	ie 772 onm				
1	ken - see m		•	is the Chill				
i	- 33A - No p	•		l				
	A - 34A thro		-		ted			
	A Fume Hoo ation Symbo		•		ny ventilation system) od ved	or of VOC's in	room	
No activity	found in exc	ess of the R	G 1.86 (19	74) clean-u	p guidelines			
		Amarta		. 463	-			
		Attach sur	vey map to	nis aocu	ment			
Technicia	ın/Surveyor:	Byron Blan	d	<u></u>	Pyren Plant	Date:	4/11/2007	
		Name			Signature			
Superviso	or/Reviewer:	Joseph W.	Moon, CHF		epop a Man	Date:	4/11/2007	
		Name			Signature			

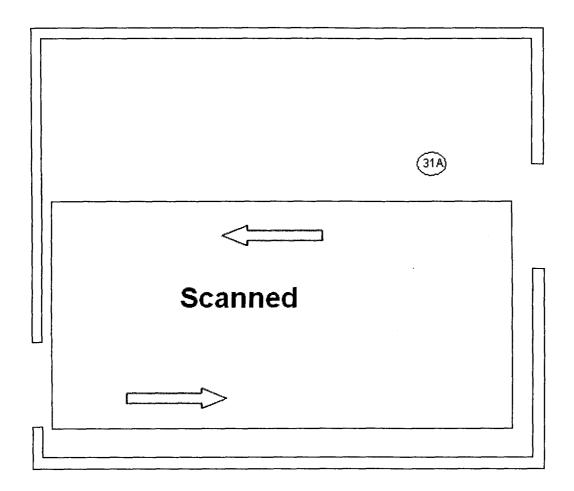
Room 116



Room 115A



Room 115

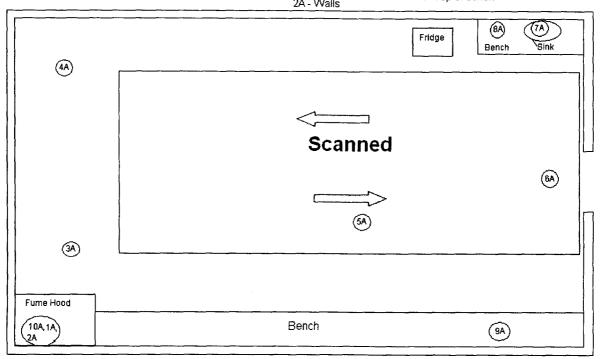


Area Classification: 3 Building/Area: Rooms 115 and 115A Floor/Elevation: Floor Survey Unit/Grid: 8 inch tile Survey Type: \$\scan 771 \cdot \cdot \cdot 2 \rangle		Actual su	Floor Wall Ceiling urveyed	Survey Requirements Beta 20% 45%	ents Gami	ma		
Floor Monitor I Alpha/Beta So Alpha/Beta So Gamma So Gamma So	D Number: can Speed: can Height: can Speed: can Height:	1/2 inch	sec		Instrume MARSS Inst ID: Logger Model: ogger Serial Number: Cal Due Date: Detector Model: sector Serial Number:	2350-1 149408 10/22/2007 43-37-1 PR145081	tion	
Background Infor	mation Bkgd Level	Invest. Level	Alarm Level		Source Che	cks		
8 inch tile β Floor	618 cpm	1236 cpm			Duit a.u.	Date	Time	Initials
						2/22/2007 2/22/2007	1400 1655	bwb bwb
Smears tal Room 115 Room 115	ken - see n 31A - No po A 32A - No p	nap for locat esitive activit cositive activites	y detected	pm 4) clean-u		oeginning and	end of shift	i
						<u></u>		
Technicia	ın/Surveyor:	Byron Blan Name	nd		Signature	Date:	4/11/2007	
Superviso	or/Reviewer:	Joseph W. Name	Moon, CHP	5-2-	Signature Signature	Date:	4/11/2007	

Room 114

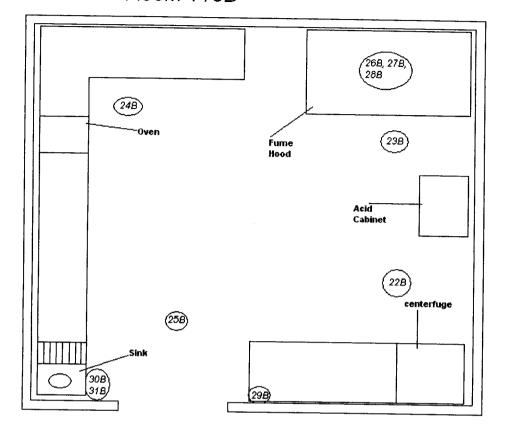
Fume Hood 10A - exhoust 1A - Floor 2A - Walls

8A - Top of bench 7A - In sink 9A - Top of bench



					Survey Requireme	ents		
Area Classification:	3				Beta	Gamı	ma	
Building/Area:	Room 114			Floor	20%			
Floor/Elevation:	Floor			Wall				
Survey Unit/Grid:				Ceiling				
Surface:	8 inch tile		Actual s	urveyed	40%			
Survey Type:	β scan 771	cm ² probe						
Date/Time:								
					Instrume	nt Informa	<u>tion</u>	
Floor Monitor I	D Number:				MARSS Inst ID:			
Alpha/Beta S	can Speed:	2.5 inches/s	ec		Logger Model:	2350-1		
Alpha/Beta Se	an Height:	1/2 inch		Lo	gger Serial Number:	149408		
Gamma S	can Speed:			•	Cal Due Date:	10/22/2007		
Gamma So	an Height:				Detector Model:	43-37-1		
<u> </u>				Det	ector Serial Number:	PR145081		,
Background Infor	<u>mation</u>							
Material	Bkgd Level	invest. Level	Alarm Level		Source Che	cks		
8 inch tile β Floor	618 cpm	1236 cpm		1		Date	Time	Initials
		i			Prior:	2/22/2007	1400	bwb
		i	· · · · · · · · · · · · · · · · · · ·		End:	2/22/2007	1655	bwb
				Note: Sou	rce checks required at b	eginning and	end of shif	t
Smears tal 1A through Highest po No positive Investigatic Static Mea Additional 31C throug	ken - see m 10A sitive smear activity dete on of positive surements o smears take th 38C all les ation Symbo found in exc	ected on any eresult on 3/ of Fume Hoo	on m/100 cm2 other smea 22/07 d walls and on each ver om/100 cm? Fume Hood G 1.86 (19	in C-14 ch ar glass with tical surfac 2 in C-14 ch I - should be 74) clean-u	e removed o guidelines	ctable activity		kground
Technicia	n/Surveyor:	Byron Bland	d		Pyren Plant	Date:	4/11/2007	
		Name			Signature	-		
Superviso	r/Reviewer:	Joseph W. I Name	Moon, CHP		Signature Signature	Date: _	4/11/2007	
L								

Room 113D

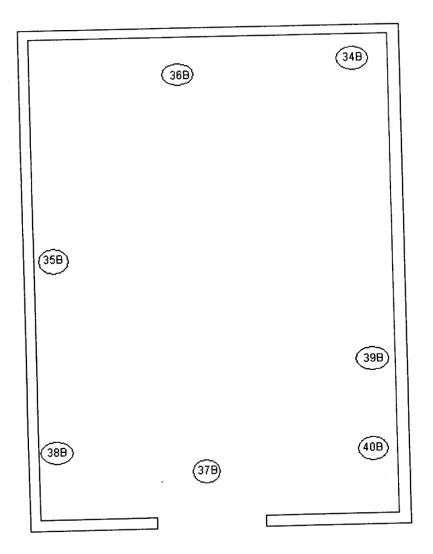


Fume hood

26B - floor 27B - Walls 28B - exhoust 23B - in fume hood drain

30B - Sink drain 31B - Under sink 29B - Bench top

Area Clas	sification:	1			Survey Requirements Beta Gamma						
		Room 113D		ı	Floor	100%		as rec	uired	j	
	Elevation:			•	Wall	10070				i	
ł	Unit/Grid:			Working	Surfaces	100%		100%		İ	
	Surface:	8 inch tile			urveyed	100%		100%		İ	
Sui		β scan 771 cr	n ² probe		•					i	
}		β scan 126 ci		•		<u> </u>			*		
1		γ scan μR me		•			Instrumen	t Informati	on		
1 .)ate/Time:	2/23/2007and									
1				•			β Floor	β hand held	γ µR meter		
Beta Sc	an Speed:	2.5 inches/se	С	Floo	r Monitor i	D Number:		2	Ludlum		
l .	an Height:		Ť			er Model:	2350-1	2350-1		•	
1	an Speed:		•	Lo	gger Seria		149408	149408		•	
	an Height:					Due Date:	10/22/2007	10/22/2007	9/19/2007	•	
1 '		172 111011	•			or Model:	43-37-1	43-68	Model 19	•	
				Det	ector Seria		PR145081	PR148454	182679	•	
)		Backgrou	ad Informs		ector Seria	i ivallibei.	F10145001	111140404	162073		
	88-4	Duongrou	Bkgd	invest.	Alarm	s	ource Che	cke			
1 .	Material		Level	Level	Level		<u> </u>				
		ch tile	618 cpm	1236 cpm		l		Date	Time	Initials	
		ich β Hand	239 cpm	478 cpm		β Floor	Prior:	2/23/2007	921	bwb	
1 1	μR/nr γ e	xposure rate	8-15 µR/hr	30 µR/hr			End:		1630	bwb	
j l					L	β hand	Prior:	3/22/2007	905	bwb	
								3/22/2007	1315	bwb	
	Highest sca Highest ha	an level seen i nd held measu en - see ma	rement was	on the front	monitor wa	ıs 680 cpm		ginning and en 1,500 dpm/10			
1	Smears 22	B through 33E	- No positive	e activity det	tected on flo	or, the fume	e hood interio	r or bench top	surfaces		
1		imple (67C) of	-	-				•		ation.	
ſ		ken of the liqu			•						
1	=	nd in excess o		. ,	an-up guide	elines only o	n the sink top	location			
			Attach surv	ey map to	this docum	ent					
	Technic	cian/Surveyor:		1		Pynn	1 hard	Date:	4/11/2007		
			Name			Signature					
	Supervi	sor/Reviewer:		Moon, CHP	57-	a jest (i)	77-7	Date:	4/11/2007		
			Name			Signature		_			

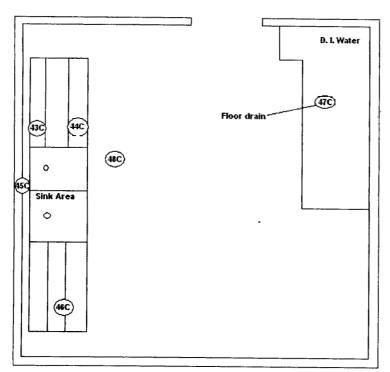


113C

38B - In sink drain 40B - Taken in fridge / freezer

						Survey R	Requiremen	nts		
rea Clas	sification:	1	•			В	eta	Gam	Gamma	
		Room 113C			Floor	100%		as req	uired	
	Elevation:	Floor			Wall					
	Unit/Grid:		· · · · · · · · · · · · · · · · · · ·	Working	Surfaces	100%		100%		
		8 inch tile		Actual s	urveyed	100%		100%		
Su	rvey Type:	β scan 771 cr	m² probe							
		β scan 126 c								
		γ scan μR me					<u>Instrumen</u>	t Informatio	<u>on</u>	
	Date/Time:	2/23/2007and	3/22/2007							
							β Floor	β hand held	γ µR meter	
Beta Sc	an Speed:	2.5 inches/se	С	Floor Monitor		D Number:	1	2	Ludlum	
	an Height:				Logg	er Model:	2350-1	2350-1		
	an Speed:			Lo	gger Seria		149408	149408		
•	an Height:					Due Date:	10/22/2007	10/22/2007	9/19/2007	
,					-	or Model:	43-37-1	43-68	Model 19	
				Dete	ector Seria		PR145081	PR148454	182679	
		Backgrou	nd Inform	ation					·············	
		Duongiou	19 11110111							
			Bkgd	Invest.	Alarm	_				
	Material		Level	Level	Level	<u> </u>	Source Che	cks		
1	8 in	ch tile	618 cpm	1236 cpm]		Date	Time	Initials
						0.51	Dulan	0.000.0007	921	bwb
		ch β Hand	239 cpm	478 cpm		β Floor	Prior:	2/23/2007	321	
	Lab ben		239 cpm 8-15 uR/hr	478 cpm 30 uR/hr		B Floor	End:	2/23/2007	1630	bwb
	Lab ben	ch β Hand xposure rate	239 cpm 8-15 µR/hr	478 cpm 30 μR/hr		1				
	Lab ben					β Floor β hand	End:	2/23/2007	1630	bwb
	Lab ben				Note: Sour	β hand	End: Prior: End:	2/23/2007 3/22/2007 3/22/2007	1630 905 1315	bwb bwb
ommen	Lab ben μR/hr γ ex				Note: Sour	β hand	End: Prior: End:	2/23/2007 3/22/2007	1630 905 1315	bwb bwb
ommen	Lab ben μR/hr γ ex	xposure rate	8-15 μR/hr	30 µR/hr		β hand ce checks r	End: Prior: End: equired at beg	2/23/2007 3/22/2007 3/22/2007	1630 905 1315	bwb bwb
ommen	Lab ben μR/hr γ ex nts: Highest sc	xposure rate	8-15 μR/hr	30 μR/hr	or monitor v	β hand ce checks r	End: Prior: End: equired at beg	2/23/2007 3/22/2007 3/22/2007	1630 905 1315	bwb bwb
ommen	Lab ben µR/hr y ex nts: Highest so: Highest ha	an level seen	8-15 μR/hr in this room urement wa	30 µR/hr with the floors background	or monitor v	β hand ce checks r	End: Prior: End: equired at beg	2/23/2007 3/22/2007 3/22/2007	1630 905 1315	bwb bwb
ommen	Lab ben µR/hr γ ex nts: Highest so: Highest ha Smears tal	an level seen nd held meas ken - see ma	8-15 µR/hr in this room urement wa	30 µR/hr with the floors background	or monitor v nd	β hand ce checks r	End: Prior: End: equired at beg	2/23/2007 3/22/2007 3/22/2007 ginning and end	1630 905 1315	bwb bwb
ommen	Lab ben µR/hr γ ex nts: Highest sc: Highest ha Smears tal Smears 34	an level seen nd held meas ken - see ma B through 39	8-15 µR/hr in this room urement wa up for locatio B - No positi	30 µR/hr with the flor s backgrour n ve activity d	or monitor v nd etected on	β hand ce checks rovas 775 cpn	End: Prior: End: equired at beg	2/23/2007 3/22/2007 3/22/2007 ginning and end	1630 905 1315	bwb bwb
ommen	Lab ben μR/hr γ ex highest so: Highest ha Smears tal Smears 34 Smear 40E	an level seen nd held meas ken - see ma B through 396 3 taken in the	8-15 μR/hr in this room urement wa ap for locatio B - No positi refrigerator/	with the flor s backgroun on ve activity d	or monitor v nd letected on wed positive	β hand ce checks revas 775 cpn floor or bene	End: Prior: End: equired at beg h ch top surface of activity	2/23/2007 3/22/2007 3/22/2007 ginning and end	1630 905 1315	bwb bwb
ommen	Lab ben µR/hr γ ex hts: Highest sc: Highest ha Smears tal Smears 34 Smear 40E Follow-up i	an level seen nd held meas ken - see ma B through 396 3 taken in the	in this room urement wa up for locatio B - No positi refrigerator/ of the refrige	with the flores background we activity defreezer show rater/freeze	or monitor v nd etected on wed positive r showed p	β hand ce checks revas 775 cpn floor or beneal indication cositive activi	End: Prior: End: equired at beg	2/23/2007 3/22/2007 3/22/2007 ginning and end	1630 905 1315	bwb bwb
ommen	Lab ben µR/hr γ ex hts: Highest sc: Highest ha Smears tal Smears 34 Smear 40E Follow-up i H-3 activity	an level seen nd held meas ken - see ma B through 39i 3 taken in the investigation of	in this room urement wa up for location B - No position refrigerator/ of the refrige	with the flores background we activity defreezer show rater/freezed C-14 activity	or monitor vind letected on wed positive or showed p	β hand ce checks revas 775 cpm floor or benea indication cositive activity 1/100 cm2.	End: Prior: End: equired at beg n ch top surface of activity ity at a maxim	2/23/2007 3/22/2007 3/22/2007 ginning and end	1630 905 1315 d of shift	bwb bwb bwb
ommen	Lab ben µR/hr γ ex hts: Highest sc: Highest ha Smears tal Smears 34 Smear 40E Follow-up i H-3 activity	an level seen nd held meas ken - see ma B through 39i 3 taken in the investigation of	in this room urement wa up for location B - No position refrigerator/ of the refrige	with the flores background we activity defreezer show rater/freezed C-14 activity	or monitor vind letected on wed positive or showed p	β hand ce checks revas 775 cpm floor or benea indication cositive activity 1/100 cm2.	End: Prior: End: equired at beg h ch top surface of activity ity at a maximi	2/23/2007 3/22/2007 3/22/2007 ginning and end	1630 905 1315 d of shift	bwb bwb bwb
ommen	Lab ben µR/hr γ ex hts: Highest sc: Highest ha Smears tal Smears 34 Smear 40E Follow-up i H-3 activity	an level seen nd held meas ken - see ma B through 39i 3 taken in the investigation of	in this room urement wa up for location B - No position refrigerator/ of the refrige	with the flores background we activity defreezer show rater/freezed C-14 activity	or monitor vind letected on wed positive or showed p	β hand ce checks revas 775 cpm floor or benea indication cositive activity 1/100 cm2.	End: Prior: End: equired at beg h ch top surface of activity ity at a maximi	2/23/2007 3/22/2007 3/22/2007 ginning and end	1630 905 1315 d of shift	bwb bwb bwb
ommen	Lab ben µR/hr γ ex nts: Highest so: Highest ha Smears tal Smears 34 Smear 40E Follow-up i H-3 activity The refriger	an level seen nd held meas ken - see ma B through 39i 3 taken in the investigation of y of 107 dpm/ erator/freezer a	in this room urement wa up for locatio B - No positi refrigerator/ of the refrige 100 cm2 and activity is no	with the flor s background on ve activity defreezer show crator/freezed d C-14 activity t fixed and of	or monitor vand letected on wed positive or showed pity of 20 dpidoes not ex	β hand ce checks revas 775 cpm floor or beneal indication consitive activity 1/100 cm2. ceed the cle	End: Prior: End: equired at beg h ch top surface of activity ity at a maximi	2/23/2007 3/22/2007 3/22/2007 ginning and end	1630 905 1315 d of shift	bwb bwb bwb
ommen	Lab ben µR/hr γ ex hts: Highest so: Highest ha Smears tal Smears 34 Smear 40E Follow-up i H-3 activity The refriger	an level seen nd held meas ken - see ma B through 39i 3 taken in the investigation of	in this room urement wa up for locatio B - No positi refrigerator/ of the refrige 100 cm2 and activity is no	with the flor s background on ve activity defreezer show crator/freezed d C-14 activity t fixed and of	or monitor vand letected on wed positive or showed pity of 20 dpidoes not ex	β hand ce checks revas 775 cpm floor or beneal indication consitive activity 1/100 cm2. ceed the cle	End: Prior: End: equired at beg h ch top surface of activity ity at a maximi	2/23/2007 3/22/2007 3/22/2007 ginning and end	1630 905 1315 d of shift	bwb bwb bwb
ommen	Lab ben µR/hr γ ex hts: Highest so: Highest ha Smears tal Smears 34 Smear 40E Follow-up i H-3 activity The refriger	an level seen nd held meas ken - see ma B through 39i 3 taken in the investigation of y of 107 dpm/ erator/freezer a	in this room urement wa up for location B - No positi refrigerator/ of the refrige 100 cm2 and activity is no	with the floors background ve activity defreezer show the floor of the	or monitor vend letected on wed positive or showed prity of 20 dprity of execution (a) clean-up	β hand ce checks revas 775 cpm floor or benea indication of cositive activity m/100 cm2. ceed the cle guidelines	End: Prior: End: equired at beg h ch top surface of activity ity at a maximi	2/23/2007 3/22/2007 3/22/2007 ginning and end	1630 905 1315 d of shift	bwb bwb bwb
ommen	Lab ben µR/hr γ ex hts: Highest so: Highest ha Smears tal Smears 34 Smear 40E Follow-up i H-3 activity The refriger	an level seen nd held meas ken - see ma B through 39i 3 taken in the investigation of y of 107 dpm/ erator/freezer a	in this room urement wa up for location B - No positi refrigerator/ of the refrige 100 cm2 and activity is no	with the flor s background on ve activity defreezer show crator/freezed d C-14 activity t fixed and of	or monitor vend letected on wed positive or showed prity of 20 dprity of execution (a) clean-up	β hand ce checks revas 775 cpm floor or benea indication of cositive activity m/100 cm2. ceed the cle guidelines	End: Prior: End: equired at beg h ch top surface of activity ity at a maximi	2/23/2007 3/22/2007 3/22/2007 ginning and end	1630 905 1315 d of shift	bwb bwb bwb
ommen	Lab ben µR/hr γ ex hts: Highest so: Highest ha Smears tal Smears 34 Smear 40E Follow-up i H-3 activity The refriger	an level seen nd held meas ken - see ma B through 39i 3 taken in the investigation of y of 107 dpm/ erator/freezer a	in this room urement wa up for location B - No positi refrigerator/ of the refrige 100 cm2 and activity is no	with the floors background ve activity defreezer show the floor of the	or monitor vend letected on wed positive or showed prity of 20 dprity of execution (a) clean-up	β hand ce checks revas 775 cpm floor or benea indication of cositive activity m/100 cm2. ceed the cle guidelines	End: Prior: End: equired at beg h ch top surface of activity ity at a maximi	2/23/2007 3/22/2007 3/22/2007 ginning and end	1630 905 1315 d of shift	bwb bwb bwb
ommen	Lab ben µR/hr γ ex hts: Highest scale Highest has Smears 34 Smear 40E Follow-up in H-3 activity The refriger No activity	an level seen nd held meas ken - see ma B through 39i B taken in the investigation of of 107 dpm/ erator/freezer a	in this room urement wa up for location B - No position refrigerator/ of the refriger 100 cm2 and activity is no	with the floors background we activity defreezer show the fixed and control of the fixed and con	or monitor vend letected on wed positive or showed prity of 20 dprity of execution (a) clean-up	β hand ce checks revas 775 cpm floor or bende indication of cositive activity 1/100 cm2. ceed the cle guidelines ment	End: Prior: End: equired at beg n ch top surface of activity ity at a maximi	2/23/2007 3/22/2007 3/22/2007 ginning and end	1630 905 1315 d of shift	bwb bwb bwb
ommen	Lab ben µR/hr γ ex hts: Highest scale Highest has Smears 34 Smear 40E Follow-up in H-3 activity The refriger No activity	an level seen nd held meas ken - see ma B through 39i 3 taken in the investigation of y of 107 dpm/ erator/freezer a	in this room urement wa up for location B - No position refrigerator/ of the refrigerator activity is no uses of the Ro Attach sur	with the floors background we activity defreezer show the floor of the	or monitor vend letected on wed positive or showed prity of 20 dprity of execution (a) clean-up	β hand ce checks revas 775 cpm floor or benea indication of consitive activity 1/100 cm2. ceed the cle guidelines ment	End: Prior: End: equired at beg ch top surface of activity ity at a maximi	2/23/2007 3/22/2007 3/22/2007 ginning and end	1630 905 1315 d of shift	bwb bwb bwb
ommer	Lab ben µR/hr γ ex hts: Highest scale Highest has Smears 34 Smear 40E Follow-up in H-3 activity The refriger No activity	an level seen nd held meas ken - see ma B through 39i B taken in the investigation of of 107 dpm/ erator/freezer a	in this room urement wa up for location B - No position refrigerator/ of the refriger 100 cm2 and activity is no	with the floors background we activity defreezer show the floor of the	etected on wed positive or showed positive or showed point of 20 dpi does not ex	β hand ce checks revas 775 cpm floor or bende indication of cositive activity 1/100 cm2. ceed the cle guidelines ment Signature	End: Prior: End: equired at beg ch top surface of activity ity at a maximi	2/23/2007 3/22/2007 3/22/2007 ginning and end	1630 905 1315 d of shift	bwb bwb bwb
ommer	Lab ben µR/hr γ ex nts: Highest sc: Highest ha Smears 34 Smear 40E Follow-up i H-3 activity The refriger No activity	an level seen nd held meas ken - see ma B through 39i B taken in the investigation of of 107 dpm/ erator/freezer a found in exce	in this room urement wa up for location B - No positi refrigerator/ of the refrige 100 cm2 and activity is no	with the floors background we activity defreezer show the floor of the	etected on wed positive r showed positive r showed point does not ex	β hand ce checks revas 775 cpm floor or bende indication of cositive activity 1/100 cm2. ceed the cle guidelines ment Signature	End: Prior: End: equired at beg ch top surface of activity ity at a maximi	2/23/2007 3/22/2007 3/22/2007 ginning and end s um ne for removab	1630 905 1315 d of shift	bwb bwb bwb
ommer	Lab ben µR/hr γ ex nts: Highest sc: Highest ha Smears 34 Smear 40E Follow-up i H-3 activity The refriger No activity	an level seen nd held meas ken - see ma B through 39i B taken in the investigation of of 107 dpm/ erator/freezer a	in this room urement wa up for location B - No positi refrigerator/ of the refrige 100 cm2 and activity is no	with the flores background we activity defreezer show the flores of C-14 activity of fixed and control of the flores of C-14 activity of fixed and control of the flores of C-14 activity of flores of C-14 activity of flores of C-15 activity of the flores of C-15 activity of C-15	etected on wed positive r showed positive r showed point does not ex	β hand ce checks revas 775 cpm floor or bende indication of cositive activity 1/100 cm2. ceed the cle guidelines ment Signature	End: Prior: End: equired at beg n ch top surface of activity ity at a maximi ean-up guidelin	2/23/2007 3/22/2007 3/22/2007 ginning and end s um ne for removab	1630 905 1315 d of shift	bwb bwb

Room 113B



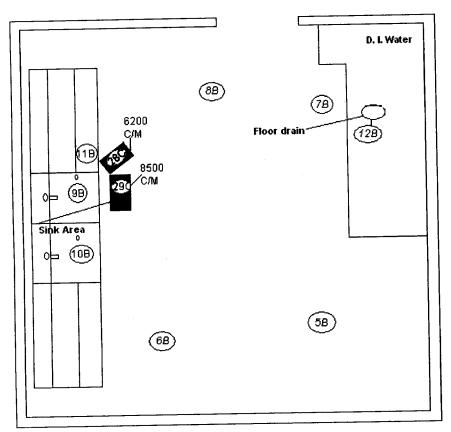
Direct measurements of contaminated surfaces with a model 43-68 proportional hand held detector directly on the areas shown on the map where smears were obtained

Location Measurement

43C	1,340,000 dpm/100cpm ²
44C	8500 dpm/100cpm ²
45C	21,750 dpm/100cpm ²
46C	BKG
48C	14,600 dpm/100cpm ²

				-	Requireme			
Area Classification:1					eta	Gam		
Building/Area: Room 1			Floor	100%		as req	uired	
Floor/Elevation: Floor	<u>r</u>		Wall					
Survey Unit/Grid:	·		Surfaces	100%		100%	[
Surface: 8 inch t		Actual s	urveyed	100%		100%		
Survey Type: β scan								
β scan	126 cm ² probe							
	µR meter				Instrumer	nt Informa	<u>tion</u>	i
Date/Time: 2/23/20	07and 3/22/200	7						
		•			β Floor	β hand held	γ µR meter	
Beta Scan Speed: 2.5 inch	<u>nes/</u> sec	Floo	r Monitor I	D Number:	1	2	Ludlum	
Beta Scan Height: 1/2 inch	1		Logg	er Model:	2350-1	2350-1		
γ Scan Speed:		Lo	gger Seria	Number:	149408	149408		
γ Scan Height: 1/2 inch	1			Due Date:	10/22/2007	10/22/2007	9/19/2007	
			Detect	or Model:	43-37-1	43-68	Model 19	
		Dete	ctor Seria	Number:	PR145081	PR148454	182679	
_			,0.0, 00.10					
<u>Backe</u>	ground Infor	<u>mation</u>						
	Bkgd	Invest.	Alarm	e.	ourse Che	alea		ļ
Material	Level	Level	Level	_ 	ource Che	<u>CKS</u>		
8 inch tile	618 cpm	1236 cpm				Date	Time	Initials
Lab bench β Har		478 cpm		β Floor	Prior:	2/23/2007	921	bwb
μR/hr γ exposure i	rate 8-15 µR/hr	30 μR/hr	<u> </u>]	-	2/23/2007	1630	bwb
			<u></u>	β hand	Prior:	3/22/2007	905	dwd
Comments:					End:	3/22/2007	1315	bwb
Initial Survey 2/23/	'07		Note: Sour	ce checks	required at be	eginning and	end of shift	
One floor region w		contaminat			•	•		
Highest hand held								
Two areas were fo							,	
The highest readin						Suivey.		
Smears taken - s	-		pii# 120 ciii	DCINCOLL	no radoets			
Floor smears in Ro			28C (floor	hot spot) - '	No positive a	ctivity detecte	ed	
Smear samples 12		-				-	-	
Follow-up Survey		און שטו מווג	jik siik dia	iii) iiidioatot	a positive acti	vity		
Highest µR meter		een in this	room was h	ackaround				
Highest hand held						98		
was 321,000 cpm/							n .	
Decon sink smear								
and 5389 dpm/100	•				•			xcess
of clean-up guideli						, , , , , , , , , , , , , , , , , , , ,	, , , , , , , , , , , , , , , , , , , ,	
	Attach su							
				, .				
Technician/Surve	yor: Byron Blai	nd		,	The met	_ Date:	4/11/2007	
1	Name			Signature	•	_		
1			c::>		177,000			
Supervisor/Reviev			<u> </u>	1-1	- James -	_ Date:	4/11/2007	
1	Name			Signature	•			

Room 113B



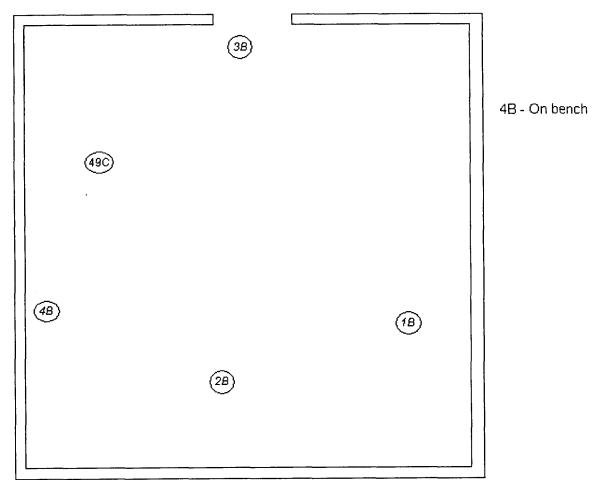
11B - Bench top 12B - Floor drain 10B - In sink drain

9B - In sink drain

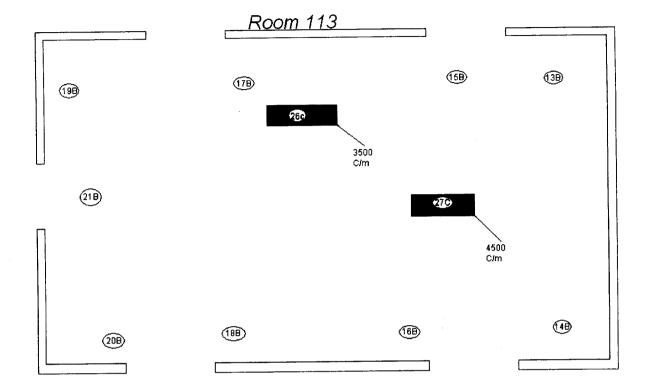
29C - Between faucets

						Survey I	Requiremen	ts		
Area Clas	sification:	1				-	3eta	Gam	ıma	
Buil	ding/Area: Roo	m 113A			Floor	100%		as rec	uired	1
Floor	Elevation:	Floor			Wall					İ
Survey	Unit/Grid:			Working	Surfaces	100%	•	100%		İ
_	Surface: 8 in	nch tile		Actual s	surveyed	100%)	100%	l	
Su	rvey Type: βsc	an 771 c	m² probe	1						
			m² probe	•						•
	γsc	an µR m	eter	1			Instrument	t Informatio	on	
	Date/Time: 2/23	3/2007an	d 3/22/2007						_	
				•			β Floor	β hand held	γ µR meter	
Beta So	an Speed: 2.5	inches/se	ec	Floo	or Monitor I	D Number:	: 1	2	Ludlum	
Beta Sc	an Height: 1/2 i	inch			Logg	er Model:	2350-1	2350-1		
γ Sc	can Speed:			Lo	ogger Seria	Number:	149408	149408		
γSc	an Height: 1/2	inch			Cal	Due Date:	10/22/2007	10/22/2007	9/19/2007	_
					Detect	or Model:	43-37-1	43-68	Model 19	_
				Det	ector Seria	l Number:	PR145081	PR148454	182679	_
}	Bac	<u>ckgrou</u>	nd Inforn	nation						•
	54 -41 - 1		Bkgd	Invest.	Alarm	9	Source Che	cke		
	Material		Level	Level	Level	3	JOUI GO GIIG			
]	8 inch tile		618 cpm	1236 cpm				Date	Time	Initials
1	Lab bench β		239 cpm	478 cpm		β Floor	Prior:	2/23/2007	921	bwb
	μR/hr γ exposu	ure rate	8-15 µR/hr	30 μR/hr			End:		1630	bwb
					<u> </u>	β hand	Prior:	3/22/2007	905	bwb
							End:	3/22/2007	1315	bwb
					Note: Sour	ce checks i	required at beg	inning and end	d of shift	
Commer	its:									
				20.0.5	.,	700				
	Highest scan le					•				
	Highest hand he			•	n/Tuucm2 (3	зэ,ооо арт	/100cm2) on th	ie ila of the sp	ea concentra	ator.
	Smears taken -		•		atad an flac	or bonob t	on surfaces			
	Smears 1B thro Smear on lid of	•	-	•			•			
	1147 dpm/100 d	•		• •	_		mination level o)i		
]	1147 apin/100 t	51112 OI 11	-Janu 1510	apina 100 c	AII					
	Activity was det	ected in	excess of th	e RG 1 86	(1974) clear	aun quideli	nes on a niece	of equipment		
	(Speed concent				• •					
	as well as the to	,				vity execut	0 410 101110140			
			,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,							
			Attach sur	vev map to	this docu	ment				
						10000	F kant		***	
	Technician/S	urveyor:	Byron Blar	nd				Date:	4/11/2007	_
		•	Name			Signature	•			
	_				52-	enfa	1 272			
	Supervisor/R	eviewer:		Moon, CHF	· · ·			Date:	4/11/2007	
1			Name			Signature	•			

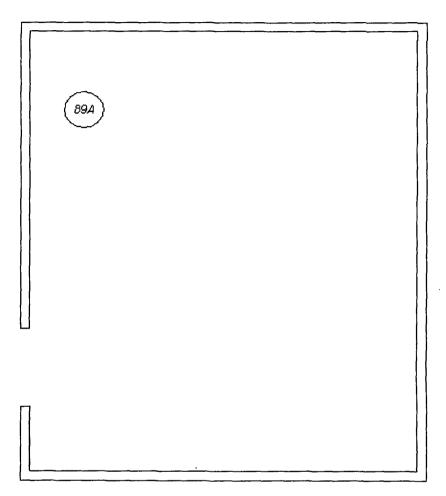
Room 113A

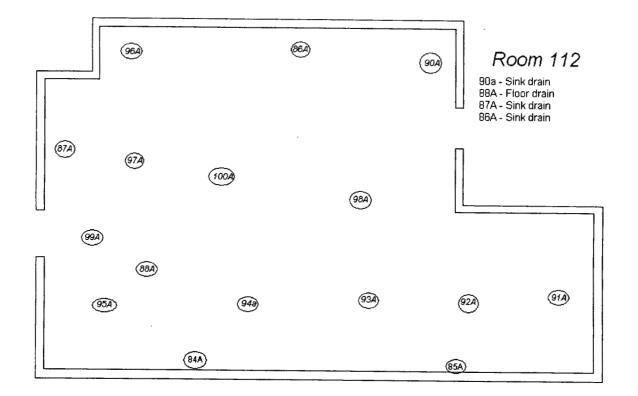


						Survey R	Requireme	nts		
Area Clas	ssification:	1				В	eta	Gam	ma	
Buil	iding/Area:	Room 113			Floor	100%		as req	uired	
Floor	/Elevation:	Floor			Wall					
Survey	Unit/Grid:			Working	Surfaces	100%		100%		
	Surface:	8 inch tile		Actual s	urveyed	100%		100%		
Su	rvey Type:	β scan 771	cm² probe					-		
	,	β scan 126	cm ² probe							i
		γ scan μR r					Instrumer	nt Informat	ion	
1	Date/Time:	2/23/2007a	nd 3/22/200	7					<u></u>	
							β Floor	β hand held	γ µR meter	
Beta Sc	can Speed:	2.5 inches/s	sec	Floo	r Monitor I	D Number:	1	2	Ludlum	
Beta Sc	an Height:	1/2 inch			Logg	jer Model:	2350-1	2350-1		
γSc	can Speed:			Lo	gger Seria	l Number:	149408	149408		
γ Sc	an Height:	1/2 inch			Cal	Due Date:	10/22/2007	10/22/2007	9/19/2007	
					Detect	or Model:	43-37-1	43-68	Model 19	
				Dete	ector Seria	Number:	PR145081	PR148454	182679	
		Rackgro	und Infor						102070	
		Dackgro	una mior	Hation						
			Bkgd	Invest.	Alarm					
	Material		Level	Level	Level	<u>s</u>	<u>ource Che</u>	<u>cks</u>		
	8 inc	h tile	618 cpm	1236 cpm	Γ	1		Date	Time	Initials
	Lab bend	h β Hand	239 cpm	478 cpm		β Floor	Prior:	2/23/2007	921	bwb
	μR/hr γ ex	posure rate	8-15 µR/hr	30 µR/hr		1	End:	2/23/2007	1630	bwb
						β hand	Prior:	3/22/2007	905	bwb
					· · · · · · · · · · · · · · · · · · ·	•	End:	3/22/2007	1315	bwb
					Note: Sour	ce checks re	equired at be	ginning and e	nd of shift	
Commen	nts:					-				
	Two floor re	egions were	detected as	contamina	ted above ti	he Investiga	tion level by t	he floor monit	or	
	Highest har	nd held mea	surement o	these two	floor areas	was 4500 cp	om/126 cm ² (16,750 dpm/1	00cm ²)	
	Highest µR	meter mea	surement se	en in this ro	oom was ba	ckground				
	Smears tak	en - see m	ap for locat	ion						
	Floor smea	rs in Room	113 13B thr	ough 21B -	No positive	activity dete	cted except 2	21B (15 dpm/	100cm²)	
	Floor activit	ty was detec	ted in exces	s of the RO	3 1.86 (1974	4) clean-up g	guidelines			
	This activity	/ appears to	be fixed into	the floor s	urface					
			Attach sur	vey map to	this docu	ment				
		_								
						Pynn	167 Just			
	Technicia	n/Surveyor:		d				Date:	4/11/2007	
			Name			Signature				
					ورجي	a period to	17/200			
	Superviso	r/Reviewer:		Moon, CHP	1			Date:	4/11/2007	•
			Name			Signature				



Room 112A



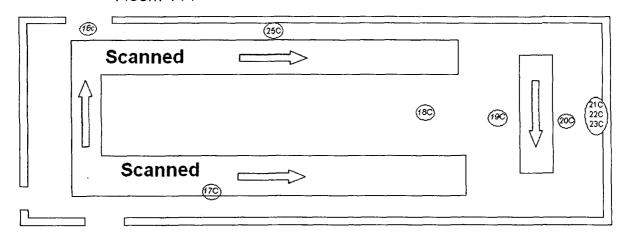


						Survey R	Requiremer	ıts		
Area Clas	ssification:	1				-	eta	Gam	ma	
	Iding/Area: Roo		and 112A		Floor	10	00%	as req	uired	
i		loor			Wall			<u> </u>		
Survey	Unit/Grid: Rad	d Lab an	d Office	Working	Surfaces	10	00%	100%		
}	Surface: 8 in			_	urveyed	10	00%	100%		
Su	rvey Type: β so	can 771	cm ² probe		-					
			cm ² probe		'					
ł		can µR n					Instrumen	t Informat	<u>ion</u>	
ļ	Date/Time: 2/2:	3/2007a	nd 3/22/200	7						
							β Floor	$\boldsymbol{\beta}$ hand held	γ µR meter	
Beta S	can Speed: 2.5	inches/s	sec	Floo	r Monitor I	D Number:	1	2	Ludlum	
Beta So	an Height: 1/2	inch			Logg	er Model:	2350-1	2350-1		
γ S	can Speed:			Lo	gger Serial	Number:	149408	149408		
γSo	can Height: 1/2	inch			Cal	Due Date:	10/22/2007	10/22/2007	9/19/2007	
						or Model:	43-37-1	43-68	Model 19	
į					ector Seria	Number:	PR145081	PR148454	182679	
	<u>Ba</u>	ckgro	<u>und Infor</u>	<u>mation</u>						
1			Disad	lavent	A La was					
	Material		Bkgd Level	invest. Level	Alarm Level	<u>s</u>	ource Che	<u>cks</u>		
	8 inch tile	e	618 cpm	1236 cpm		1		Date	Time	Initials
	Lab bench β	Hand	239 cpm	478 cpm		β Floor	Prior:	2/23/2007	921	bwb
	μR/hr γ exposu	ure rate	8-15 µR/hr	30 µR/hr			End:	2/23/2007	1630	bwb
i						β hand	Prior:	3/22/2007	905	bwb
Ì						•	End:	3/22/2007	1315	bwb
1					Note: Sour	ce checks re	equired at beg	inning and ei	nd of shift	
Comme	nts:									
{	Highest Floor N	Monitor s	can level se	en in this ro	oom was 78	7β срт				
	Highest hand h	eld scar	i level seen	in this room	ı was backg	round				
1	Highest µR me				oom was ba	ckground				
	Smears taken	- see m	ap for locat	ion						
	01 1-1	44	0.04445		. 100A N-					
i	Sink drains in F			•		•	ivity detected			
	Floor drain in R				-		tected			
	Floor smear in			-	•	•	IOUIOU			
	No activity four				,					
	. to don't, four		,		, 5.55.7 01					
			A44In		dita da son					
			Attach sur	vey map to	this docur	nent				
			D			Pynn	" buch		4/44/222=	
1	Technician/Su	urveyor:	Byron Blar Name	ia .		Signature		Date:	4/11/2007	
1			ivanie		. samuele	-				
	Supervisor/Re	eviewer:	Joseph W.	Moon, CHP	وراستار ا	a people (s)	1/000	Date:	4/11/2007	

Signature

Name

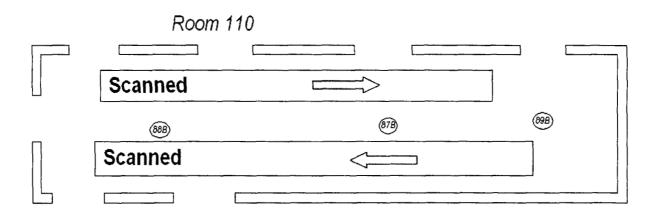
Room 111



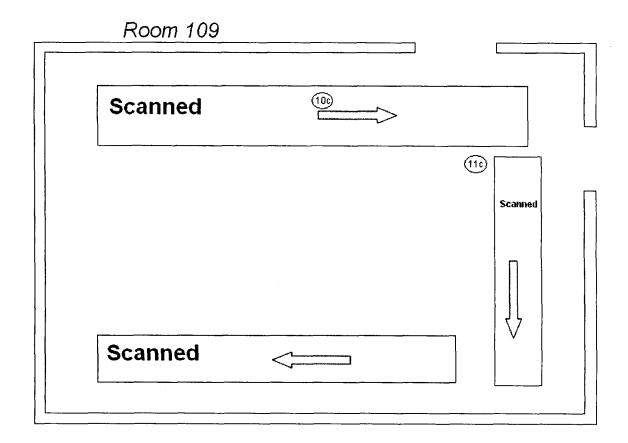
25C - in sink

Fume Hood 21C - floor 22C - walls 23C - exhaust

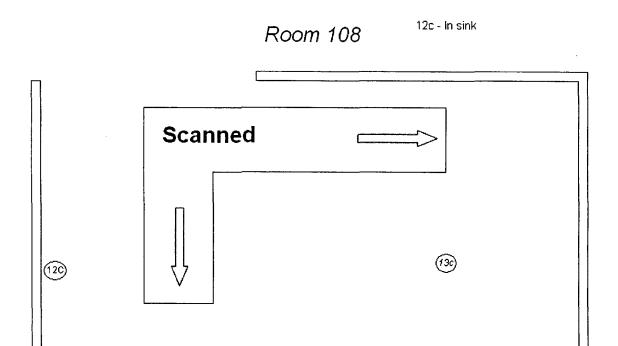
				Survey Requi	iremei			
Area Classification:				Beta		Gamr	na	ı
Building/Area:				Floor 20%				
Floor/Elevation:				Wall	— <u>-</u> -			
Survey Unit/Grid:				Ceiling				İ
	8 inch tile	2 .	Actua	il surveyed 35%				İ
Survey Type:		cm probe	•					ı
Date/Time:	2/23/2007							
				<u>Inst</u>	rumer	t Informa	ion	
Floor Monitor				MARSS Ins	it ID:			
Alpha/Beta S	can Speed:	2.5 inches/s	sec	Logger Mo	odel: _	2350-1		
Alpha/Beta S	can Height:	1/2 inch		Logger Serial Num	_			
Gamma S	can Speed:			Cal Due D	_	10/22/2007		
Gamma S	can Height:			Detector Mo	_	43-37-1		•
				Detector Serial Num	nber: _	PR145081		
Background Info	<u>rmation</u>							
	5 1		A1					
Material	Bkgd Level	Invest. Level	Alarm Level	Source	e Chec	ks		
				1		Date	Time	Initials
8 inch tile	618 cpm	1236 cpm			Delos	2/23/2007	925	bwb
	 					2/23/2007	1635	bwb
	 			-	Eng.	2/23/2001	1035	DWD
				Note: Source checks requir	red at he	aginning and	and of shi	F t
	<u> </u>	٠	L	Mote. Course checks requir	ou at b	29##### CITIC	0110 01 0111	
Comments:								
	an level see	n in this roo	m was 701	com				
-	ken - see m							
		•		ins - No positive activity deter	cted			
	-			o positive activity detected				
21000	J. 200 C							
No activity	found in exc	ess of the F	RG 1.86 (19	74) clean-up guidelines				
·								
		Attach sur	vey map to	this document				
				1.7	1			
Tash-:-:	on/Cur our	Buron Blor	nd	A Syrik to 1 to	A1.	Date	4/11/2007	
Technici	an/Surveyor:			Signature	<i>(1)</i>	Date:	4/11/2007	-
Technici	an/Surveyor:	Byron Blar Name		Signature		Date: _	4/11/2007	<u>-</u>
	·	Name		Signature		•		-
	an/Surveyor: or/Reviewer:	Name	Moon, CHF	Signature		•	4/11/2007 4/11/2007	-



Area Classification: 3 Building/Area: Room 110 Floor 20 Floor/Elevation: Floor Wall Survey Unit/Grid: Ceiling Surface: sealed concrete Survey Type: β scan 771 cm² probe Date/Time: 2/23/2007 Floor Monitor ID Number: MA Alpha/Beta Scan Speed: 2.5 inches/sec Lo Alpha/Beta Scan Height: 1/2 inch Logger Set Gamma Scan Speed: C Gamma Scan Height: Detector Set	RSS Inst ID:	Gamn Gamn nt Informat		
Building/Area: Room 110 Floor 20 Floor/Elevation: Floor Wall Survey Unit/Grid: Ceiling Surface: sealed concrete Actual surveyed 40 Survey Type: β scan 771 cm² probe Date/Time: 2/23/2007 Floor Monitor ID Number: MA Alpha/Beta Scan Speed: 2.5 inches/sec Lo Alpha/Beta Scan Height: 1/2 inch Logger Set Gamma Scan Speed: C Gamma Scan Height: Detector Set	Instrume			
Floor/Elevation: Floor Wall Survey Unit/Grid: Sealed concrete Survey Type: β scan 771 cm² probe Date/Time: 2/23/2007 Floor Monitor ID Number: MA Alpha/Beta Scan Speed: 2.5 inches/sec Lo Alpha/Beta Scan Height: 1/2 inch Logger Sea Gamma Scan Height: Detector Sea	Instrume RSS Inst ID: gger Model:	nt Informat	tion	
Survey Unit/Grid: Surface: sealed concrete Survey Type: S scan 771 cm² probe Date/Time: 2/23/2007	Instrume RSS Inst ID: ogger Model:	nt Informat	ion	
Surface: sealed concrete Survey Type: \$\beta \text{ scan 771 cm}^2 \text{ probe}\$ Date/Time: 2/23/2007 Floor Monitor ID Number: MA Alpha/Beta Scan Speed: 2.5 inches/sec Lo Alpha/Beta Scan Height: 1/2 inch Logger Set Gamma Scan Height: C Gamma Scan Height: Detector Set	Instrume RSS Inst ID: ogger Model:	nt Informat	ion	
Survey Type: \$\beta \text{ scan 771 cm}^2 \text{ probe}\$ Date/Time: \(\frac{2}{223/2007}\) Floor Monitor ID Number: MA Alpha/Beta Scan Speed: 2.5 inches/sec Lo Alpha/Beta Scan Height: \(\frac{1}{2}\) inch Logger Sec Gamma Scan Speed: C Gamma Scan Height: Detector Sec	Instrume RSS Inst ID: ogger Model:	nt Informat	tion	
Floor Monitor ID Number: Alpha/Beta Scan Speed: 2.5 inches/sec Lo Alpha/Beta Scan Height: 1/2 inch Logger Sec Gamma Scan Speed: C Gamma Scan Height: Detector Sec	RSS Inst ID:	nt Informat	tion	
Floor Monitor ID Number: Alpha/Beta Scan Speed: 2.5 inches/sec Alpha/Beta Scan Height: 1/2 inch Gamma Scan Speed: C Gamma Scan Height: Detector Se	RSS Inst ID:	nt Informat	tion	
Alpha/Beta Scan Speed: 2.5 inches/sec Lo Alpha/Beta Scan Height: 1/2 inch Logger Set Gamma Scan Speed: C Gamma Scan Height: Detector Set	gger Model:			
Alpha/Beta Scan Height: 1/2 inch Logger Set Gamma Scan Speed: C Gamma Scan Height: Detector Set		0050.4		
Gamma Scan Speed: C Gamma Scan Height: Detector Se	Logger Model: 2350-1			
Gamma Scan Height: Detector Se		149408		
Detector Se	-	10/22/2007		
	ector Model:	43-37-1		
The articles are all the firm and a 41 are	rial Number: _	PR145081		
Background Information				
Bkgd Invest. Alarm Material Level Level	Source Che	cks		
sealed concrete 929 cpm 1.86k cpm		Date	Time	Initials
	Prior:	2/23/2007	925	bwb
	End:	2/23/2007	1635	bwb
Note: Source chec	ks required at t	eginning and	end of shift	t
Comments: Highest scan level seen in this room was 923 cpm Smears taken - see map for location 88B & 89B on floor and 87B on floor drain - No positive activity dete				
Attach survey map to this document	an tikurd	Data	4/4.4/2007	
rechnician/Surveyor. Byron bland		Date: _	4/11/2007	
	277-	Date:	4/11/2007	
Supervisor/Reviewer: Joseph W. Moon, CHP	ıre	-		•

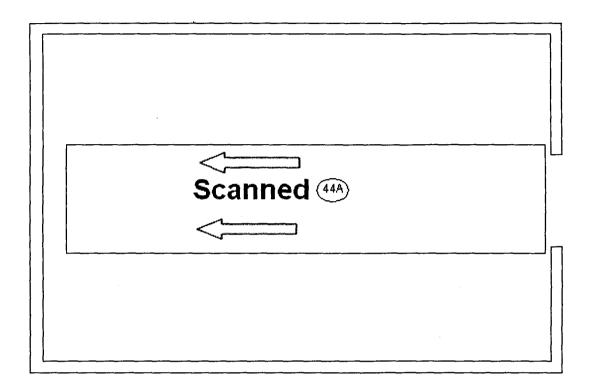


					Survey Requireme	ents		
Area Classification:	3				Beta	Gamr	na	
Building/Area:				Floor	20%			
Floor/Elevation:				Wall				
Survey Unit/Grid:				Ceiling				
1 -	8 inch tile		Actua	l surveyed	30%			
Survey Type:		cm ² probe		-				
Date/Time:				!				
Floor Monitor I Alpha/Beta Se		2.5 inches/s	sec		<u>Instrume</u> MARSS Inst ID: Logger Model:	nt Informat	tion	
Alpha/Beta So	an Height:	1/2 inch		Lo	gger Serial Number:	149408		
Gamma Se	can Speed:			-	Cal Due Date:	10/22/2007		
Gamma So	can Height:				Detector Model:	43-37-1		
				Det	ector Serial Number:	PR145081		
Background Infor	mation							
Material	Bkgd Level	invest. Level	Alarm Level		Source Che	cks		
8 inch tile	618 cpm	1236 cpm	20701	1		Date	Time	Initials
o inch the	o ro cpm	1230 chiu		1	Prior	2/23/2007	925	bwb
				1		2/23/2007	1635	bwb
	-			1	Liiu.	-: LO: LOO!	1000	240
				Note: So	rce checks required at t	peginning and	end of shift	
Smears tal	an level seer ken - see m or and 11C c	ap for locat	tion		detected			
No activity	found in exc			74) clean-u				
Technicia	an/Surveyor:	Byron Blar	nd		Pynn Charl	Date:	4/11/2007	
1		Name	•		Signature			
Superviso	or/Reviewer:	Joseph W.	Moon, CHF	وردي	eph a Man	Date:	4/11/2007	
		Name			Signature			

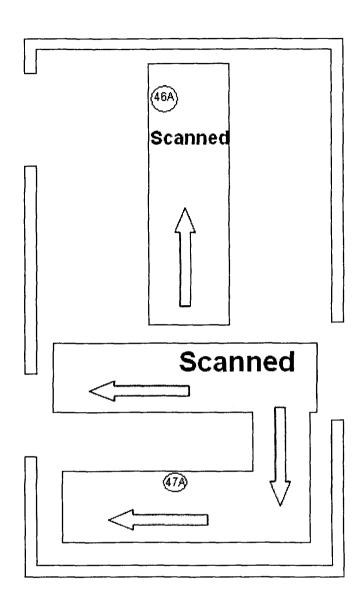


					Survey Requireme	ents		ľ		
Area Classification:	3				Beta	Gamn	na	1		
Building/Area:	Rooms 120	, 120A & 12	0B	Floor	20%			ĺ		
Floor/Elevation:	Floor			Wall						
Survey Unit/Grid:				Ceiling				ļ		
	8 inch tile		Actual s	urveyed	35%			Ì		
Survey Type:	β scan 771	cm ² probe								
Date/Time:	2/22/2007									
					Instrume	ent Informat	ion .			
Floor Monitor I	D Number:				MARSS Inst ID:			1		
Alpha/Beta So	an Speed:	2.5 inches/s	ec		Logger Model:	2350-1				
Alpha/Beta Sc	an Height:	1/2 inch		Logger Serial Number: 149408						
Gamma So	an Speed:				Cal Due Date:	10/22/2007				
Gamma So	an Height:				Detector Model:	el: 43-37-1				
				Det	tector Serial Number:	PR145081				
Background Infor	<u>mation</u>							ì		
Material	Bkgd Level	invest. Level	Alarm Level		Source Che	ecks				
8 inch tile β Floor	618 cpm	1236 cpm		Ì		Date	Time	Initials		
					Prior:	2/22/2007	1400	bwb		
					End:	2/22/2007	1655	bwb		
				Note: So	urce checks required at l	beginning and	end of shift	:		
Comments: Highest scan level seen in this room was 720 cpm Smears taken - see map for location 45A through 48A - No positive activity detected Carpeted floor surfaces Note: partitions delineating closet space Room 120C no longer present No activity found in excess of the RG 1.86 (1974) clean-up guidelines Attach survey map to this document										
					3 1 1 F					
Technicia	n/Surveyor:	Byron Blan	d		A Buch Chant	Date:	4/11/2007			
		Name			Signature			j		
Superviso	r/Reviewer:	Joseph W. Name	Moon, CHP		Signature Signature	Date:	4/11/2007	:		
<u></u>										

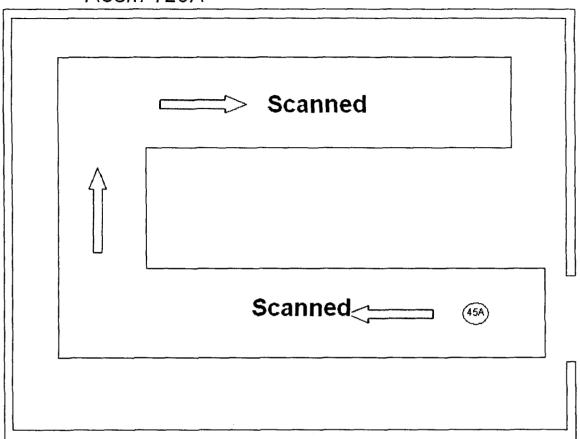
Room 119



Room 120

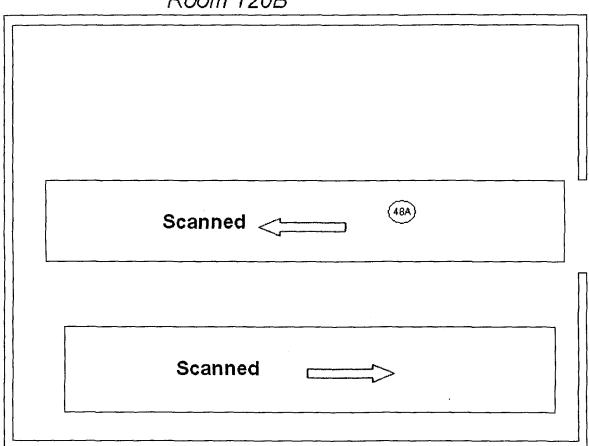


Room 120A

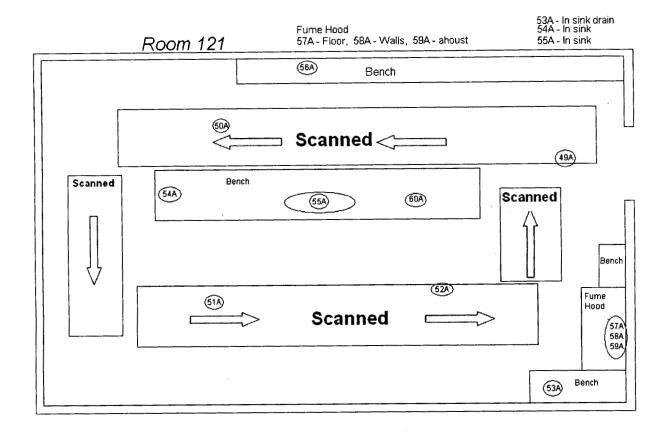


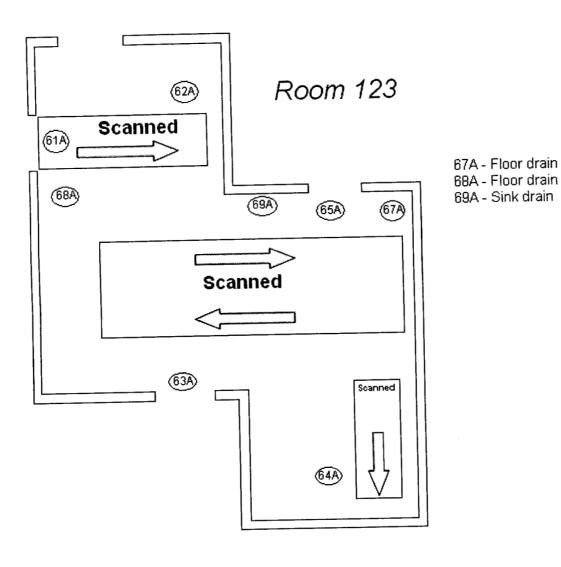
	3				Survey Requireme Beta	Gamr	ma		
Building/Area:	Room 121			Floor	20%				
Floor/Elevation:	Floor			Wall	·			1	
Survey Unit/Grid:	Non-Rad L	ab		Ceiling				1	
	8 inch tile		Actual s	urveyed	30%			1	
Survey Type:		cm ² probe							
Date/Time:	2/23/2007							•	
					<u>Instrume</u>	nt Informa	<u>tion</u>		
Floor Monitor I	ID Number:				MARSS Inst ID:				
Alpha/Beta Se	can Speed:	2.5 inches/s	sec		Logger Model:	2350-1		•	
Alpha/Beta So	•			Log	ger Serial Number:	149408		•	
Gamma Scan Speed:				_	-	10/22/2007		•	
Gamma So	can Height:				Detector Model:	43-37-1			
				Dete	tor Serial Number:	PR145081			
Background Infor	rmation								
Material	Bkgd Level	invest. Level	Alarm Level		Source Che	cks			
8 inch tile β Floor	618 cpm	1236 cpm				Date	Time	Initial	
III p	О то сріп	1200 cpiii			Prior	2/23/2007	921	bwb	
	 					2/23/2007	1630	bwb	
						4, 40, 40,		2.1.2	
	 			Note: Sour	e checks required at b	eginning and	end of shi	ft	
Comments:	an level see	n in this roor		pm					
Smears tal 49A throug		positive active	ity detected	4) clean-up					
Smears tal 49A throug No activity	gh 60A - No p	positive active ess of the R	vey map to	this docum	ent	Date	A14410007		
Smears tal 49A throug No activity	gh 60A - No p	positive active	vey map to	this docum		Date: _	4/11/2007		

Room 120B

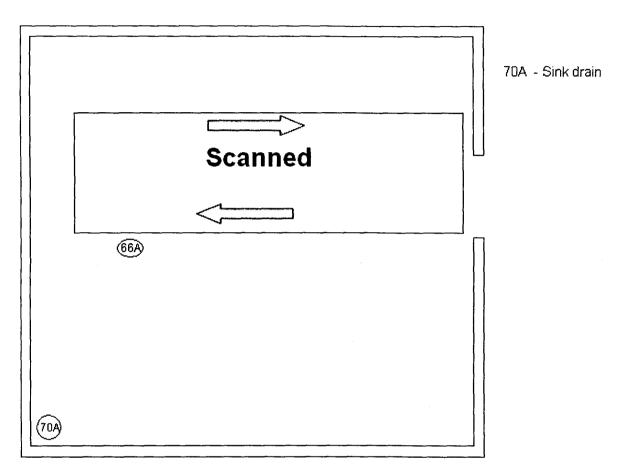


					Survey Requireme	ents		
Area Classification:	3				Beta	Gamn	na	Ì
Building/Area:	Rooms 123	, 123A and	123B	Floor	20%			1
Floor/Elevation:	Floor			Wall				1
Survey Unit/Grid:	Non-Rad La	ab/Darkroon	n/Office	Ceiling				
	8 inch tile		Actual s	urveyed	30%			
Survey Type:	β scan 771	cm ² probe						1
Date/Time:	2/23/2007							
					<u>Instrume</u>	nt Informat	ion	
Floor Monitor II	D Number:				MARSS Inst ID:			
Alpha/Beta So	an Speed:	2.5 inches/s	sec		Logger Model:	2350-1		1
Alpha/Beta Sc	an Height:	1/2 inch		Lo	ogger Serial Number:	149408		
Gamma So	an Speed:				Cal Due Date:	10/22/2007		1
Gamma Sc	an Height:				Detector Model:	43-37-1		
				Det	ector Serial Number:	PR145081		
Background Infor	<u>mation</u>							
Material	Bkgd Level	invest. Levei	Alarm Level		Source Che	cks		
8 inch tile β Floor				l		D-4-	71	1-141.1.
o inch the p Floor	618 cpm	1236 cpm			Drien	Date 2/23/2007	Time	Initials
							925 1635	bwb
					Enu:	2/23/2007	1635	bwb
				Noto: Sou	arce checks required at t	noginaing and	and of ahif	
				Note. 300	arce checks required at t	beginning and	end of Silli	
Comments:		n in this coo	- was 665 a					ļ
•		n in this roor		pm:				1
		ap for locat		. No positi	ve activity detected			
			-	•	ositive activity detected			
					ve activity detected			
		•	•	•	ositive activity detected			1
				•	nd 70A - No positive acti	hetacted wivi		
SHIK DIAIH	sinears non	11001115 123	anu izsa	were oan a	nd roA - No positive act	ivity detected		
No activity	found in exc	ess of the R	RG 1.86 (19	74) clean-u	p guidelines			
		Attach sur	vey map to	this docu	ment			
Technicia	n/Surveyor:	Byron Blan	d		Pyran Charl	Date:	4/11/2007	
,	- ,	Name			Signature			
-				C	and as m			ł
Superviso	r/Reviewer:	Joseph W.	Moon, CHP			Date:	4/11/2007	
		Name			Signature	-		1
		·						



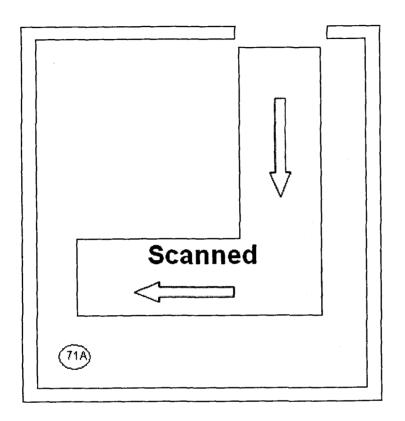


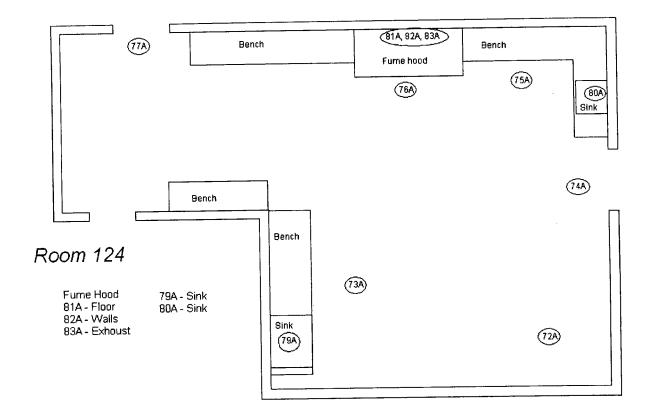
Room 123A



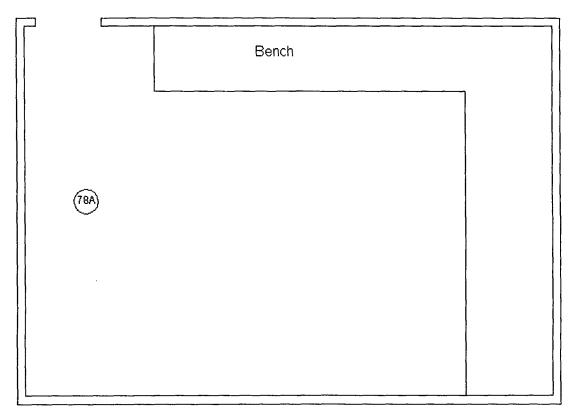
						Survey F	Requireme	nts		
Area Clas	sification:	1				В	eta	Gam	ma	
Buil	ding/Area:	Rooms 124	& 124A		Floor	10	00%	as req	uired	
Floor	/Elevation:	Rad Lab ar	d Office		Wall					
Survey	Unit/Grid:			Working	Surfaces	10	00%	100)%	
	Surface:	8 inch tile		Actual s	urveyed	10	00%	100)%	
Su	rvey Type:	β scan 771	cm² probe			Ĺ <u>. </u>				
		β scan 126	cm² probe							
		γ scan μR ι					Instrumer	<u>it Informat</u>	ion	
	Date/Time:	2/23/2007a	nd 3/22/200	7						
}							β Floor	β hand held	γ μR meter	
				Floo	r Monitor I			2	Ludlum	
ì	•	2.5 inches/s	sec			er Model:	2350-1	2350-1		
1	an Height:			Lo	gger Seria		149408	149408		
	Scan Speed:				Due Date:	10/22/2007	10/22/2007			
γSc	Scan Height: 1/2 inch				or Model:	43-37-1	43-68	Model 19		
ļ		D -1			ector Seria	l Number:	PR145081	PR148454	182679	
ł		Backgro	<u>und Infor</u>	<u>mation</u>						
			Bkgd	invest.	Alarm					
\	Material		Level	Level	Level	<u>s</u>	ource Che	<u>cks</u>		
!	8 inc	h tile	618 cpm	1236 cpm		1		Date	Time	Initials
		h β Hand	239 cpm	478 cpm		β Floor	Prior:	2/23/2007	921	bwb
		posure rate		30 µR/hr	 -	1	End:		1630	bwb
	F		<u> </u>	00 2. 07.11	·	β hand		3/22/2007	905	bwb
('						1 1		3/22/2007	1315	bwb
1					Note: Sour	ce checks r	equired at bed			5112
Commen	ıts:						. ,	, ,		
		or monitor s	can level se	en in this ro	om was 754	4 cpm				
	•	nd held scar				•				
	Highest µR	meter mea	surement se	en in this ro	oom was ba	ckground				
	Smears tal	ken - see m	nap for locat	ion						
}	Floor smea	ars in Room	124 72A thr	ough 77A -	No positive	activity dete	ected			
	Sink drains	in Room 12	24 79A and	80A - No po	sitive activit	y detected				
	Floor smea	ar in Room 1	24A - 78A -	No positive	activity det	ected				
1	Fume hood	d smears in l	Room 124 -	80A - 83A -	No positive	activity det	ected			
	No activity	found in exc	ess of the F	RG 1.86 (19	74) clean-uı	o guidelines				
ļ										
l		,								
			Attach sur	vey map to	this docu	ment				
							·			
						1000	I towns			
1	Technicia	in/Surveyor:		ıd				Date:	4/11/2007	
			Name			Signature				
					مر الم	enof a	177		4/44/222	
1	Superviso	or/Reviewer:		Moon, CHF		<u></u>		Date:	4/11/2007	
1			Name			Signature				
L										

Room 123B



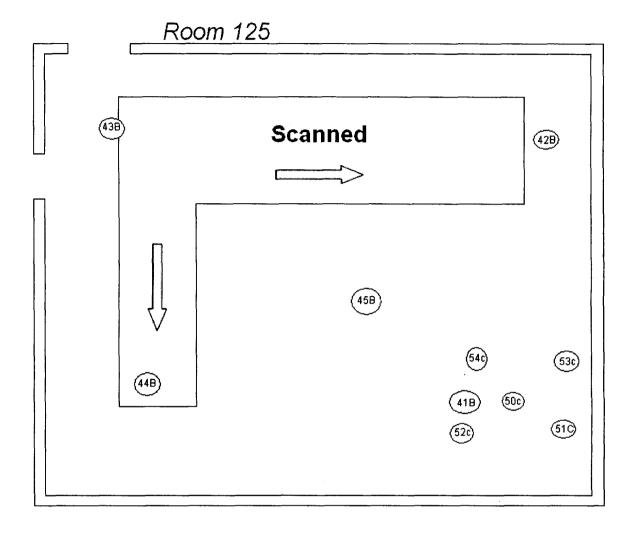


Room 124A

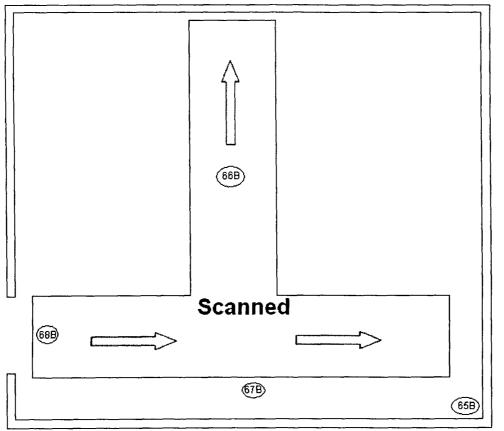


100% scan of accessible floor area

					Survey Requireme			
Area Classification:	3			(Beta	Gamn	na	ı
Building/Area:	Room 125			Floor	20%			
Floor/Elevation:	Floor			Wall				
Survey Unit/Grid:	Office			Ceiling				
	8 inch tile		Actua	il surveyed	30%			
Survey Type:		cm² probe						
Date/Time:	2/23/2007							
					Instrume	nt Informat	<u>lion</u>	
Floor Monitor II	D Number:				MARSS Inst ID:			
Alpha/Beta So		2.5 inches/s	sec	•	Logger Model:	2350-1		1
Alpha/Beta Sc				Lo	ogger Serial Number:	149408		-
•	an Speed:			•	Cal Due Date:	10/22/2007		•
Gamma So	an Height:				Detector Model:	43-37-1		
				Det	ector Serial Number:	PR145081		_
Background Infor	<u>mation</u>							
	Dienel	Imrost	Alarm					
Material	Bkgd Level	Invest. Level	Alarm Level		Source Che	cks		·
8 inch tile	618 cpm	1236 cpm		1		Date	Time	Initials
OHIOTHIG	O TO CPTIS	1200 cp.ii.		1	Prior:	2/23/2007	925	bwb
				1		2/23/2007	1635	bwb
				1				
				Note: Sou	urce checks required at t	peginning and	end of shift	ft
1	an level seer			cpm				
I .	ken - see m	•						
	•	-			rain - No positive activity	detected exc	ept	
,	lpm/100cm2							
Investigation	nal survey 5	OC through	. 54C - No p	ositive activ	vity detected			
No activity	found in exc	ess of the R	रेG 1.86 (19	974) clean-u	p guidelines			
		Attach sur	vey map to	o this docu	ment			
Technicia	an/Surveyor:	Byron Blan	nd		Signature	Date:	4/11/2007	_
		Name			Signature			
					and a man	. .	44440007	
Superviso	or/Reviewer:					Date:	4/11/2007	-
		Name			Signature			

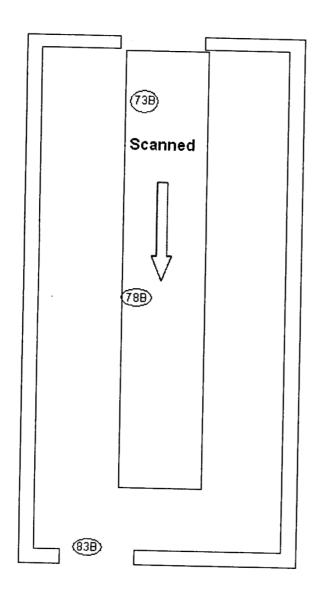


1								' 1
					C	4		
					Survey Requireme			
Area Classification:	3			1	Beta	Gamr	na	1
Building/Area:				Floor	20%			1
Floor/Elevation:				Wall				
Survey Unit/Grid:				Ceiling				
Surface:		concrete	Actua	l surveyed	35%			i
Survey Type:	β scan 771	cm² probe						<u>l</u>
Date/Time:	2/23/2007							
					<u>Instrume</u>	<u>nt Informa</u>	<u>tion</u>	
Floor Monitor I	D Number:				MARSS Inst ID:			-
Alpha/Beta Se	can Speed:	2.5 inches/se	эс	•	Logger Model:	2350-1		_
Alpha/Beta So				Lo	gger Serial Number:	149408		_
Gamma So	can Speed:			•	Cal Due Date:	10/22/2007		_
Gamma So	an Height:		_	•	Detector Model:	43-37-1		•
	•			Dete	ector Serial Number:	PR145081		•
Background Infor	mation	,			•			•
	Bkgd	Invest.	Alarm			. •		
Material	Level	Level	Level		Source Che	CKS		
sealed concrete	929 cpm	1.86k cpm		1		Date	Time	Initials
				1	Prior:	2/23/2007	925	bwb
				1	End:	2/23/2007	1635	bwb
				i				
				Note: Sou	rce checks required at I	peginning and	end of shi	ft
		· · · · · · · · ·	<u> </u>	1	•	0		
Comments:								
1	an level see	n in this room	was 950 c	nm				
1		nap for location		Pili				
1		66B on floor		nocitivo acti	uity detected			
1		ositive activi		positive acti	vity detected			
ODD IN SHIP	curain - No j	oosilive activi	iy delected					
1								
		=						
No activity	found in exc	ess of the R	G 1.86 (197	4) clean-up	guidelines			
j								
		Attach surv	ey map to	this docum	ent			
}					Paymen Claret			
Technicia	an/Surveyor:	Byron Bland	<u>d</u>			Date:	4/11/2007	,
		Name	•		Signature			
1				معترض المستحدث	ab W 12_			
Superviso	or/Reviewer:	Joseph W. I	Moon, CHP		11 157	Date:	4/11/2007	<u> </u>
1		Name			Signature			
1								

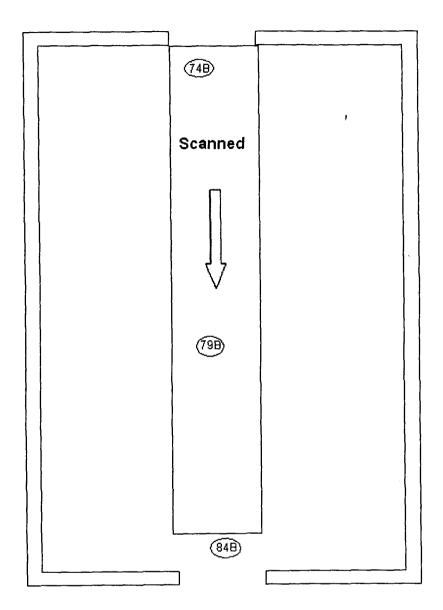


65B - In sink

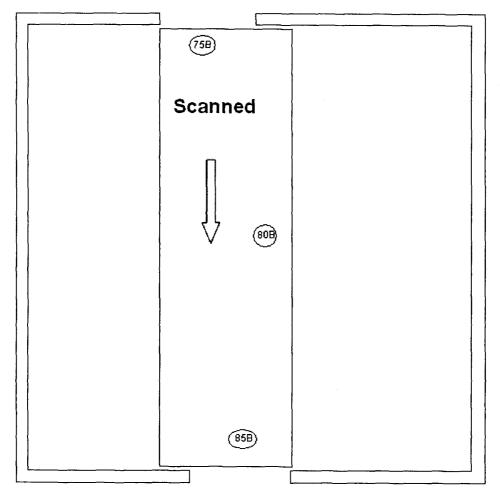
				S	Survey Requireme			
Area Classification:					Beta	Gamn	na	1
Building/Area:				Floor	20%			
Floor/Elevation:	Floor			Wall				
Survey Unit/Grid:				Ceiling	000/			
Surface:			Actua	l surveyed_	30%			Ì
Survey Type:		cm ² probe		L				j .
Date/Time:	2/23/2007				instrume	nt Informat	tion	
								
Floor Monitor I	D Number:				MARSS Inst ID:			_
Alpha/Beta S	can Speed:	2.5 inches/s	ес	•	Logger Model:	2350-1		_
Alpha/Beta So				Log:	ger Serial Number:	149408		-
Gamma Se	can Speed:			•	Cal Due Date:	10/22/2007		
Gamma So	can Height:			•	Detector Model:	43-37-1		_
	-			Detec	tor Serial Number:	PR145081		_
Background Infor	mation				•			_
Material	Bkgd Level	Invest. Level	Alarm Level	_	Source Che	cks		
sealed concrete	929 cpm	1.86k cpm		1		Date	Time	Initials
]	Prior:	2/23/2007	925	bwb
	1				End:	2/23/2007	1635	bwb
					End:	2/23/2007	1635	bwb
				Note: Source	End: ce checks required at t			
				Note: Sourc				
Comments:				Note: Sourc				
	an level see	n in this roon	m was 840 d	•				
Highest sc	an level see ken - see n			•				
Highest sc Smears tal	ken - see n	nap for locati	ion	•	ce checks required at l			
Highest sc Smears tal	ken - see n	nap for locati	ion	cpm	ce checks required at l			
Highest sc Smears tal	ken - see n	nap for locati	ion	cpm	ce checks required at l			
Highest sc Smears tal	ken - see n	nap for locati	ion	cpm	ce checks required at l			
Highest sc Smears tal	ken - see n	nap for locati	ion	cpm	ce checks required at l			
Highest sc Smears tal	ken - see n	nap for locati	ion	cpm	ce checks required at l			
Highest sc Smears tal 73B & 78B	ken - see n	nap for locati i 83B on floc	ion or drain- No	cpm	ce checks required at l			
Highest sc Smears tal 73B & 78B	ken - see n	nap for locati i 83B on floc	ion or drain- No	cpm positive activi	ce checks required at l			
Highest sc Smears tal 73B & 78B	ken - see n	nap for locati i 83B on floc	ion or drain- No	cpm positive activi	ce checks required at l			
Highest sc Smears tal 73B & 78B	ken - see n	nap for locati i 83B on floo cess of the R	ion or drain- No G 1.86 (19)	cpm positive activi 74) clean-up ç	ce checks required at t			
Highest sc Smears tal 73B & 78B	ken - see n	nap for locati i 83B on floo cess of the R	ion or drain- No G 1.86 (19)	cpm positive activi	ce checks required at t			
Highest sc Smears tal 73B & 78B No activity	ken - see n	nap for locati i 83B on floo eess of the R	on or drain- No ag 1.86 (19) vey map to	positive activity 74) clean-up c	ce checks required at hit ity detected guidelines	peginning and	end of shi	ft
Highest sc Smears tal 73B & 78B No activity	ken - see n	nap for locati i 83B on floo cess of the R Attach sur	ion or drain- No ag 1.86 (19) vey map to	positive activity 74) clean-up c	ce checks required at hit ity detected guidelines	peginning and		ft
Highest sc Smears tal 73B & 78B No activity	ken - see n	nap for locati i 83B on floo eess of the R	ion or drain- No ag 1.86 (19) vey map to	positive activity positive activity act	ity detected guidelines ent Signature	peginning and	end of shi	ft
Highest sc Smears tal 73B & 78B No activity	ken - see no on floor and found in exc an/Surveyor:	nap for locati i 83B on floo cess of the R Attach sur	on or drain- No aG 1.86 (19) wey map to	positive activity	ity detected guidelines ent Signature	Date:	end of shi	ft
Highest sc Smears tal 73B & 78B No activity	ken - see n	nap for locati i 83B on floo cess of the R Attach sur	on or drain- No or	positive activi	ce checks required at hit ity detected guidelines	Date:	end of shi	ft



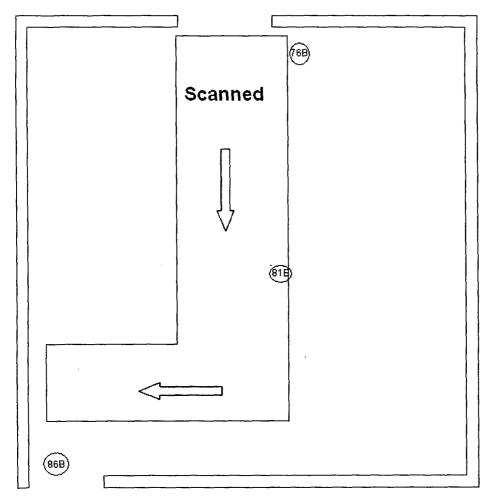
				Survey Requirement	us		
Area Classification:	3			Beta	Gamm	a	
Building/Area:	Room 130			Floor 20%			
Floor/Elevation:				Wall			
Survey Unit/Grid:				Ceiling			
Surface:	sealed o	oncrete	Actual s	urveyed 25%			
Survey Type:	β scan 771	cm² probe					
Date/Time:							
				<u>Instrume</u>	nt Informat	<u>ion</u>	
				MARCC Inch IO			
Floor Monitor I				MARSS Inst ID:	2350-1		
Alpha/Beta So			ec	Logger Model: _ Logger Serial Number:	149408		
Alpha/Beta So					10/22/2007		
	an Speed:			Detector Model:	43-37-1		
Gamma So	an Height:			Detector Serial Number:			
	matica			Defector Deligi Hamber.			
Background Infor	mation						
	Bkgd	invest. Level	Alarm Level	Source Che	cks		
Material	Level		Levei		Date	Time	Initials
sealed concrete	929 cpm	1.86k cpm		Prior:	2/23/2007	925	bwb
					2/23/2007	1635	bwb
	 	<u> </u>			2,20,200		
	 			Note: Source checks required at I	peginning and	end of shi	ft
	L	l		,	-		
Comments:							
	an level see	n in this roon	n was 921 cp	om			
		nap for locati					
	on floor and	d 84B on floo	r drain- No p	ositive activity detected			
74B & 79E							
74B & 79E							
74B & 79E							
74B & 79E							
74B & 79E							
		cess of the R	SG 1.86 (1974	4) clean-up guidelines			
		cess of the R	kG 1.86 (1974	4) clean-up guidelines			
		cess of the R	3G 1.86 (1974	4) clean-up guidelines			
				4) clean-up guidelines this document			
				this document			
No activity	/ found in ex		vey map to 1	this document	Date:	4/11/2007	
No activity	/ found in ex	Attach sur	vey map to t	this document	Date:	4/11/2007	, <u> </u>
No activity Technic	ofound in ex	Attach sur	vey map to t	this document // y con f k and Signature	-		_
No activity Technic	ofound in ex	Attach sur	vey map to t	this document	-	4/11/2007	_



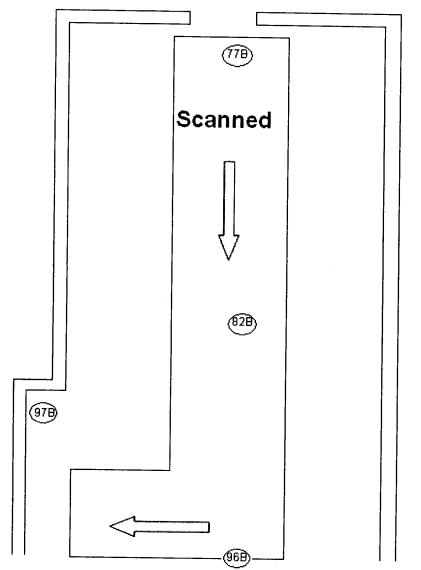
					Survey Requireme	ents		
Area Classification:	3				Beta	Gamı	ma	
Building/Area:	Room 131			Floor	20%			
Floor/Elevation:				Wall				
Survey Unit/Grid:				Ceiling				
Surface:	sealed o	concrete	Actual	surveyed	30%			
Survey Type:	β scan 771	cm ² probe						
Date/Time:				•				
Floor Monitor I	D Number:				Instrume	nt Informa	<u>tion</u>	
Alpha/Beta S	can Speed:	2.5 inches/s	ес	Logger Model:		2350-1		
Alpha/Beta So	an Height:	1/2 inch		Lo	gger Serial Number:	149408		
Gamma S	can Speed:				Cal Due Date:	10/22/2007		
Gamma Se	Gamma Scan Height:				Detector Model:	43-37-1		
				Dete	ector Serial Number:	PR145081		
Background Infor	<u>mation</u>							
Material	Bkgd Level	invest. Level	Alarm Levei		Source Che	cks		
sealed concrete	929 cpm	1.86k cpm				Date	Time	Initials
	<u> </u>				Prior:	2/23/2007	925	bwb
					End:	2/23/2007	1635	bwb
				Note: Sou	rce checks required at t	peginning and	end of shift	t
Smears tal 75B & 80B	ken - see n on floor and	n in this roon nap for locati il 85B on floo	on or drain- No (positive acti	vity detected			
No activity	touna in exc	cess of the K	G 1.86 (197	4) clean-up	guidelines			
		Attach sur	vey map to	this docum	nent			· · · · · · · · · · · · · · · · · · ·
Technicia	an/Surveyor:	Byron Blan Name	d		Signature	Date:	4/11/2007	
Superviso	or/Reviewer:	Joseph W.	Moon, CHP	57.	egof a Mong	Date:	4/11/2007	
		Name			Signature			



Area Classification:				_	n .	4		
				S	urvey Requireme	nts Gamn		
Charles 12				Floor	20%	Gamil	"	
Building/Area:				Wall	20%			
Floor/Elevation:				Ceiling				
Survey Unit/Grid:		oncrete	Actus	l surveyed	30%		——-	
Surface: Survey Type:			Actua	" surveyed	3070			
	2/23/2007	cm probe		L.				
5410 / 1					Instrume	nt Informat	<u>ion</u>	
Floor Monitor	ID Number:				MARSS Inst ID:			
Alpha/Beta S		2.5 inches/se	ec	-	Logger Model:	2350-1		
Alpha/Beta S				Log	ger Serial Number:	149408		
•	can Speed:				Cal Due Date:	10/22/2007		
	can Height:			•	Detector Model:	43-37-1		
				Detec		PR145081		
Background Info	rmation							
<u>Jagitgi Garia III. e.</u>								
Material	Bkgd Level	invest. Level	Alarm Level		Source Che	cks		
sealed concrete	929 cpm	1.86k cpm		1		Date	Time	Initials
	 			1	Prior:	2/23/2007	925	bwb
				1	End:	2/23/2007	1635	bwb
	1			İ				
				Note: Source	e checks required at t	eginning and	end of shif	t
Smears ta	can level see lken - see n 3 on floor and	nap for location	on	cpm positive activi	ty detected			
No activity	found in exc	ess of the R	G 1.86 (19)	74) clean-up g	uidelines			
No activity	rfound in exc		`	74) clean-up g	nt			
	····	Attach surv	vey map to	, , ,		Date:	4/11/2007	
	n found in exc	Attach surv	vey map to	this docume	int Sycal is the great	Date:	4/11/2007	
	····	Attach surv	vey map to	this docume	ent Signature	Date: _	4/11/2007	
Technici	an/Surveyor:	Attach surv Byron Bland Name	vey map to	this docume	int Sycal is the great	. <u>-</u>		
Technici	····	Attach surv Byron Bland Name	vey map to	this docume	ent Signature	. <u>-</u>	4/11/2007 4/11/2007	

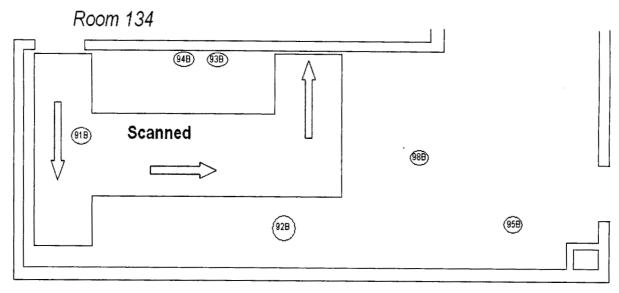


				S	urvey Requireme	nts		
A Classification:	3			•	Beta	Gamm	ia .	
Area Classification:				Floor	20%			
Building/Area:				Wall	2070			
Floor/Elevation:	Floor			Ceiling				
Survey Unit/Grid:		anarata	Actus	al surveyed	40%		/	
Surface:			Actua	II Sulveyed	4070			
Survey Type:		cm ⁻ probe_		<u> </u>				
Date/Time:	2/23/2007							
					Instrume	nt Informat	<u>ion</u>	
Floor Monitor I	n Number				MARSS Inst ID:			
Alpha/Beta So		2.5 inches/se			Logger Model:	2350-1		
Alpha/Beta So				Loge	ger Serial Number:	149408		
•	an Speed:			0.	Cal Due Date:	10/22/2007		
	an Speed. an Height:				Detector Model:	43-37-1		
Gamina Sc	an neight.			Detec	tor Serial Number:	PR145081		
Background Infor	mation				-			
Material	Bkgd Level	invest. Level	Alarm Level		Source Che	cks		
sealed concrete	929 cpm	1.86k cpm				Date	Time	Initial
				1	Prior:	2/23/2007	925	bwb
					1 11011			
						2/23/2007	1635	bwb
						2/23/2007	1635	bwb
				Note: Sourc				
Comments:				•	End:			
Highest so		n in this room		•	End:			
Highest so Smears ta	ken - see r	nap for locati	on	pm	End:			
Highest so Smears ta 77B, 82B,	ken - see r & 96B on flo	nap for locati oor - No positi	on ive activity (opm detected	End:			
Highest so Smears ta 77B, 82B,	ken - see r & 96B on flo	nap for locati	on ive activity (opm detected	End:			
Highest so Smears ta 77B, 82B,	ken - see r & 96B on flo	nap for locati oor - No positi	on ive activity (opm detected	End:			
Highest so Smears ta 77B, 82B,	ken - see r & 96B on flo	nap for locati oor - No positi	on ive activity (opm detected	End:			
Highest so Smears ta 77B, 82B,	ken - see r & 96B on flo	nap for locati oor - No positi	on ive activity (opm detected	End:			
Highest so Smears ta 77B, 82B, 97B on the	ken - see r & 96B on flo sink dráin	nap for locati oor - No positi - No positive	on ive activity o activity det	opm detected ected	End: ce checks required at b			
Highest so Smears ta 77B, 82B, 97B on the	ken - see r & 96B on flo sink dráin	nap for locati oor - No positi - No positive	on ive activity o activity det	opm detected	End: ce checks required at b			
Highest so Smears ta 77B, 82B, 97B on the	ken - see r & 96B on flo sink dráin	nap for locati oor - No positi - No positive	on ive activity o activity det	opm detected ected	End: ce checks required at b			
Highest so Smears ta 77B, 82B, 97B on the	ken - see r & 96B on flo sink dráin	nap for location - No positive - No positive	on ive activity det activity det	opm detected ected	End: ce checks required at t			
Highest so Smears ta 77B, 82B, 97B on the	ken - see r & 96B on flo sink dráin	nap for location - No positive - No positive	on ive activity det activity det	opm detected ected 74) clean-up o	End: ce checks required at b guidelines	peginning and		
Highest so Smears ta 77B, 82B, 97B on the No activity	ken - see r & 96B on flo e sink dräin	nap for location - No positive - No positive cess of the R	on ive activity det activity det cG 1.86 (19) vey map to	opm detected ected 74) clean-up o	End: ce checks required at t	peginning and		ft
Highest so Smears ta 77B, 82B, 97B on the No activity	ken - see r & 96B on flo e sink dräin	nap for location - No positive - No positive cess of the R Attach sur	on ive activity det activity det c 1.86 (19) vey map to	opm detected ected 74) clean-up o	End: ce checks required at the checks requir	peginning and	end of shi	ft
Highest so Smears ta 77B, 82B, 97B on the No activity	ken - see r & 96B on flo e sink dräin	nap for location - No positive - No positive cess of the R	on ive activity det activity det c 1.86 (19) vey map to	opm detected ected 74) clean-up o	End: ce checks required at the second secon	peginning and	end of shi	ft
Highest so Smears ta 77B, 82B, 97B on the No activity	ken - see r & 96B on flo e sink drain r found in ex an/Surveyor	nap for location - No positive - No positive cess of the R Attach sur	on ive activity detection activi	cpm detected ected 74) clean-up c	End: ce checks required at the second secon	Date:	end of shi	ft



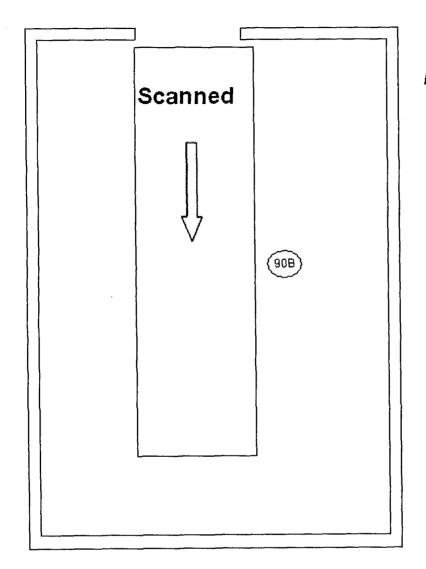
97B - In sink

					Survey Requireme	nts		
A 01	2				Beta	rics Gamn	na	
Area Classification:	3			Floor	20%		 -	
Building/Area:				Wall	2078			
Floor/Elevation:	Floor			Ceiling				
Survey Unit/Grid:	sealed o		Actual	surveyed	35%			
Surface:			Actual	Suiveyea	3370			ļ
Survey Type:		cm probe			<u> </u>			
Date/Time:	2/23/2007							
					Instrume	nt Informat	tion .	
Floor Monitor I	D Number:				MARSS Inst ID:			
Alpha/Beta So		2.5 inches/s	ec		Logger Model:	2350-1		
Alpha/Beta So				L	ogger Serial Number:	149408		
1	an Speed:				Cal Due Date:	10/22/2007		
1	an Height:		<u> </u>		Detector Model:	43-37-1		
				Def	ector Serial Number:	PR145081		
Background Infor	<u>mation</u>				•			
	Direct	.	Alarm					
Material	Bkgd Level	invest. Levei	Level		Source Che	cks		
sealed concrete	929 cpm	1.86k cpm				Date	Time	Initials
					Prior:	2/23/2007	925	bwb
					End:	2/23/2007	1635	bwb
				Note: So	urce checks required at I	peginning and	end of shi	ft
	<u> </u>			ı				
Comments:								
1		n in this roor		pm				
j .		nap for locati						
		- No positive			(A A1			
		IB on sink dr						
1	walk-in dec	on booth - N	io positive a	ctivity dete	ctea			
Comments:								
No activity	found in exc	cess of the R	RG 1.86 (197	'4) clean-u	p guidelines			
			- \ -	•				
1		A44	m 4-	thie door	ment			
		Aπach sur	vey map to	uns docu	ment	-		
Tankaisi	on/Curious	: Byron Blan	nd		Pyran Polaniel	Date:	4/11/2007	
recnnicia	an/Jourveyor.	Name			Signature	- 50.0.		-
		110,110		وسد بني	•			
Superviso	or/Reviewer	: Joseph W.	Moon, CHP	57	regard a Mong	Date:	4/11/2007	•
Capcivis		Name			Signature	•		-

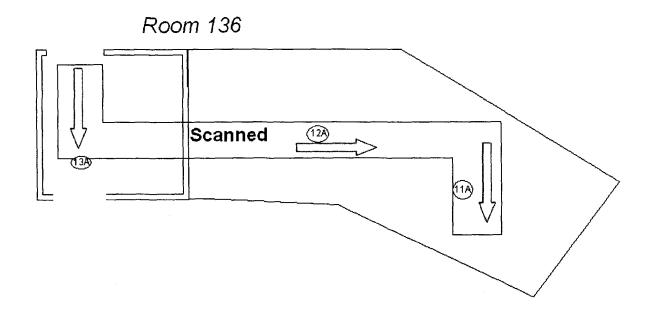


94B - In sink

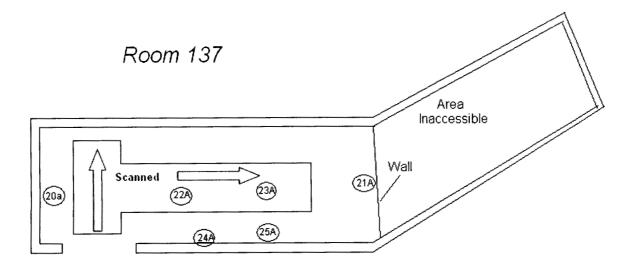
				;	Survey Requireme	ents		
Area Classification:	3				Beta	Gamr	na	
Building/Area:	135			Floor	20%			
Floor/Elevation:	Floor			Wall				
Survey Unit/Grid:				Ceiling				
Surface:		concrete	Actual	surveyed	35%			
Survey Type:		cm ² probe		1				Į
Date/Time:	2/23/2007							
					Instrume	nt Informa	<u>tion</u>	
Floor Monitor I	D Number:				MARSS Inst ID:			
Alpha/Beta So		2.5 inches/s	ec		Logger Model:	2350-1	***************************************	
Alpha/Beta So				Lo	gger Serial Number:	149408		
1	can Speed:				Cal Due Date:	10/22/2007		
Gamma So	an Height:				Detector Model:	43-37-1		
				Dete	ctor Serial Number:	PR145081		
Background Infor	mation							
	Bkgd	invest.	Alarm					
Material	Level	Level	Level		Source Che	cks		
sealed concrete	929 cpm	1.86k cpm				Date	Time	Initials
					Prior:	2/23/2007	925	bwb
					End:	2/23/2007	1635	bwb
				Note: Soul	ce checks required at b	eginning and	end of shift	t
Smears tal	ken - see m	n in this roon nap for locati ive activity de	on	срт				
Comments:								
No activity	found in exc	cess of the R	G 1.86 (197	4) clean-up	guidelines			
		Attach surv	ey map to	this docum	ent			
Technicia	n/Survevor:	Byron Bland	d		Paymen Plant	Date:	4/11/2007	
, 55	, 5	Name			Signature			
Superviso	or/Reviewer:	Joseph W. I	Moon, CHP	57-	af a Man	Date:	4/11/2007	
		Name			Signature			



					Survey Requireme	nts		
Area Classification:	3				Beta	Gamr	na	
Building/Area:				Floor	20%			
Floor/Elevation:				Wali				
Survey Unit/Grid:				Ceiling				
	8 inch tile		Actual s	urveyed	30%			
Survey Type:		cm² probe						
Date/Time:						_		
	-				Instrume	nt Informa	<u>tion</u>	
Floor Monitor I	D Number:				MARSS Inst ID:			
Alpha/Beta So		2.5 inches/s	sec		Logger Model:	2350-1		
Alpha/Beta Sc				Lo	ogger Serial Number:	149408		
	an Speed:				Cal Due Date:	10/22/2007		
Gamma So	an Height:				Detector Model:	43-37-1		
				Det	ector Serial Number:	PR145081		
Background Infor	<u>mation</u>							
	Bkgd	Invest.	Alarm					
Material	Level	Levei	Level		Source Che	cks		
8 inch tile β Floor	618 cpm	1236 cpm		l		Date	Time	Initials
<u> </u>				[Prior:	2/23/2007	925	bwb
]	End:	2/23/2007	1630	bwb
				ł				
				Note: So	urce checks required at b	eginning and	end of shift	t
Smears tal	an levelsee ken - see m h 13A - No p	nap for locat	ion	•				
No activity	found in exc		RG 1.86 (19 vey map to		p guidelines ment		······································	
Technicia	ın/Surveyor:	Byron Blar Name			Signature	Date:	4/11/2007	
Superviso	or/Reviewer:			و جري	upof a Mon	Date:	4/11/2007	
		Name			Signature			

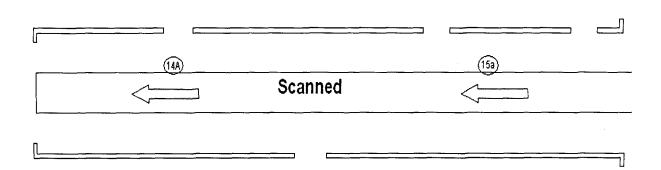


					Survey Requireme	ents		Ì
Area Classification:	3				Beta	Gamr	na	
Building/Area:	Room 137			Floor	20%			
Floor/Elevation:	Floor			Wall				
Survey Unit/Grid:	Rad Waste	processing		Ceiling				
Surface:	8 inch tile		Actual s	surveyed	20%			
Survey Type:	β scan 771	cm ² probe						
Date/Time:	2/22/2007				<u> </u>			
						nt Informat	tion	
Floor Monitor I				-	MARSS Inst ID:	0050.4		
Alpha/Beta So			sec		Logger Model:	2350-1		
Alpha/Beta So	-			- L	ogger Serial Number:	149408		
1	can Speed:			-	Cal Due Date:	10/22/2007		
Gamma So	an Height:			•	Detector Model:	43-37-1		
D. 1				Det	ector Serial Number:	PR145081		
Background Infor	mation							
Material	Bkgd Level	Invest. Level	Alarm Level		Source Che	cks		
8 inch tile β Floor	618 cpm	1236 cpm]		Date	Time	Initials
				1	Prior:	2/22/2007	1400	bwb
					End:	2/22/2007	1655	bwb
				Note: So	urce checks required at b	peginning and	end of shift	:
Smears tal Floor smear smear 24A smear 25A No positive Note: mate from this ro	ken - see mars 20A through ars 20A through a dipped in lice taken on 5 eractivity determinals marked born and dispense.	-6 crushed rected on sm d with radioa posed prior t	ion o positive a g in uncove noldy cardt ears 24A o ctive mater o demolitio	octivity detectored 30 gallo poard boxes r 25A rial labels sh rin of building	on Radwaste drum i marked for Rad waste u nould be removed g	ısage (presun	ned unused)
Technicia	n/Surveyor:	Byron Blan	od		Signature	Date:	4/11/2007	į
Superviso	or/Reviewer:	Joseph W.	Moon, CHF	, , , , , , , , , , , , , , , , , , , ,	enfam.	Date: _	4/11/2007	
		Name			Signature			



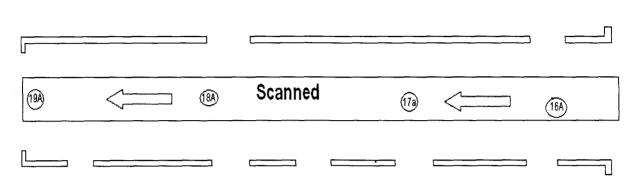
Prior: 2/22/2007 1400 bwb End: 2/22/2007 1655 bwb Note: Source checks required at beginning and end of shift Comments: Highest scan level seen in this room was 776 cpm Smears taken - see map for location 14A and 15A - No positive activity detected No activity found in excess of the RG 1.86 (1974) clean-up guidelines Attach survey map to this document Technician/Surveyor: Byron Bland Name Signature Supervisor/Reviewer: Joseph W. Moon, CHP Date: 4/11/2007	Beta Gamma					_				
Building/Area: Halt C-1 Floor Wall Survey Unificidit: Survey Unificidit: Survey Unificidit: Survey Unificidit: Survey Unificidit: Survey Unificidit: Survey Unificidit: Survey Type: ß scan 771 cm² probe Date/Time: 2/22/2007 Date/Time: 2/22/2007 Dat	Building/Area: Half C-1 Floor Wall Survey Unifedrit: Floor Wall Ceiling Survey Unifedrit: Actual surveyed 30% Survey Unifedrit: Survey Type: β scan 771 cm² probe Date/Time: 2/22/2007 Date/Time: 2/22/2007		_			:				
Floor/Elevation: Floor Survey Unit/Grid: Ceiling Survey Type: Sican 771 cm² probe Date/Time: 2/22/2007	Floor Floor Floor Survey Unit/Grid: Survey Unit/Grid: Survey Type: β scan 771 cm² probe Date/Time: 2/22/2007				i	г		Gamı	ma	
Survey Unit/Grid: Surface: 8 inch tile Survey Type: β scan 771 cm² probe Date/Time: 2/22/2007 Instrument Information	Survey Unit/Grid: Survey Unit/Grid: Survey Type: β scan 771 cm² probe Date/Time: 2/22/2007 Instrument Information	•					20%			
Surface: 8 inch tile Survey Type: β scan 771 cm² probe Date/Time: 2/22/2007 Instrument Information	Surva Type: β scan 771 cm² probe Date/Time: 2/22/2007 Instrument Information Date Dat		Floor							
Survey Type: \$\frac{\text{B} \text{ scan 771 cm}^2 \text{ probe}}{\text{Date/Time: } \frac{272272007}{\text{ lost Monitor ID Number: } \frac{\text{ lost MARSS Inst ID: }}{\text{ Logger Model: } \frac{250-1}{\text{ 149408}}}\$ Alpha/Beta Scan Height: \$\frac{120 \text{ inches/sec}}{\text{ Cal Due Date: } \frac{10/22/2007}{\text{ logger Serial Number: } \frac{149408}{\text{ 149408}}\$ Gamma Scan Speed: \$\text{ Cal Due Date: } \frac{10/22/2007}{\text{ Date: } \frac{10/22/2007}{\text{ logger Model: } \frac{23-1}{\text{ 149408}}}\$ Background Information Bigg	Survey Type: B scan 771 cm² probe Date/Time: 2/22/2007 Instrument Information	•				* ⊢				
Instrument Information Instrument Information	Instrument Information Instrument Information				Actuals	surveyed	30%			
Floor Monitor ID Number: Alpha/Beta Scan Speed: 2.5 inches/sec Logger Model: 2350-1 Logger Model: 149408 Gamma Scan Speed: 2.5 inches/sec Logger Serial Number: 149408 Gamma Scan Height: 1/2 inch Detector Model: 43-37-1 Detector Model: 43-37-1 Detector Serial Number: PR145081 PR145081	Floor Monitor ID Number: Alpha/Beta Scan Speed: 2.5 inches/sec Logger Model: 2350-1 Logger Model: 149408 Logger Serial Number: 149408 Logger Serial Number: 149408 Logger Serial Number: 149408 Logger Serial Number: 149408 Logger Serial Number: 149408 Logger Serial Number: 149408 Logger Serial Number: 149408 Logger Serial Number: 149408 Logger Serial Number: 149408 Logger Serial Number: 149408 Logger Serial Number: 198408 Logger Ser			cm2 probe		L				
Floor Monitor ID Number: Alpha/Beta Scan Speed: 2.5 inches/sec Alpha/Beta Scan Height: 1/2 inch Gamma Scan Speed: Cal Due Date: 10/22/2007 Background Information Bix Invest. Level Level Level Serial Number: PR145081 Binch tille β Floor 618 cpm 1236 cpm 1 Note: Source Checks Binch tille β Floor 618 cpm 1236 cpm 1 Note: Source checks required at beginning and end of shift Comments: Highest scan level seen in this room was 776 cpm Smears taken - see map for location 14A and 15A - No positive activity detected Attach survey map to this document Technician/Surveyor: Byron Bland Name Signature Supervisor/Reviewer: Joseph W. Moon, CHP Name Signature Attach 350-1 149408 Logger Serial Number: 10/22/2007 Logger Serial Number: 10/22/2007 Logger Serial Number: 10/22/2007 Logger Serial Number: 10/22/2007 Logger Serial Number: 10/22/2007 Date: 4/11/2007	Floor Monitor ID Number: Alpha/Beta Scan Speed: 2.5 inches/sec Alpha/Beta Scan Height: 1/2 inch Gamma Scan Speed: Cal Due Date: 10/2/2/2007 Gamma Scan Height: Detector Model: 43-37-1 Detector Serial Number: PR145081 Background Information Bakgd Invest. Alarm Level Level Level Source Checks 8 inch tille β Floor 618 cpm 1236 cpm Prior: 2/22/2007 1400 bwb End: 2/22/2007 1655 bwb Note: Source checks required at beginning and end of shift Comments: Highest scan level seen in this room was 776 cpm Smears taken - see map for location 14A and 15A - No positive activity detected Attach survey map to this document Technician/Surveyor: Byron Bland Name Signature Supervisor/Reviewer: Joseph W. Moon, CHP Date: 4/11/2007	Date/Time:	2/22/2007		•					
Alpha/Beta Scan Speed: 2.5 inches/sec Logger Model: 149408 14	Alpha/Beta Scan Speed: 2.5 inches/sec						<u>Instrume</u>	nt Informa	<u>tion</u>	
Alpha/Beta Scan Height: 1/2 inch Gamma Scan Speed: Gamma Scan Height: Detector Model: A3-37-1 Detector Serial Number: Detector Model: A3-37-1 Detector Serial Number: Detector Serial Number: Detector Model: A3-37-1 Detector Serial Number: Detector Model: A3-37-1 Detector Serial Number: Detector Model: A3-37-1 Detector Model: A1-43-08-1 Detector Model: A4-3-7-1 Detector Model: A1-4-508-1 Detector Model: A1	Alpha/Beta Scan Height: 1/2 inch Gamma Scan Speed: Gamma Scan Height: Detector Model: A3-37-1 Detector Serial Number: PR145081 Bigd Level Level Level Binch tile β Floor 618 cpm 1236 cpm Note: Source Checks Find: 2/22/2007 1400 bwb End: 2/22/2007 1655 bwt Note: Source checks required at beginning and end of shift Comments: Highest scan level seen in this room was 776 cpm Smears taken - see map for location 14A and 15A - No positive activity detected Attach survey map to this document Technician/Surveyor: Byron Bland Name Signature Supervisor/Reviewer: Joseph W. Moon, CHP Detector Serial Number: 149-408 10/22/2007 Detector Model: 43-37-1 Detector Serial Number: PR145081 B 10/22/2007 Detector Model: 43-37-1 Detector Serial Number: PR145081 Background Information Source Checks Source Checks Pate Time Initial Prior: 2/22/2007 1400 bwb End: 2/22/2007 1655 bwt Note: Source checks required at beginning and end of shift Comments: Highest scan level seen in this room was 776 cpm Smears taken - see map for location 14A and 15A - No positive activity detected No activity found in excess of the RG 1.86 (1974) clean-up guidelines Attach survey map to this document Date: 4/11/2007	Floor Monitor I	D Number:				MARSS Inst ID:			
Alpha/Beta Scan Height: 1/2 inch Gamma Scan Speed: Gamma Scan Height: Detector Model: A3-37-1 Detector Serial Number: PR145081 Background Information Material Bkgd Level Level Level Source Checks 3 inch tile β Floor 618 cpm 1236 cpm Prior: 2/22/2007 1400 bwb End: 2/22/2007 1655 bwb Note: Source checks required at beginning and end of shift Comments: Highest scan level seen in this room was 776 cpm Smears taken - see map for location 14A and 15A - No positive activity detected Attach survey map to this document Technician/Surveyor: Byron Bland Name Signature Supervisor/Reviewer: Joseph W. Moon, CHP Logger Serial Number: 149408 Ada 19408 10/22/2007 143-37-1 PR145081 PR145081 PR145081 PR145081 PR145081 PR145081 PR145081 PR145081 PR145081 PR145081 PR145081 Prior: 2/22/2007 1400 bwb End: 2/22/2007 1655 bwb Note: Source checks required at beginning and end of shift Comments: Highest scan level seen in this room was 776 cpm Smears taken - see map for location 14A and 15A - No positive activity detected No activity found in excess of the RG 1.86 (1974) clean-up guidelines Attach survey map to this document Date: 4/11/2007	Alpha/Beta Scan Height: 1/2 inch Gamma Scan Speed: Gamma Scan Height: Detector Model: A3-37-1 Detector Serial Number: PR145081 Bigd Level Level Level Binch tile β Floor 618 cpm 1236 cpm Note: Source Checks Find: 2/22/2007 1400 bwb End: 2/22/2007 1655 bwt Note: Source checks required at beginning and end of shift Comments: Highest scan level seen in this room was 776 cpm Smears taken - see map for location 14A and 15A - No positive activity detected Attach survey map to this document Technician/Surveyor: Byron Bland Name Signature Supervisor/Reviewer: Joseph W. Moon, CHP Detector Serial Number: 149-408 10/22/2007 Detector Model: 43-37-1 Detector Serial Number: PR145081 B 10/22/2007 Detector Model: 43-37-1 Detector Serial Number: PR145081 Background Information Source Checks Source Checks Pate Time Initial Prior: 2/22/2007 1400 bwb End: 2/22/2007 1655 bwt Note: Source checks required at beginning and end of shift Comments: Highest scan level seen in this room was 776 cpm Smears taken - see map for location 14A and 15A - No positive activity detected No activity found in excess of the RG 1.86 (1974) clean-up guidelines Attach survey map to this document Date: 4/11/2007	Alpha/Beta So	can Speed:	2.5 inches/s	sec	_	Logger Model:	2350-1		
Gamma Scan Speed: Gamma Scan Height: Detector Model: 43-37-1 Detector Serial Number: Bixgd Invest. Alarm Level Level Level Source Checks 8 inch tile β Floor 618 cpm 1236 cpm Prior: 2/22/2007 1400 bwb End: 2/22/2007 1655 bwb Note: Source checks required at beginning and end of shift Comments: Highest scan level seen in this room was 776 cpm Smears taken - see map for location 14A and 15A - No positive activity detected Attach survey map to this document Technician/Surveyor: Byron Bland Name Signature Supervisor/Reviewer: Joseph W. Moon, CHP Date: 4/11/2007	Gamma Scan Speed: Gamma Scan Height: Detector Model: 43-37-1 PR145081 Bkgd Invest. Alarm Level Level Level Source Checks 8 inch tile β Floor 618 cpm 1236 cpm Prior: 2/22/2007 1400 bwb End: 2/22/2007 1655 bwb Note: Source checks required at beginning and end of shift Comments: Highest scan level seen in this room was 776 cpm Smears taken - see map for location 14A and 15A - No positive activity detected Attach survey map to this document Technician/Surveyor: Byron Bland Name Signature Supervisor/Reviewer: Joseph W. Moon, CHP Date: 4/11/2007		-		·	- Log				
Detector Model: Detector Model: PR145081 PR145	Sackground Information Detector Serial Number: PR145081 PR145081	-				3	-			
Background Information Bkgd Invest. Alarm Level Level Level Source Checks 8 Inch file β Floor 618 cpm 1236 cpm Prior: 2/22/2007 1400 bwb	Bigd Invest Level Level Level Source Checks		•			-				
Bkgd Invest. Level Level Level Source Checks 8 inch tile β Floor 618 cpm 1236 cpm Prior: 2/22/2007 1400 bwb 6 inch tile β Floor 618 cpm 1236 cpm Prior: 2/22/2007 1655 bwb 7 inch tile β Floor 618 cpm 1236 cpm Prior: 2/22/2007 1400 bwb 8 inch tile β Floor 618 cpm 1236 cpm Prior: 2/22/2007 1655 bwb 9 inch tile β Floor 618 cpm 1236 cpm Prior: 2/22/2007 1655 bwb 10 inch tile β Floor 618 cpm 1400 bwb End: 2/22/2007 1655 bwb 10 inch tile β Floor 618 cpm 1400 bwb End: 2/22/2007 1655 bwb 10 inch tile β Floor 618 cpm 1400 bwb End: 2/22/2007 1655 bwb 10 inch tile β Floor 618 cpm 1400 bwb End: 2/22/2007 1655 bwb 10 inch tile β Floor 618 cpm 1400 bwb End: 2/22/2007 1655 bwb End: 2/22/2007 End: 2/22/2007 End: 2/22/2007 End: 2/22/2007 End: 2/22/2007 End: 2/22/2007 End: 2/22/2007 End: 2/22/2007 End: 2/22/2007 End: 2/22/2007 End: 2/22/2007 End:	Sinch tile β Floor G18 cpm 1236 cpm					Detec				
Bkgd Invest. Level Level Level Source Checks 8 inch tile β Floor 618 cpm 1236 cpm	Bkgd Invest. Alarm Level Level Source Checks 8 inch tile β Floor 618 cpm 1236 cpm Prior: 2/22/2007 1400 bwb End: 2/22/2007 1655 bwb End: 2/22/2007 1	Background Infor	mation							
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Name Signature Supervisor/Reviewer: Joseph W. Moon, CHP Date: 4/11/2007	Name Signature Supervisor/Reviewer: Joseph W. Moon, CHP Date: 4/11/2007	Technicia	n/Surveyor:	Byron Blan	ıd	/	Carrie Charle	Date:	4/11/2007	
				Name			Signature	_		
		Superviso	r/Reviewer	Joseph W	Moon, CHF	- 12 mg	of a my	Date [.]	4/11/2007	
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Hall C-1



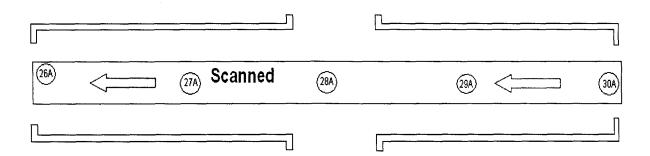
					Survey Requireme	ents		
Area Classification:	3				Beta	Gamı	ma	
Building/Area:	C-2			Floor	20%			
Floor/Elevation:	Floor			Wall				
Survey Unit/Grid:			-	Ceiling				
Surface:	8 inch tile		Actual s	surveyed	30%			
Survey Type:	β scan 771	cm ² probe						
Date/Time:	2/22/2007		-					
					Instrume	nt Informa	<u>tion</u>	
Floor Monitor I	D Number:				MARSS Inst ID:			
Alpha/Beta So	an Speed:	2.5 inches/se	ec	-	Logger Model:	2350-1		
Alpha/Beta So	an Height:	1/2 inch		- Lo	ogger Serial Number:	149408		
•	an Speed:			-	Cal Due Date:	10/22/2007		
	an Height:			-	Detector Model:	43-37-1		,
	_			Det	ector Serial Number:	PR145081		
Background Infor	mation				•			
Material Material	Bkgd Level	invest. Level	Alarm Level		Source Che	cks		
8 inch tile β Floor	618 cpm	1236 cpm		1		Date	Time	Initials
o mon die priodi	Отосра	1200 CP(1)		1	Prior	2/22/2007	1400	bwb
				1		2/22/2007	1655	bwb
<u> </u>				ł	Elia.	2/22/2001	1000	DWD
<u></u>				Note: Sol	arce checks required at b	neginning and	and of shif	+
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l .	an level see	n in this roon	n was 776 d	com				
1		nap for location		· F · · ·				
		positive activi						
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No activity	found in exc	ess of the Ro	G 1.86 (197	4) clean-up	quidelines			
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		**			1 1 1 1			
Technicia	n/Surveyor:	Byron Bland	tt		1 years burst	Date:	4/11/2007	
		Name			Signature	_		
				و مان ا	2 mb 10 20			
Superviso	r/Reviewer:	Joseph W. N	Moon, CHP			Date:	4/11/2007	
		Name			Signature	_		
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Hall C-2



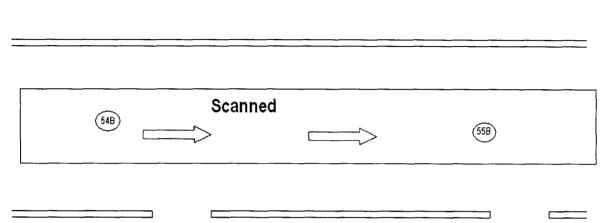
					Survey Requireme	nts		
Area Classification:	3				Beta	Gamm	na	ļ
	C-3			Floor	20%			Ī
Building/Area:	Floor			Wall				ļ
Floor/Elevation:	FIOOI			Ceiling				
Survey Unit/Grid:	8 inch tile		Actual sur	_	30%			ļ
Survey Type:		m² probo	7101001 001	,				
Date/Time:		ili bione						
Date/Time.	2/22/2001				Instruma	nt Informat	ion	
						nt imormat	<u></u>	:
Floor Monitor I	D Number:				MARSS Inst ID:			
Alpha/Beta S		2.5 inches/s	ес		Logger Model:	2350-1		
Alpha/Beta So	-			L	ogger Serial Number:	149408		
	can Speed:				Cal Due Date:	10/22/2007		
	can Height:				Detector Model:	43-37-1		
	-			De	tector Serial Number:	PR145081		
Background Infor	<u>mation</u>							
	Bkgd	Invest.	Alarm		O a compa Cha	مادم		
Material	Level	Level	Level		Source Che	CKS		
8 inch tile β Floor	618 cpm	1236 cpm				Date	Time	Initials
O Milot die p v vee					Prior:	2/22/2007	1400	bwb
					End:	2/22/2007	1655	bwb
				Note: Sc	ource checks required at	beginning and	end of shif	t
Comments:								
	an lavel seer	in this room	ı was 803 cpi	m				
	ken - see m							
	jh 30A - No p							
26A throug	jn 30A - No p	ositive activ	ity detected					
N	farmal in ove	one of the P	G 1.86 (1974) clean-ii	n quidelines			
No activity	touna in exc	ess of the K	G 1.60 (1974) Clean-u	p galaciii loo			
		Attach sur	vey map to t	this docu	ıment			
Tochnic	ian/Surveyor	- Byron Blar	nd		They was to have	Date:	4/11/2007	
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Suponis	sor/Reviewer	· Joseph W	Moon, CHP		sayap willywy	Date:	4/11/2007	,
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Hall C-3

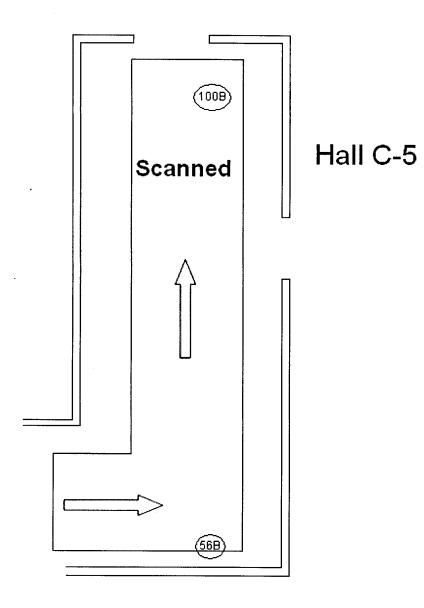


					Common De audus			
Area Classification:	2				Survey Requireme	ents Gami	ma	
Building/Area:	3 Hall C	C-4/C-5		Floor	20%	Gailli	ııa T	
Floor/Elevation:		5-4/0-5		Wall	2076			
Survey Unit/Grid:	1 1001			Ceiling				
	covered flo	or	Actua	l surveyed	35%	<u> </u>		
Survey Type:			7.00					
Date/Time:		on proce		1.				ŀ
					Instrume	nt Informa	<u>tion</u>	
Floor Monitor IC	Number:				MARSS Inst ID:			
Alpha/Beta Sc		2.5 inches/se	c	•	Logger Model:	2350-1		
Alpha/Beta Sc	an Height:	1/2 inch		Log	gger Serial Number:	149408		
Gamma Sc	an Speed:				Cal Due Date:	10/22/2007		
Gamma Sc	an Height:			•	Detector Model:	43-37-1		
				Dete	ctor Serial Number:	PR145081		
Background Infor	<u>mation</u>							
	Bkgd	Invest.	Alarm		Source Che	cks		
Material	Level	Level	Level	1	00000			
covered wood	828 cpm	1.65k cpm			n .	Date	Time	Initials
						2/23/2007	925	bwb
				ĺ	End:	2/23/2007	1635	bwb
				Note: Sour	ce checks required at t	beginning and	end of snif	τ
Comments:								
1	n loval cas	n in this room	wan 1 OAk	oom				
1		nap for locatio		Срп				
Į.		0B on floor - N		activity detac	tod			
545 through	11 300 01 100	יו - וטטוו ווט מכ	io positive a	activity detec	leu			
}								
No activity	found in eve	cess of the RC	1 86 (107)	4) clean-un c	u idelines			
140 activity	lound in exc	ess of the rec	7 1.00 (137	T) Gear-up g	juluelines			
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2000	•	Name				•		
Superviso	•			<u> </u>	Signature	•	4/11/2007	

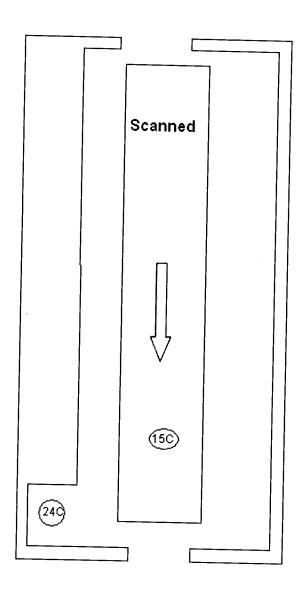
Hall C-4



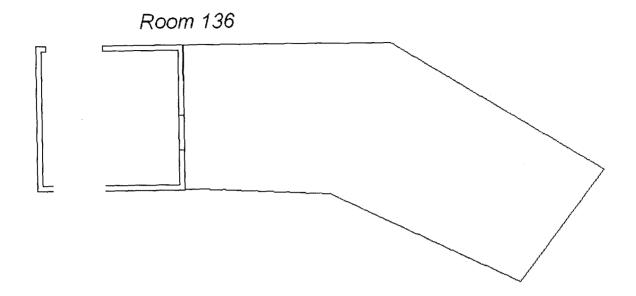
					Survey Requireme	ents		
Area Classification:	3				Beta	Gamı	ma	
Building/Area:	Hall C-6			Floor	20%			
Floor/Elevation:	Floor			Wall				
Survey Unit/Grid:				Ceiling				
	8 inch tile		Actua	i surveyed	40%			
Survey Type:		cm ² probe						
	2/23/2007				-			
					Instrume	nt Informa	<u>tion</u>	
Floor Monitor	ID Number:				MARSS Inst ID:			
Alpha/Beta S	can Speed:	2.5 inches/s	sec		Logger Model:	2350-1		
Alpha/Beta Se		1/2 inch		Lo	gger Serial Number:	149408		
Gamma S	can Speed:				Cal Due Date:	10/22/2007		
Gamma So	can Height:				Detector Model:	43-37-1		
				Det	ector Serial Number:	PR145081		
Background Info	mation							
Material	Bkgd Level	invest. Level	Alarm Levei		Source Che	cks		
8 inch tile β Floor	618 cpm	1236 cpm				Date	Time	Initials
					Prior:	2/23/2007	925	bwb
					End:	2/23/2007	1635	bwb
				Note: Sou	rce checks required at I	beginning and	end of shif	t
Smears ta	an level seer ken - see m or and 24C ii	ap for locati	ion		tected			
	found in exc	ess of the R	G 1.86 (197	74) clean-ul	o guidelines			
		Attach surv	vey map to	this docu	nent			
Technicia	an/Surveyor:	Byron Blan	d		Page Strand	Date:	4/11/2007	
	,	Name			Signature	-	<u> </u>	
Superviso	or/Reviewer:	Joseph W. Name	Moon, CHP		Signature	Date: _	<u>4/11/2007</u>	

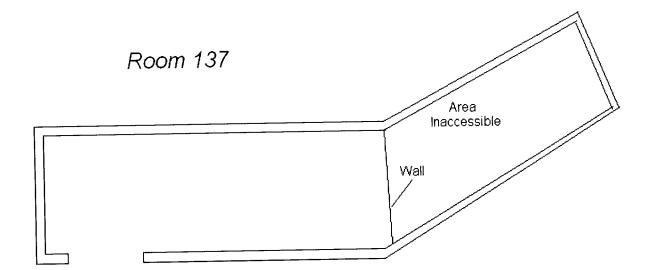


					Survey Requireme	ents		
Area Classification:	1				Beta	Gam	ıma	
Building/Area:	All class 1	areas		Floor				
Floor/Elevation:				Wall				
Survey Unit/Grid:				Ceiling				
Surface:	all surfaces		Clas	s 1 areas		100%		
Survey Type:			_					
Date/Time:	3/22/2	007						
					Instrume	nt Informa	ation .	
					MARSS Inst ID:		!	
					Logger Model:			
				Lo	gger Serial Number:			
					Cal Due Date:	9/20/2007	9/19/2007	
					Detector Model:	Model 19	model 19	
				Det	ector Serial Number:	180302	182679	
Background Infor	mation							
*****	Blad Lovel	invest. Level	Alarm Level		Source Che	cks		
Material	Bkgd Level		Level			Date	Time	Initials
All material	8-15 µR/hr	30 μR/hr			Prior	2/22/2007	820	bwb
						2/22/2007	1200	bwb
					Liiu.	212212001	1200	5415
				Note: So	urce checks required at t	peginning an	d end of shift	t
		L		11010. 001	aroo orroone required at a			
Comments:								
Comments.								
No elevate	d levels were	detected ex	cept for					
l .	37 and 136 bu							
	kground mate			hat the lea	ives			
1	ese two rooms							
			•					
		Attach sur	vey map to t	this docu	ment			
Technic	cian/Surveyor:	Byron Blan	nd		Francis Charles	Date	: 4/11/2007	
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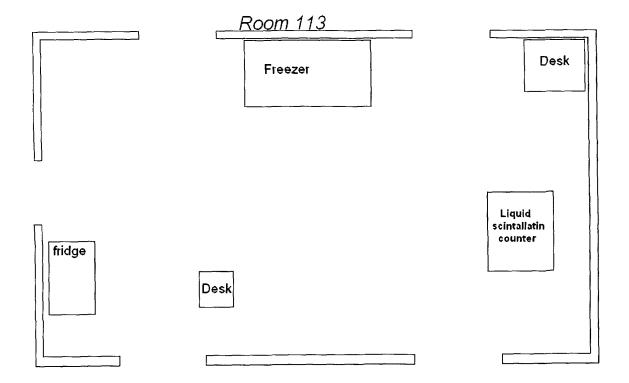


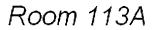
Hall C-6

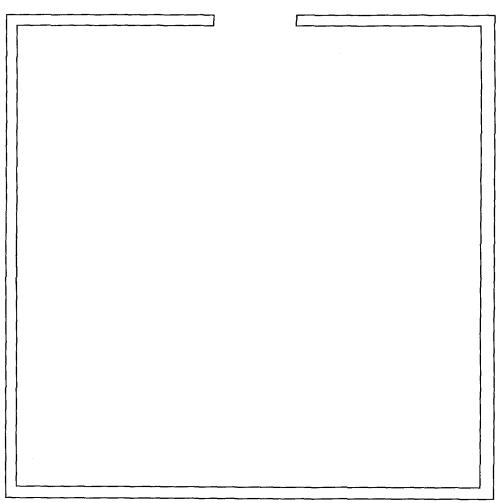




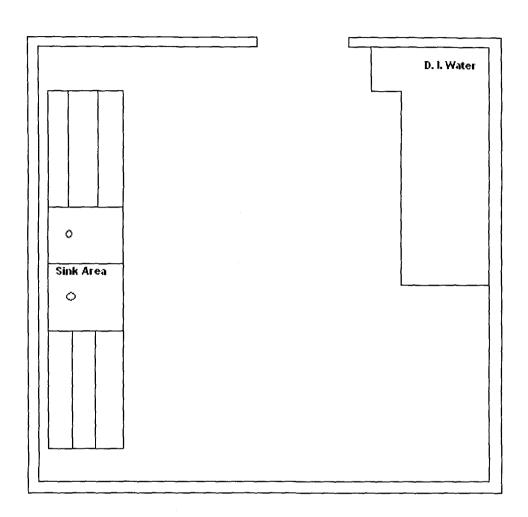
					Survey Requireme	ents		,
Area Classification:	1				Beta	Gamr	ma	
Building/Area:	Room 11	3,a,b,c,d		Floor				
Floor/Elevation:	All objects	s in rooms		Wall				
Survey Unit/Grid:				Ceiling				
Surface:	misc ab	ove floor	Materia	al in rooms	100%			
Survey Type:	β scan 126	cm² probe						
	2/23/2007a		7					'
Floor Monitor I					Instrume	nt Informa	tion_	į
Alpha/Beta S			sec		Logger Model:	2350-1		
Alpha/Beta So	can Height:	1/2 inch		. Lo	gger Serial Number:	149408		
Gamma S	can Speed:			-	Cal Due Date:	10/22/2007		
Gamma So	can Height:				Detector Model:	43-68		
				Dete	ector Serial Number:	Pr148454		
Background Infor	<u>mation</u>							
Material	Bkgd Level	invest. Level	Alarm Level		Source Che	cks		
Misc	225β cpm	450β cpm		1		Date	Time	Initials
					Prior:	3/22/2007	905	bwb
					End:	3/22/2007	1200	bwb
]				ļ
				Note: Sou	rce checks required at b	peginning and	end of shif	t
	e levels of con 113D on th		-	d in rooms 1	13B on the lab sink			
		Attach sur	vey map to	this docum	nent 		··_ · · · · · · · · · · · · · · · · · ·	
Technicia	ın/Surveyor:	Byron Blan	nd		Paris Carrier	Date:	4/11/2007	·
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Superviso	or/Reviewer:		Moon, CHF		zaf 60 27/mg	Date:	4/11/2007	
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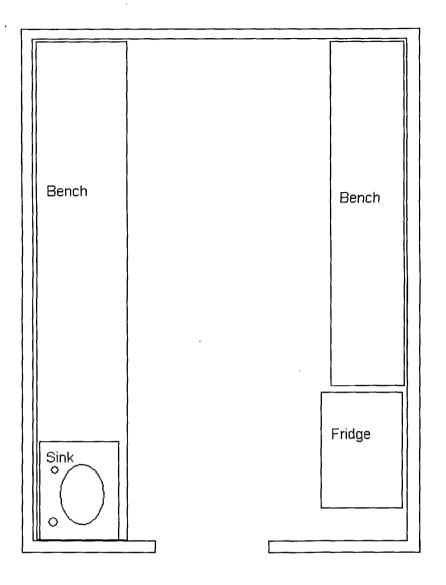






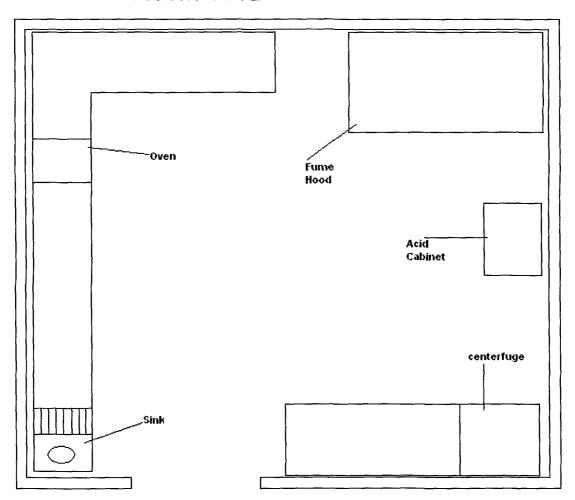
Room 113B





113C

Room 113D



Attachment 2.0 U. S. NRC Regulatory Guide 1.86 (1974)

REGULATORY GUIDE 1.86

TERMINATION OF OPERATING LICENSES FOR NUCLEAR REACTORS

A. INTRODUCTION

Section 50.51, "Duration of license, renewal," of 10 CFR Part 50, "Licensing of Production and Utilization Facilities," requires that each license to operate a production and utilization facility be issued for a specified duration. Upon expiration of the specified period, the license may be either renewed or terminated by the Commission. Section 50.82, "Applications for termination of licenses," specifies the requirements that must be satisfied to terminate an operating license, including the requirement that the dismantlement of the facility and disposal of the component parts not be inimical to the common defense and security or to the health and safety of the public. This guide describes methods and procedures considered acceptable by the Regulatory staff for the termination of operating licenses for nuclear reactors. The Advisory Committee on Reactor Safeguards has been consulted concerning this guide and has concurred in the regulatory position.

B. DISCUSSION

When a licensee decides to terminate his nuclear reactor operating license, he may, as a first step in the process, request that his operating license be amended to restrict him to possess but not operate the facility. The advantage to the licensee of converting to such a possession-only license is reduced surveillance requirements in that periodic surveillance of equipment important to the safety of reactor operation is no longer required. Once this possession-only license is issued, reactor operation is not permitted. Other activities related to cessation of operations such as unloading fuel from the reactor and placing it in storage (either onsite of offsite) may be continued.

A licensee having a possession-only license must retain, with the Part 50 license, authorization for special nuclear material (10 CFR Part 70, "Special Nuclear Material"), byproduct material (10 CFR Part 30, "Rules of General Applicability to Licensing of Byproduct Material"), and source material (10 CFR Part 40. "Licensing of Source Material"), until the fuel, radioactive components, and sources are removed from the facility. Appropriate administrative controls and facility requirements are imposed by the Part 50 license and the technical specifications to assure that proper surveillance is performed and that the reactor facility is maintained in a safe condition and not operated.

A possession-only license permits various options and procedures for decommissioning, such as mothballing, entombment, or dismantling. The requirements imposed depend on the option selected.

Section 50.82 provides that the licensee may dismantle and dispose of the component parts of a nuclear reactor in accordance with existing regulations. For research reactors and critical facilities, this has usually meant the disassembly of a reactor and its shipment offsite, sometimes to another appropriately licensed organization for further use. The site from which a reactor has been removed must be decontaminated, as necessary, and inspected by the Commission to determine whether unrestricted access can be approved. In the case of nuclear power reactors, dismantling has usually been accomplished by shipping fuel offsite, making the reactor inoperable, and disposing of some of the radioactive components.

Radioactive components may be either shipped offsite for burial at an authorized burial ground or secured

USAEC REGULATORY GUIDES

Regulatory Guides are issued to describe and make available to the public methods acceptable to the AEC Regulatory staff of implementing specific parts of methods acceptable to the ACC Regulatory start or implementing specific parts of the Commission's regulations, to delineate techniques used by the staff in evaluating specific problems or postulated accidents, or to provide guidence to applicants. Regulatory Guides are not substitutes for regulations and compliance with them is not required. Methods and solutions different from those set out in the guides will be acceptable if they provide a basis for the findings requisite to the issuance or continuance of a permit or license by the Commission.

Published guides will be revised periodically, as appropriate, to accommodate comments and to reflect new information or experience.

Copies of published guides may be obtained by request indicating the divisions desired to the U.S. Atomic Energy Commission, Washington, D.C. 20545, Attention: Director of Regulatory Standards. Comments and suggestions for improvements in these guides are encouraged and should be sent to the Secretary of the Commission, U.S. Atomic Energy Commission, Washington, D.C. 20545, Attention: Chief, Public Proceedings Staff.

The guides are issued in the following ten broad divisions:

- **Power Reactors**

- 2. Research and Test Reactors
 3. Fuels and Materials Facilities
 4. Environmental and Siting
 5. Materials and Plant Protection
- 6. Products
 7. Transportation
- 8. Occupational Health 9. Antitrust Review
 10. General

on the site. Those radioactive materials remaining on the site must be isolated from the public by physical barriers or other means to prevent public access to hazardous levels of radiation. Surveillance is necessary to assure the long term integrity of the barriers. The amount of surveillance required depends upon (1) the potential hazard to the health and safety of the public from radioactive material remaining on the site and (2) the integrity of the physical barriers. Before areas may be released for unrestricted use, they must have been decontaminated or the radioactivity must have decayed to less than prescribed limits (Table I).

The hazard associated with the retired facility is evaluated by considering the amount and type of remaining contamination, the degree of confinement of the remaining radioactive materials, the physical security provided by the confinement, the susceptibility to release of radiation as a result of natural phenomena, and the duration of required surveillance.

C. REGULATORY POSITION

1. APPLICATION FOR A LICENSE TO POSSESS BUT NOT OPERATE (POSSESSION-ONLY LICENSE)

A request to amend an operating license to a possession-only license should be made to the Director of Licensing, U.S. Atomic Energy Commission, Washington, D.C. 20545. The request should include the following information:

- a. A description of the current status of the facility.
- b. A description of measures that will be taken to prevent criticality or reactivity changes and to minimize releases of radioactivity from the facility.
- c. Any proposed changes to the technical specifications that reflect the possession-only facility status and the necessary disassembly/retirement activities to be performed.
- d. A safety analysis of both the activities to be accomplished and the proposed changes to the technical specifications.
- e. An inventory of activated materials and their location in the facility.

2. ALTERNATIVES FOR REACTOR RETIREMENT

Four alternatives for retirement of nuclear reactor facilities are considered acceptable by the Regulatory staff. These are:

a. Mothballing. Mothballing of a nuclear reactor facility consists of putting the facility in a state of protective storage. In general, the facility may be left intact except that all fuel assemblies and the radioactive

fluids and waste should be removed from the site. Adequate radiation monitoring, environmental surveillance, and appropriate security procedures should be established under a possession-only license to ensure that the health and safety of the public is not endangered.

- b. In-Place Entombment. In-place entombment consists of sealing all the remaining highly radioactive or contaminated components (e.g., the pressure vessel and reactor internals) within a structure integral with the biological shield after having all fuel assemblies, radioactive fluids and wastes, and certain selected components shipped offsite. The structure should provide integrity over the period of time in which significant quantities (greater than Table I levels) of radioactivity remain with the material in the entombment. An appropriate and continuing surveillance program should be established under a possession-only license.
- c. Removal of Radioactive Components and Dismantling. All fuel assemblies, radioactive fluids and waste, and other materials having activities above accepted unrestricted activity levels (Table I) should be removed from the site. The facility owner may then have unrestricted use of the site with no requirement for a license. If the facility owner so desires, the remainder of the reactor facility may be dismantled and all vestiges removed and disposed of.
- d. Conversion to a New Nuclear System or a Fossil Fuel System. This alternative, which applies only to nuclear power plants, utilizes the existing turbine system with a new steam supply system. The original nuclear steam supply system should be separated from the electric generating system and disposed of in accordance with one of the previous three retirement alternatives.
- 3. SURVEILLANCE AND SECURITY FOR THE RE-TIREMENT ALTERNATIVES WHOSE FINAL STATUS REQUIRES A POSSESSION-ONLY LICENSE
- A facility which has been licensed under a possession-only license may contain a significant amount of radioactivity in the form of activated and contaminated hardware and structural materials. Surveillance and commensurate security should be provided to assure that the public health and safety are not endangered.
- a. Physical security to prevent inadvertent exposure of personnel should be provided by multiple locked barriers. The presence of these barriers should make it extremely difficult for an unauthorized person to gain access to areas where radiation or contamination levels exceed those specified in Regulatory Position C.4. To prevent inadvertent exposure, radiation areas above 5 mR/hr, such as near the activated primary system of a power plant, should be appropriately marked and should not be accessible except by cutting of welded closures or the disassembly and removal of substantial structures

and/or shielding material. Means such as a temotereadout intrusion alarm system should be provided to indicate to designated personnel when a physical barrier is penetrated. Security personnel that provide access control to the facility may be used instead of the physical barriers and the intrusion alarm systems.

- b. The physical barriers to unauthorized entrance into the facility, e.g., fences, buildings, welded doors, and access openings, should be inspected at least quarterly to assure that these barriers have not deteriorated and that locks and locking apparatus are intact.
- c. A facility radiation survey should be performed at least quarterly to verify that no radioactive material is escaping or being transported through the containment barriers in the facility. Sampling should be done along the most probable path by which radioactive material such as that stored in the inner containment regions could be transported to the outer regions of the facility and ultimately to the environs.
- d. An environmental radiation survey should be performed at least semiannually to verify that no significant amounts of radiation have been released to the environment from the facility. Samples such as soil, vegetation, and water should be taken at locations for which statistical data has been established during reactor operations.
- e. A site representative should be designated to be responsible for controlling authorized access into and movement within the facility.
- f. Administrative procedures should be established for the notification and reporting of abnormal occurrences such as (1) the entrance of an unauthorized person or persons into the facility and (2) a significant change in the radiation or contamination levels in the facility or the offsite environment.
 - g. The following reports should be made:
- (1) An annual report to the Director of Licensing, U.S. Atomic Energy Commission, Washington, D.C. 20545, describing the results of the environmental and facility radiation surveys, the status of the facility, and an evaluation of the performance of security and surveillance measures.
- (2) An abnormal occurrence report to the Regulatory Operations Regional Office by telephone within 24 hours of discovery of an abnormal occurrence. The abnormal occurrence will also be reported in the annual report described in the preceding item.
- h. Records or logs relative to the following items should be kept and retained until the license is terminated, after which they may be stored with other plant records:

- (1) Environmental surveys;
- (2) Facility radiation surveys,
- (3) Inspections of the physical barriers, and
- (4) Abnormal occurrences.

4. DECONTAMINATION FOR RELEASE FOR UN-RESTRICTED USE

If it is desired to terminate a license and to eliminate any further surveillance requirements, the facility should be sufficiently decontaminated to prevent risk to the public health and safety. After the decontamination is satisfactorily accomplished and the site inspected by the Commission, the Commission may authorize the license to be terminated and the facility abandoned or released for unrestricted use. The licensee should perform the decontamination using the following guidelines:

- a. The licensee should make a reasonable effort to eliminate residual contamination.
- b. No covering should be applied to radioactive surfaces of equipment or structures by paint, plating, or other covering material until it is known that contamination levels (determined by a survey and documented) are below the limits specified in Table I. In addition, a reasonable effort should be made (and documented) to further minimize contamination prior to any such covering.
- c. The radioactivity of the interior surfaces of pipes, drain lines, or ductwork should be determined by making measurements at all traps and other appropriate access points, provided contamination at these locations is likely to be representative of contamination on the interior of the pipes, drain lines, or ductwork. Surfaces of premises, equipment, or scrap which are likely to be contaminated but are of such size, construction, or location as to make the surface inaccessible for purposes of measurement should be assumed to be contaminated in excess of the permissable radiation limits.
- d. Upon request, the Commission may authorize a licensee to relinquish possession or control of premises, equipment, or scrap having surfaces contaminated in excess of the limits specified. This may include, but is not limited to, special circumstances such as the transfer of premises to another licensed organization that will continue to work with radioactive materials. Requests for such authorization should provide:
- (1) Detailed, specific information describing the premises, equipment, scrap, and radioactive contaminants and the nature, extent, and degree of residual surface contamination.

- (2) A detailed health and safety analysis indicating that the residual amounts of materials on surface areas, together with other considerations such as the prospective use of the premises, equipment, or scrap, are unlikely to result in an unreasonable risk to the health and safety of the public.
- e. Prior to release of the premises for unrestricted use, the licensee should make a comprehensive radiation survey establishing that contamination is within the limits specified in Table I. A survey report should be filed with the Director of Licensing, U.S. Atomic Energy Commission, Washington, D.C. 20545, with a copy to the Director of the Regulatory Operations Regional Office having jurisdiction. The report should be filed at least 30 days prior to the planned date of abandonment. The survey report should:
 - (1) Identify the premises;
- (2) Show that reasonable effort has been made to reduce residual contamination to as low as practicable levels:
- (3) Describe the scope of the survey and the general procedures followed; and
- (4) State the finding of the survey in units specified in Table 1.

After review of the report, the Commission may inspect the facilities to confirm the survey prior to granting approval for abandonment.

5. REACTOR RETIREMENT PROCEDURES

As indicated in Regulatory Position C.2, several alternatives are acceptable for reactor facility retirement. If minor disassembly or "mothballing" is planned, this could be done by the existing operating and maintenance procedures under the license in effect. Any planned actions involving an unreviewed safety question

or a change in the technical specifications should be reviewed and approved in accordance with the requirements of 10 CFR §50.59.

If major structural changes to radioactive components of the facility are planned, such as removal of the pressure vessel or major components of the primary system, a dismantlement plan including the information required by §50.82 should be submitted to the Commission. A dismantlement plan should be submitted for all the alternatives of Regulatory Position C.2 except mothballing. However, minor disassembly activities may still be performed in the absence of such a plan, provided they are permitted by existing operating and maintenance procedures. A dismantlement plan should include the following:

- a. A description of the ultimate status of the facility
- b. A description of the dismantling activities and the precautions to be taken.
- c. A safety analysis of the dismantling activities including any effluents which may be released.
- d. A safety analysis of the facility in its ultimate status.

Upon satisfactory review and approval of the dismantling plan, a dismantling order is issued by the Commission in accordance with §50.82. When dismantling is completed and the Commission has been notified by letter, the appropriate Regulatory Operations Regional Office inspects the facility and verifies completion in accordance with the dismantlement plan. If residual radiation levels do not exceed the values in Table I, the Commission may terminate the license. If these levels are exceeded, the licensee retains the possession-only license under which the dismantling activities have been conducted or, as an alternative, may make application to the State (if an Agreement State) for a byproduct materials license.

TABLE I
ACCEPTABLE SURFACE CONTAMINATION LEVELS

NUCLIDEa	AVERAGE ^{b c}	MAXIMUM ^{b d}	REMOVABLE ^{b e}
U-nat, U-235, U-238, and associated decay products	5,000 dpm a/100 cm ²	15,000 dpm a/100 cm ²	1.000 dpm a/100 cm ²
Transuranics, Ra-226, Ra-228, Th-230, Th-228, Pa-231, Ac-227, I-125, I-129	100 dpm/100 cm ²	300 dpm/100 cm ²	20 dpm/100 cm ²
Th-nat, Th-232, Sr-90, Ra-223, Ra-224, U-232, I-126, I-131, I-133	1000 dpm/100 cm ²	3000 dpm/100 cm ²	200 dpm/100 cm ²
Beta-gamma emitters (nuclides with decay modes other than alpha emission or spontaneous fission) except Sr-90 and others noted above.	5000 dpm β-γ/100 cm ²	15,000 dpm β-γ/100 cm ²	1000 dpm β-γ/100 cm ²

²Where surface contamination by both alpha- and beta-gamma-emitting nuclides exists, the limits established for alpha- and beta-gamma-emitting nuclides should apply independently.

bAs 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.

^cMeasurements 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.

dThe maximum contamination level applies to an area of not more than 100 cm².

The amount of removable radioactive material per 100 cm² 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, the pertinent levels should be reduced proportionally and the entire surface should be wiped.

Attachment 3.0 Instrument Calibration Records

RSO, Inc. P.O. Box 1450 Laurel, MD 20725 (301) 953-2482

Certificate of Calibration

RSO Job No. 7040

ISSUED TO: Chesapeake Nuclear Services

788 Sonne Dr

Annapolis, MD 21401

INSTRUMENT: LUDLUM

MODEL: 2360 TYPE: DATA LOGGER SN: 141321

CONTACT: Stewart Bland PHONE: (410) 266-9174

PO NO: Credit Card

RSO, Inc. certifies that on 02/15/2007 the above described instrument was calibrated using a radioactive source to determine the efficiency for a specific radionuclide(s) and using electronically generated pulse for the linearity. Pulsed using Ludlum 500-2, S/N 159110.

The results are tabulated below. Calibration is traceable to NIST.

Calibration Data

	RANGE	EXPECTED	OBSER	VED	<u>C.F.</u>
X	1	100	100	epm	1.00
		400	400	cpm	1.00
X	10	1000	1000	epm	1.00
		4000	4000	epm	1.00
X	100	00001	10000	epm	1.00
		40000	40000	cpm	1.00
X	1000	100000	100000	cpm	1.00
		400000	400000	cpm	100
			C.F	. AVERAGE T	1.00

Probe type(s) Probe1: PROPORTIONAL

Probe2.

Probe3:

MODEL SER# WINDOW GEOMETRY VOLT ISOTOPE I EFF.(%) ISOTOPE 2 EFF.(%) ISOTOPE 3 EFF.(%) ISOTOPE 4 EFF.(%)

43-68 PR148454 FIXED CONTACT Tc99

INSTRUMENT CHECKS

ENVIRONMENTAL

I mR/hr CHECK: BATTERY CHECK: NORMAL CHECK SOURCE 1: N/A CHECK SOURCE 2: N/A READING

READING:

TEMP: 24 °C PRESS: 759 mmHg HUMID: 23 %

THE SUGGESTED RECALIBRATION DATE FOR THIS INSTRUMENT IS 02/15/2008

Calibrated By:

Reviewed By:

Cal Date: 02/15/2007

Maryland License MD-33-021-01

4380

RSO, Inc. P.O. Box 1450 Laurel, MD 20725 (301) 953-2482

Certificate of Calibration

INSTRUMENT: LUDLUM MODEL: 2360 TYPE: DATA LOGGER

SN: 141311

RSO Job No. 7040

ISSUED TO: Chesapeake Nuclear Services 788 Sonne Dr.

Annapolis, MD 21401

CONTACT: Stewart Bland PHONE: (410) 266-9174

PO NO: Credit Card

RSO, Inc. certifies that on 02/15/2007 the above described instrument was calibrated using a radioactive source to determine the efficiency for a specific radionuclide(s) and using electronically generated pulse for the linearity. Pulsed using Ludlum 500-2, S/N 159110.

The results are tabulated below. Calibration is traceable to NIST.

Calibration Data

	RANGE	EXPECTED	OBSER	RVED	<u>C.F.</u>
Х	1	100 400	103 400	cpm	0.97 1.00
х	10	1000	1000	cpm cpm	00.1
х	100	4 000 10000	4000 10000	cpm cpm	1.00 1.00
x	1000	40000 100000	40000 100280	cpm cpm	1.00 1.00
		400000	400000 C 1	cpm F AVERAGE	$\frac{1.00}{1.00}$

Probe type(s) Probe1: PROPORTIONAL

Probe2:

Probe3:

MODEL SER# WINDOW GEOMETRY VOLT ISOTOPE 1 EFF.(%) ISOTOPE 2 EFF.(%) ISOTOPE 3 EFF.(%) ISOTOPE 4 EFF.(%) 43-68 PR 148454 FIXED Tc99 C14 20 CONTACT 1658

INSTRUMENT CHECKS

ENVIRONMENTAL

1 mR/hr CHECK: BATTERY CHECK: NORMAL CHECK SOURCE 1: N/A READING: CHECK SOURCE 2: N/A

READING:

PRESS: 759 mmHg HUMID: 24 %

THE SUGGESTED RECALIBRATION DATE FOR THIS INSTRUMENT IS 02/15/2008

Calibrated By:

Reviewed By:

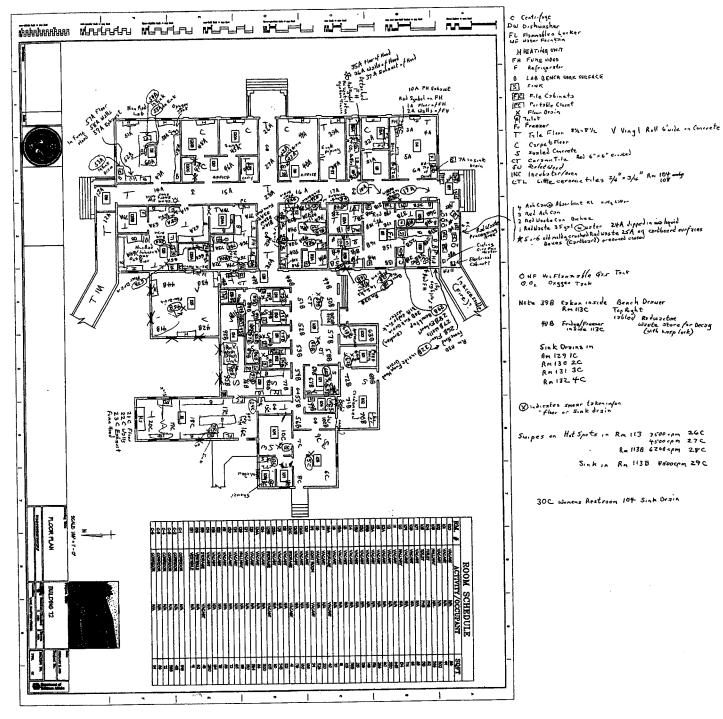
Rag

Cal Date: 02/15/2007

Maryland License MD-33-021-01

4381

Attachment 4.0 Large Area Survey Map Initial Survey



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Attachment 5.0 Initial Smear Survey Results



Radiation Service Organization

March 7, 2007

Chesapeake Nuclear Attn: Stewart Bland 788 Sonne Dr. Annapolis, MD 21401

Dear Mr. Bland,

Enclosed please find the results for the wipe tests received on February 26, 2007. The wipe tests were analyzed using Liquid Scintillation and Gamma Counters. An individual data print out for each analysis process is attached for your review. The only elevated activity indicated on the analysis reports were as follows:

Wipe test group B1-B100 found 3 wipe tests exceeding 100 but less than 300 dpm. Wipe test group C1-C30 found 1 wipe test exceeding 100 but less than 300 dpm.

All other results indicated activity levels below 50 dpm which included the gamma test results.

If you have any questions please do not hesitate to call me at (301) 953-2482 ext. 305 or by e-mail james.dean@rsoinc.com.

Sincerely,

James W. Dean

James W.L

Manager, Radiation Safety Services – Radiation Safety Officer

JWD:11P

Enclosure

Protocol# 1 - Triple Lable DPM.lsa

NIH

Assay Definition- Al-Aloo

Assay Description: CHESAPEAKE NUCLEAR

Assay Type: DPM (Triple) Report Name: Report1

Output Data Path: C:\Packard\Tricarb\Results\NIH\Triple Lable DPM

Raw Results Path: C:\Packard\Tricarb\Results\NIH\Triple Lable DPM\20070227 0946.results

Assay File Name: C:\Packard\TriCarb\Assays\Triple Lable DPM.lsa

Count Conditions-

Nuclide: Triple Label

Quench Indicator: tSIE/AEC

External Std Terminator (sec): 0.5 2s%

Pre-Count Delay (min): 0.00

Quench Sets:

Low Energy: 3H-TOL-7-17-06

Mid Energy: 14C-TOL-07-17-06

High Energy: 32P-UG-02-28-05 ··

Count Time (min): 5.00

Count Mode: Normal

Assay Count Cycles: 1

#Vials/Sample: 1

Repeat Sample Count: 1 Calculate % Reference: Off

Background Subtract: On - 1st Vial

Low CPM Threshold: Off 2 Sigma % Terminator: Off

Regions UL Bkg Subtract Α 0.0 12.0 1st Vial 1st Vial 156.0 В 12.0 1st Vial C 156.0 2000.0

Count Corrections-

Static Controller: On

Colored Samples: On

Luminescence Correction: On Heterogeneity Monitor: n/a Coincidence Time (nsec): 18 Delay Before Burst (nsec): 75

Half Life-

Half Life Correction: Off

Reference Date Reference Time Regions Half Life Units

A В

C

1 Damil				•					
I Kesui	.ts								
Time	CPMA	CPMB	CPMC	DPM1	DPM2	DPM3	SIS	tSIE	LUM
10.00	5	8	6	0	0	0	53.33	565.99	2
5.00	6	12	1	10	14	1	50.09	507.24	1
5.00	2	5	-1	3	6	-1	78.46	512.01	1
5.00	1	1	1	2	1	1	66.19	476.71	1
5.00	3	3	2	. 5	3	3	49.74	467.57	1
5.00	5	4	2	8	4	2	60.15	573.07	0
5.00	1	5	0	1	5	- 0	75.54	427.61	1
5.00	0	0	2	1	- 0	3	164.69	462.19	1
5.00	1	3	1	2	4	1	1.62	306.19	4
	Time 10.00 5.00 5.00 5.00 5.00 5.00 5.00	10.00 5 5.00 6 5.00 2 5.00 1 5.00 3 5.00 5 5.00 1 5.00 0	Time CPMA CPMB 10.00 5 8 5.00 6 12 5.00 2 5 5.00 1 1 5.00 3 3 5.00 5 4 5.00 1 5 5.00 0 0	Time CPMA CPMB CPMC 10.00 5 8 6 5.00 6 12 1 5.00 2 5 -1 5.00 1 1 1 5.00 3 3 2 5.00 5 4 2 5.00 1 5 0 5.00 0 0 2	Time CPMA CPMB CPMC DPM1 10.00 5 8 6 0 5.00 6 12 1 10 5.00 2 5 -1 3 5.00 1 1 1 2 5.00 3 3 2 5 5.00 5 4 2 8 5.00 1 5 0 1 5.00 0 0 2 1	Time CPMA CPMB CPMC DPM1 DPM2 10.00 5 8 6 0 0 5.00 6 12 1 10 14 5.00 2 5 -1 3 6 5.00 1 1 1 2 1 5.00 3 3 2 5 3 5.00 5 4 2 8 4 5.00 1 5 0 1 5 5.00 0 0 0 2 1 -0	Time CPMA CPMB CPMC DPM1 DPM2 DPM3 10.00 5 8 6 0 0 0 5.00 6 12 1 10 14 1 5.00 2 5 -1 3 6 -1 5.00 1 1 1 2 1 1 5.00 3 3 2 5 3 3 5.00 5 4 2 8 4 2 5.00 1 5 0 1 5 -0 5.00 0 0 2 1 -0 3	Time CPMA CPMB CPMC DPM1 DPM2 DPM3 SIS 10.00 5 8 6 0 0 0 0 53.33 5.00 6 12 1 10 14 1 50.09 5.00 2 5 -1 3 6 -1 78.46 5.00 1 1 1 1 2 1 1 66.19 5.00 3 3 2 5 3 3 49.74 5.00 5 4 2 8 4 2 60.15 5.00 0 0 0 2 1 -0 3 164.69	Time CPMA CPMB CPMC DPM1 DPM2 DPM3 SIS tSIE 10.00 5 8 6 0 0 0 0 53.33 565.99 5.00 6 12 1 10 14 1 50.09 507.24 5.00 2 5 -1 3 6 -1 78.46 512.01 5.00 1 1 1 2 1 1 66.19 476.71 5.00 3 3 2 5 3 3 49.74 467.57 5.00 5 4 2 8 4 2 60.15 573.07 5.00 0 0 0 2 1 5 -0 75.54 427.61 5.00 0 0 0 2 1 -0 3 164.69 462.19

		_	-	-	0	1	2	84.37	411.28	1
10	5.00	0	1	1				43.92	479.24	ĺ
11	5.00	3	2	-1	5	2	-2			
12	5.00	- 0	3	2	-1	3	3	103.07	466.05	1
13	5.00	-1	1	0	-3	1	-0	0.00	426.18	2
14	5.00	-3	2	1	-6	2	1	0.00	425.05	2
	5.00	1	2	0	2	3	0	76.50	463.16	1
15			3	-0	-3	4	- 0	162.91	474.31	1
16	5.00	-1						37.19	470.20	1
17	5.00	3	2	2	6	2	3			
18	5.00	-1	3	3	-3	3	3	121.02	435.72	1
19	5.00	-1	2	2	-2	2	2	70.56	412.71	1
20	5.00	-1	3	1	-2	3	1	131.99	463.25	1
		-1	3	ī	-4	4	2	75.56	443.58	1
21	5.00			-1	-5	1	-1	0.00	385.77	2
22	5.00	-2	0						300.45	4
23	5.00	-2	4	-1	- 9	6	-1	50.56		
24	5.00	-1	2	0	-4	3	0	0.00	336.11	1
25	5.00	1	4	- 0	0	5	- 0	48.35	476.27	1
26	5.00	-2	5	2	-6	6	2	77.54	401.47	1
27	5.00	-1	1	1	-2	1	2	191.16	464.66	3
			4	-0	-3	4	-0	121.77	450.80	1
28	5.00	-1					- 0	85.65	444.69	1
29	5.00	1	1	0	1	1				
30	5.00	-2	1	1	-4	2	1	0.00	434.83	2
31	5.00	-1	1	3	-2	' 1	4	0.00	457.58	3
32	5.00	-2	3	1	-5	4	1	165.62	440.46	1
33	5.00	1	2	2	2	1	2	42.15	473.72	1
		-1	3	1	-3	3	1	94.86	445.94	1
34	5.00				0	1	ī	26.39	467.69	1
35	5.00	0	1	1						
36	5.00	1	2	4	2	1	4	49.53	478.99	1
37	5.00	0	2	2	- 0	2	2	58.39	495.99	1
38	5.00	3	4	-1	4	4	-1	73.24	582.81	1
39	5.00	1	-0	-1	1	- 0	-1	202.71	530.46	1
40	5.00	-1	2	-1	-2	3	-1	154.80	477.57	1
			3	ī	-2	4	2	145.75	474.29	1
41	5.00	-0						0.00	450.80	1
42	5.00	-0	0	1	-0	- 0	1			
43	5.00	-1	3	1	-3	4	1	164.44	482.72	1
44	5.00	-1	3	1	-2	3	2	106.80	482.94	1
45	5.00	1	1	2	2	0	2	92.63	469.04	3
46	5.00	2	1	1	4	1	2	41.37	468.06	2
47	5.00	-0	3	0	-2	4	-0	68.89	444.83	1
			3	i	1	4	1	30.16	468.23	2
48	5.00	1			2	2	1	49.21	449.88	1
49	5.00	1	2	1						3
50	5.00	-0	1	-0	-1	2	- 0	0.00	437.52	
51	5.00	-2	2	1	~5	2	2	221.76	361.44	3
52	5.00	0	1	3	0	1	4	69.25	467.47	1
53	5.00	-0	1	1	-1	1	1	0.00	464.38	3
54	5.00	-1	Ō	3	-1	- 0	4	0.00	410.80	2
		0	3	1	-0	4	1	33.72	456.61	9
55	5.00				2	5	-0	52.90	463.19	ī
56	5.00	1	5	-0						
57	5.00	3	3	1	5	3	2	58.61	503.89	1
58	5.00	-0	5	3	-2	5	3	78.08	428.75	2
59	5.00	-0	2	3	-1	1	4	345.52	470.79	1
60	5.00	1.	2	2	1	2	2	148.95	531.00	1
61	5.00	1	4	3	1	4	3	35.79	422.45	2
62	5.00	-1	2	ō	-3	2	- 0	235.67	424.77	1
			2	1	-0	2	1	189.44	448.19	3
63	5.00	-0								3
64	5.00	-0	1	1	-1	2	1	9.18	444.92	2
65	5.00	1	3	1	0	3	1	43.93	444.11	2
66	5.00	1	-0	1	2	-1	2	0.00	470.64	1
67	5.00	- 0	2	2	-1	2	2	45.66	445.41	1
68	5.00	0	4	- 0	-1	5	- 0	52.53	485.27	2
69	5.00	1	3	1	1	3	1	44.72	493.74	1
70	5.00	-1	1	2	-2	1	2	0.00	359.14	1
71		-2	1	2	-4	ī	2	0.00	493.28	3
/ T	5.00	-2	1	2	-			2.00		~

72	5.00	-1	1	1	-2	1	1	0.00	443.49	2
73	5.00	-1	3	1	-3	3	1	92.85	489.84	3 3
74	5.00	2	2	1	4	2	1	67.75	500.40	1
75	5.00	-0	4	- 0	-1	5	-0	45.08	447.97	1
76	5.00	-0	-1	- 0	-1	-1	-0	0.00	474.57	2
77	5.00	2	5.	0	3	5	Õ	46.56	451.32	2
78	5.00	1	2	2	2	2	2	95.41	506.63	1
79	5.00	2	7	- 0	3	8	-1	59.05	528.17	1
80	5.00	1	4	-2	-0	6	-2	95.06	501.81	1
81	5.00	1	2	0	2	2	0	96.76	493.99	2
82	5.00	0	5	2	~1	6	2	65.41	440.00	1
83	5.00	- 0	2	2	-1	2	2	72.39	462.11	1
84	5.00	1	0	1	3	0	1	80.30	481.03	1
85	5.00	2	1	1	4	1	2	54.60	475.36	1
86	5.00	~ 0	2	1	-1	3	1	61.02	455.60	3
87	5.00	1	. 5	1	-0	6	1	70.80	470.08	2
88	5.00	1	- 0	-1	2	-0	-1	335.18	476.39	1
89	5.00	-2	1	2	-4	0	3	0.00	495.81	2
90	5.00	1	2	3	1	2	4	73.47	387.85	1
91	5.00	-0	0	1	-1	0	1	0.00	444.24	2
92	5.00	1	1	4	2	1	5	0.00	419.76	1
93	5.00	-1	3	1	-2	3	1	125.54	448.79	1
94	5.00	-0	2	3	-2	2	4	97.02	449.34	1
95	5.00	2	1	0	4	1	0	7.35	502.13	1
96	5.00	0	3	2	- 0	4	2	99.12	435.06	1
97	500	2	2	0	5	2	0	32.94	440.45	1
98	5.00	-0	5	2	-3	6	3	62.61	462.34	2
99	5.00	1	2	1	2	2	1	11.40	488.29	1
100	5.00	-1	2	0	-3	2	0	120.26	439.24	1
101	5.00	0	1	3	0	0	4	117.61	522.56	1

26 Feb 2007 14:20 Protocol #: 7

RSO, Inc.

SWIPES 1A-100A

Page #1 User : Lab Techniciar

CHESAPEAKE NUCLEAR

Count Time(minutes):

1.00

Assay Type:

CPM

Background Subtract : IPA Bkg

Outlier:

5.0 FLAG

%Spillup:

0.00

%Spilldown:

0.00

Screening:

OFF

REVIEWED BY: 2/28/07

	Window	A	Window B	•	Window C	
Nuclide:	I-125	15 - 75	keV Co-57	75 - 165 keV		5 - 2000 keV
Bkg:	24.7		29.2		229	
Sigma:	0.00		0.00		2.00	
LCR:	0		0		0	
Half Life(h	ours): 0.00		0.00			
Multiplier:	1.0000					
%CV Flag Li	mit: 0.00		0.00			
S#	A:CPM	A:%SIG	B:CPM	B:%SIG	C:CPM	C:%SIG
1.	0.0		0.0		0.0	
2	0.0		0.0		0.0	
3	0,0		0.0		0.0	
4	4.3	48.5	5.8	41.5	20.7	22.0
5	0.0		0.0		0.0	
6	2.3	66.5	10.8	30.4	25.7	19.7
7	2.3	66.5	0.8	112	0.0	
8	3,3	55.4	6.8	38.3	19.7	22.5
9	0.0		0.0		11.7	29.2
10	11.3	29.8	0.0		8.7	33.9
(24A)11	0.0		3.8	51.3	1.7	76.7

EDITDATA.DO7 Archived to C:\ARCH\ARCH07D.183 C:\DATA\P7DATA Copied to C:\DATA\ARCH07A.183

26 Feb 07 14:19:18 Packard Model 5003 COBRA SN: 424559

PROTOCOL # 7

SWIPES

CHESAPEAKE NUCLEAR

COUNT TIME 1 00 Minutes

COUNT	IME] 	LOO	Minute	S						
Window A			Window B			Window C					
LLD: ULD: EFF: Sample #			A:DPM	LLD: ULD: EFF:		keV keV %	8:DPM	LLD: ULD: EFF:	2000 70	 0.1004	
1 2 3 4	0 0 0 4	***************************************	0 0 5	an was the time and about the	0 0 6	non water water space to	0 0 7		C:CPM 0 0 0 21	 C:DPM 0 0 0 30	and their section

7 8 9 10 (24a) 11	2. 3 0 11 0	3 4 0 14 0	1. 7 0 0 4	1. 8 0 0	9 20 12 9	0 28 17 12
				·	2	2

20

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• *(***)

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Protocol# 2 - Triple Lable DPM.lsa

User: Default

Assay Definition-BI- B/00

Assay Description: CHESAPEAKE NUCLEAR

Assay Type: DPM (Triple) Report Name: Report1

Output Data Path: C:\Packard\Tricarb\Results\Default\Triple Lable DPM

Raw Results Path: C:\Packard\Tricarb\Results\Default\Triple Lable

DPM\20070227 2036.results

Assay File Name: C:\Packard\TriCarb\Assays\Triple Lable DPM.lsa

Count Conditions-

Nuclide: Triple Label

Quench Indicator: tSIE/AEC

External Std Terminator (sec): 0.5 2s%

Pre-Count Delay (min): 0.00

Quench Sets:

Low Energy: 3H-TOL-7-17-06 Mid Energy: 14C-TOL-07-17-06 High Energy: 32P-UG-02-28-05

Count Time (min): 5.00 Count Mode: Normal

Assay Count Cycles: 1

Repeat Sample Count: 1 #Vials/Sample: 1 Calculate % Reference: Off

Background Subtract: On - 1st Vial

Low CPM Threshold: Off 2 Sigma % Terminator: Off

UL Bkg Subtract Regions $_{
m LL}$ 1st Vial 0.0 12.0 A 12.0 156.0 1st Vial -В C 156.0 2000.0 1st Vial

Count Corrections-

Static Controller: On

Luminescence Correction: On Colored Samples: On Heterogeneity Monitor: n/a

Coincidence Time (nsec): 18 Delay Before Burst (nsec): 75

Half Life-

Half Life Correction: Off

. Units Reference Date Reference Time Regions Half Life

Α В

C

Cycle	1 Resul	lts								
s#	Time	CPMA	CPMB	CPMC	DPM1	DPM2	DPM3	SIS	tSIE	LUM
1	10.00	5	9	7	0	0	0	58.17	508.25	1
2	5.00	-1	3	1	-3	4	1	55.31	412.81	1
3	5.00	-0,	2	-2	-2	3	-2	24.80	341.97	1
4	5.00	0	1	-1	-0	2	-1	122.67	421.97	1
5	5.00	0	2	1	1	2	1	36.35	413.85	1
6	5.00	- O	1	-1	-1	2	-1	72.87	399.09	0
7	5.00	-0	-1	0	- 0	-1	0	0.00	446.69	2
8	5.00	1	5	1	0	5	1	47.45	425.83	2

22

9	5.00	3	2	-0	7	2	0	20.40		_
10	5.00	142	206	-0 -2	281	2 230	~0 -3	19.43	434.03	0
11	5.00	8	3	-1	16	230	-3 -1	30.40 18.35	409.51	0
12	5.00	51	50	0	110	52	0		473.41	1
13	5.00	1	3	-1	3	4	-2	28.44	407.61	0
14	5.00	-1	2	ō	-2	3	0	13.19	377.05	1
15	5.00	-0	4	0	-1	5		105.23	434.40	1
16	5.00	6	3	1	11	3	0	83.34	460.97	1
17	5.00	1	1	-2	1	1	1	33.28	523.38	1
18	5.00	-1	5	-1	-3	6	-2 -1	64.50	486.01	1
19	5.00	1	1	0	2	1	-1	5.34	349.32	1
20	5.00	2	ī	-0	4	1	-0	24.07	432.31	1
21	5.00	3	13	-1	4	15	-0 -1	0.00 52.15	438.26	0
22	5.00	1	1	1	2	1	1	78.77	474.39	1
23	5.00	3	ī	-0	6	1	-0	42.17	483.19 503.43	1
24	5.00	0	2	-1	-0	3	-1	33.62	494.81	1
25	5.00	2	2	-2	4	2	-2	49.92	494.81	1 1
26	5.00	-1	3	-1	-4	4	-1	113.45	467.97	
27	5.00	3	1	-2	8	1	-3	19.30	442.71	1
28	5.00	· i	-1	-1	. 2	-1	-3 -1	0.00	468.02	1
29	5.00	ī	ō	ō	2	-0	0	0.00	470.18	1
30	5.00	ō	4	-1	-1	5	-1	146.34	511.65	1
31	5.00	7	10	-1	12	11	-1	28.84	484.54	1 1
32	5.00	0	-0	ī	1	-1	1	0.00	417.74	6
33	5.00	2	4	-0	2	4	-0	51.23	450.98	. 1
34	5.00	1	2	-2	ī	3	-2	94.08	519.56	1
35	5.00	1	2	- 0	1	2	-0	57.04	472.85	1
36	5.00	1	3	-1	1	4	-1	87.59	502.18	1
37	5.00	1	3	-0	2	3	-0	54.79	446.92	ı
38	5.00	0	2	- 0	- 0	2	-0	0.00	438.78	1
39	5.00	-0	1.	- 0	-0	1	-0	84.06	389.94	1
40	5.00	62	46	0	124	47	Ö	23.22	476.51	0
41	5.00	29	21	-1	64	22	-1	21.87	407.33	Ö
42	5.00	2	3	0	2	3	0	51.82	521.94	1
43	5.00	1	1	2	2	0	3	0.00	435.47	Ō
44	5.00	0	-0	-1	1	0	-1	0.00	443.59	1
45	5.00	0	-2	0	2	-2	0	0.00	478.42	0
46	5.00	-0	6	1	-3	7	1	57.52	464.18	1
47	5.00	1	-1	-1	2	-1	-1	0.00	447.53	1
48	5.00	-1	2	0	-3	2	0	474.48	517.93	1
49	5.00	0	· 1	- 0	-0	1	-0	0.00	450.99	1
50	5.00	1	1	-2	2	1	-2		428.73	1
51	5.00	-1	1	-4	-2	3	-5	63.13	464.40	1
52	5.00	-1	3	-1	-4	4	-1	0.00	415.69	1
53	5.00	0	1	0	1	1	0	140.84	441.55	1
54	5.00	-1	2	-1	-3	3	-1	0.00	427.46	1
55	5.00	2	-0	0	4	-1	0	0.00	447.01	1
56	5.00	-2	1	1	-5	2	1	0.00	491.88	2
57	5.00	-1	2	-1	-2	3	-1	203.66	440.31	1
58	5.00	0	0	1	1	- 0	1	0.00	450.53	1
59	5.00	1	5	-3	1	7	-4	54.76	434.20	1
60	5.00	1	1	-1	2	1	-1	45.40	458.36	1
61	5.00	0	5	-1	-1	6	- 1	68.51	493.39	1
62	5.00	-0	2	-1	-1	3	-1	0.00	459.26	1
63	5.00	1	1	-1	2	2	-2	67.41	517.56	1
64	5.00	0	2	-1	-0	2	-1	13.34	441.37	1
65 66	5.00	0	2	-1	-0	3	-1	83.79	505.13	1
66 67	5.00	1	1	~ 0	1	1	-0	93.19	450.49	1
67 60	5.00	-0	2	-1	-1	3	-1	134.52	466.33	1
68 69	5.00 5.00	-0 1	11	-1 -0	-1	1	-1	0.00	440.87	1
70	5.00		-1 1	- 0 - 1	2	-2	-0	0.00	472.70	2
, 0	5.00	-1	1	-1	-2	1	-1	0.00	425.86	1

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71	5.00	0	2	-1	-1	3	-1	87.94	428.66	1
72	5.00	1	3	-1	0	4	-1	71.82	499.38	0
73	5.00	0	-1	-2	1	-1	-2	0.00	411.42	2
74	5.00	0	-2	-2	2	-3	-2	0.00	533.90	2
75	5.00	1	1	1	1	1	1	0.00	450.96	1
76	5.00	2	0	-1	4	0	-1	0.00	504.50	0
77	5.00	- 0	-2	3	-0	-3	4	0.00	447.94	2
78	5.00	1	0	-0	2	0	- 0	0.00	426.97	0
79	5.00	1	- 0	-1	3	- 0	-1	57.46	456.95	1
80	5.00	1	0	-0	3	- 0	-0	95.80	472.18	1
81	5.00	3	1	-1	5	2	-1	46.91	486.01	1
82	5.00	1	0	-1	3	0	-1	115.79	516.21	1
83	5.00	- 0	-1	2	-0	-1	3	0.00	459.62	2
84	5.00	1	1	-2	3	1	-2	0.00	448.96	3
85	5.00	-1	2	-3	-3	4	-4	73.83	449.59	1
86	5.00	-0	3	-1	-1	3	-1	152.77	472.92	3
87	5.00	-1	1	-1	-2	2	-1	19.66	464.82	1
88	5.00	0	4	-1	-0	5	-1	99.37	457.58	1
89	5.00	. 0	1	1	0	1	2	167.56	472.50	1
90	5.00	-0	4	2	-2	5	2	124.60	464.35	2
91	5.00	1	-0	1	2	- 0	1	0.00	546.07	1
92	5.00	-1	1	3	-3	1	3	0.00	478.54	3
93	5.00	2	1	1	5	0	1	9.28	472.60	2
94	5.00	1	2	2	1	2	2	74.00	453.37	1
95	5.00	0	1	-1	0	1	-1	16.18	451.53	3
96	5.00	3	0	2	6	-1	3	57.03	498.04	1
97	5.00	1	2	2	3	1	3	13.89	479.78	1
98	5.00	2	-1	-2	4	-1	-2	0.00	503.45	1
99	5.00	1	- 0	3	2	-2	4	0.00	448.46	3
100	5.00	0	1	-1	- 0	1	-1	137.03	452.35	3
101	5.00	0	3	-1	-1	4	-1	54.32	441.07	0

26 F@b 2007 14:42 Protocol #: 7

RSO. Inc.

SWIPES 18- 100B

Page #1 User : Lab Technician

CHESAPEAKE NUCLEAR

Count TimeLminutes: 1.00

Assay Type: Background Subtract :

: PM IPA 8kg

Outlier: %50111Up:

5.0 FLAG 0.90

%Spilldown: Screening:

0.00 956

REVIEWED BY:

0.0

	Window	1 A	Window B		Window 6	
Nuclide:	1-125	15 - 75	keV Co-57	75 - 165 keV	MAN 15	- 2000 keV
Bkg:	24.7		29.2		229	
ŝ≀gma:	0.00		0.00		2.00	
LCR:	ŷ		♦		Ĵ	
Half Life(hours): 0.00		0,00			
Multiplier	: 1.0000)				
%CV Flag L	imit: 0,00		0.00			
S#	A:CPM	A-%SIG	B:CPM	B: %516	C: CPM	C: %SI
1.	1.3	89.1	0.0		0.0	
2	0.3	196	5.8	41.5	1.7	76.
3	0.0		0.0		10.7	30,
4.2	0.0		1.3	74.5	0.0	
5	2 a 2	66.5	22.8	20.9	33.7	17.
6	0.0		2.8	59.8	39.7	15,
7	0.0		0.8	112	4.7	46.
3	5.3	43.6	5.8	38.3	15.7	25.
9	5.3	43.6	7.8	35.8	24.7	20,
10	10.3	31.2	5.8	41.5	38.7	16.
-1 - a						

EDITDATA.DO7 Archived to C:\ARCH\ARCHO7D.185 C:\DATA\P7DATA Copied to C:\DATA\ARCH07A.185

26 Feb 07 14:41:17 Packard Model 5003 COBRA SN: 424559

PROTOCOL # 7

SWIPES

(31B) 11

CHESAPFAKE NUCLEAR

0.0

COUNT	TIME	1,00	Minute		•					
	Jindow A			indow B				indow (
LLD: ULD: EFF: 3ample	15 75 79	keV keV	LLD: ULD: EFF:		keV keV		LLD: ULD: EFF:	15 2000 20	keV keV	
· · · · · · · · · · · · · · · · · · ·	A:CPM	n:DPM		B:CPM		B:DPM		L:CPM		C:OPM
1	1		the second second second design to	· · · · · · · · · · · · · · · · · · ·	All appropriate the control	0	not f am et bught false, faculti falser i	······································	per 1800 til versi 1980 til	· · · · · · · · · · · · · · · · · · ·
<u></u>	÷.	Ç		$\ell_{\mathcal{D}}^{*}$		7		مىند		2
3	0	0		9		•)		t. i.		15
4	O	O		in the second		1.7 ₆ 80.7		0		Ģ
Ş		3		<i>2</i> 3		2.7		3.4		48

7 8 9 10 (318) 11	5 5 10 0	© 7 7 13 0	ι 7 8 6 0	1 8 9 7 0	5 16 25 39 0	7 22 35 55
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Protocol# 1 - Triple Lable DPM.lsa

NIH

Assay Definition-C1-C30

Assay Description: CHESAPEAKE NUCLEAR

Assay Type: DPM (Triple) Report Name: Report1

Output Data Path: C:\Packard\Tricarb\Results\NIH\Triple Lable DPM

Raw Results Path: C:\Packard\Tricarb\Results\NIH\Triple Lable DPM\20070228_0727.results

Assay File Name: C:\Packard\TriCarb\Assays\Triple Lable DPM.lsa

Count Conditions-

Nuclide: Triple Label

Ouench Indicator: tSIE/AEC

External Std Terminator (sec): 0.5 2s%

Pre-Count Delay (min): 0.00

Quench Sets:

Low Energy: 3H-TOL-7-17-06 Mid Energy: 14C-TOL-07-17-06 High Energy: 32P-UG-02-28-05

Count Time (min): 5.00 Count Mode: Normal

Assay Count Cycles: 1

Repeat Sample Count: 1 #Vials/Sample: 1 Calculate % Reference: Off

Background Subtract: On - 1st Vial

Low CPM Threshold: Off 2 Sigma % Terminator: Off

Regions $_{
m LL}$ UL Bkg Subtract 0.0 12.0 1st Vial Α 1st Vial В 12.0 156.0 \mathbf{C} 2000.0 1st Vial 156.0

Count Corrections-

Static Controller: On Colored Samples: On Coincidence Time (nsec): 18

Luminescence Correction: On Heterogeneity Monitor: n/a Delay Before Burst (nsec): 75

Half Life-

Half Life Correction: Off

Regions Half Life Units Reference Date Reference Time Α

В

C

Cycle	1 Resul	.ts								
s#	Time	CPMA	CPMB	CPMC	DPM1	DPM2	DPM3	SIS	tSIE	LUM
1	10.00	5	8	6	0	0	0	57.03	557.01	1
2	5.00	. 0	1	0	-0	1	0	94.29	462.46	1
3	5.00	0	3	1	-0	4	2	23.18	445.34	1
4	5.00	-1	5	2	-3	6	3	68.50	498.42	2
5	5.00	0	0	-1	0	1	-1	67.14	536.01	1
6	5.00	-1	2	1.	3	2	2	165.05	401.30	3
7	5.00	-1	1	2	-4_	1.	2	0.00	453.80	2
8	5.00	0	2	- 0	0	3	-0	4.01	466.14	1
9	5.00	0	2	1	0	3	1	49.20	447.97	0

22	9	
<i>-</i>		

10	5.00	-1	3	-0	-2	3	-0	14.28	435.11	0
11	5.00	-1	0	- 0	-3	1	-0	0.00	467.48	2
12	5.00	2	1	1	4	1	1	68.81	496.99	1
13	5.00	2	3	2	4	3	2	24.20	494.78	1
14	5.00	-2	2	0	-4	3	0	291.31	485.55	1
15	5.00	- 0	3	-1	-1	4	-1	98.21	526.58	1
16	5.00	0	1	2	0	1	3	100.05	473.52	1
17	5.00	-1	3	1	-3	4	1	15.83	409.92	1
18	5.00	0	3	0	-0	4	0	43.64	419.27	1
19	5.00	0	2	1	-0	3	2	88.34	508.49	1
20	5.00	-2	4	1	-6	5	1	109.70	469.81	1
21	5.00	1	1	1	1.	1	1	26.30	493.88	0
22	5.00	- 0	5	2	-2	5	2	81.71	457.87	1
23	5.00	- 0	3	1	-2	3	1	82.78	485.97	1
24	5.00	0	2	0	0	2	0	131.77	525.48	1
25	5.00	-0	0	1	- 0	- 0	2	0.00	365.34	1
26	5.00	- 0	4	0	-2	4	0	60.47	400.52	1
27	5.00	0	8	2	-2	10	2	49.10	436.35	1
28	5.00	4	15	1	5	17	1	51.71	443.39	1
29	5.00	12	20	0	21	23	-0	37.18	451.32	0
30	5.00	124	176	0	226	195	-1	37.13	474.19	0
31	5.00	-0	4	0	-1	4	0	56.09	451.11	1

26 Feb 2007 14:36 Protocol #: 7

RSO, Inc.

SWIPES 1c-30C Page #1

User : Lab Technician

CHESAPEAKE NUCLEAR

Count Time(minutes): Assay Type:

1.00

Background Subtract :

CPM IPA Bkg

Outlier:

5.0 FLAG

%Spillup: %Spilldown: 0.00 0.00

Screening:

OFF

REVIEWED BY:

15 - 2000 keV

Window A Window C MAN

Nuclide: Bkg: Sigma:

LCR:

I-125 24.7

15 - 75 keV

0.00 0

Half Life(hours): 0.00 Multiplier: 1,0000 %CV Flag Limit:

0.00

Window B 75 - 165 keV Co-57 29.2 0.00 0

0.00

0.00

B:CPM

2.8

0.0

0.8

5# A:CPM 1 0.0

2 0.0 3 0.0 A:%SIG

B:%SIG 59.8

112

229

2.00

0

C:CPM C:%SIG

0.0 0.0

0.0

EDITDATA.DO7 Archived to C:\ARCH\ARCH07D.184 C:\DATA\P7DATA Copied to C:\DATA\ARCH07A.184

26 Feb 07 14:35:40

Packard Model 5003 COBRA SN: 424559

PROTOCOL #

SWIPES

CHESAPE COUNT	EAKE NUG TIME	CLEAR 1.00	Minut	ප ස							
Wi	indow A	AND MAKE SEAL WATER SAME SAME STATES THE SEAL SEAL SAME	W.	indow B							
LLD:	1 5.	- keV	LLD:	76	- keV		LLD:	4 6	- keV		
ULD:		keV	ULD:	165			ULD:	2000			
EFF:	79		EFF:	85			EFF:	70			
Sample											
#	A:CPM	A:DPM		B:CPM		B:DPM		C:CPM		C:DPM	
1	0	0		3		3		0	~ ~ ~ ~ ~ ~	0	no Valle VIII.
2	0	0		0		0		0		0	
3	0	0		1		1		0		0	

Attachment 6.0 Follow-up Smear Survey Results



Radiation Service Organization

March 27, 2007

Chesapeake Nuclear Attn: Stewart Bland 788 Sonne Dr. Annapolis, MD 21401

Dear Mr. Bland.

Enclosed please find the results for the wipe tests received on March 26, 2007. The wipe tests were analyzed using Liquid Scintillation, Gamma Counters and Gamma Spectroscopy. An individual data print out for each analysis process is attached for your review. The only elevated activity indicated on the analysis reports were as follows:

Wipe test group 3C to 67C (37 wipe tests) found 3 wipe tests exceeding 100 and 2 wipe tests exceeding 1,000 dpm. Please review attached beta-gamma LSC data results for activity concentrations.

Analysis of swabs 5, 6 & 8 found no activity exceeding 10 dpm. Please review attached beta-gamma LSC data results for activity concentrations.

Wipe tests were Gamma counted and analysis results indicated all activity levels below 50 dpm. Please review attached gamma data results for activity concentrations.

Gamma spec analysis of scrapings received within 7 small bags found no spectrum outside of normal background.

If you have any questions please do not hesitate to call me at (301) 953-2482 ext. 305 or by e-mail james.dean@rsoinc.com.

Sincerely,

James W. Dean

ames W. Doa

Manager, Radiation Safety Services - Radiation Safety Officer

Enclosure

CHAIN-OF-CUSTODY RECORD

										Spec						SA	AMPL	E PAI	RAMI	ETER								
PROJECT OFFI	1341cm 1310m		NO			T O T A L #		1 Scin		Tatile gamen					The state of the s										ANY CONTRACTOR OF THE PROPERTY			
DATE SAMPLED	FIELD IDENTIFICATION NUMBER	C of C NUMBER	SAMPLE TYPE	COMP	G R A B			Liguid	٠	Qualitative																	THE PROPERTY OF THE PROPERTY O	
コーンンクフ	31c-676 1133 113B 5,6,8 B4		Smer			36		V																				
3-22-07	1133 1138		X Vapping			7				V	4		. Ce	111	c#	ve	4	:4	8-	Sp	Ď	an	مام	215				
3-22-67	5,6,8 BU		Ut 1 sma	١													1	_		•								
3-22-07	5,6,8		Swab			3		\checkmark																				
																												L
		,																								_		
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																						•	. 1		3	1 1	1	7

DEMARKS		
REMARKS		

Page 1 of 2

37 NOT 36 RE

26 Mar 2007 14:12 RSO, Inc. Protocol #: 7

SWIPES

Page #1 User : Lab Technician

CHESAPEARE NUCLEAR

Count limetminutes: Assay Type.

1.00 (PM

Background Subtract -Outlier:

IPA Bkg 5.0 FLAG

&Spilluc:

0.00

&Spilldown: Screening:

0.00 OFF

REVIEWED BY:

	Window A		Window 8		Window C	
Nuclide:	I-125	15 - 75 keV	Co-57	75 - 165 kel	MAN	15 - 2000 keV
9kg:	23.1		26.7		210	
Sigma:	0.00		0.00		2.00	
LCR:	ý.		0		0	
Half Life(hours):	0.00		0.00			
Multiplier:	1.0000					
\$CV Flag Limit:	0.00		0.00			•

5#	A:CPM	A:%SIG	8:CPM	B:%SIG	C:CPM	6:3516
1	1.4	72.2	0.0		o.o	
	9.9	31.8	2.3	55.4	6.2	40
3	3.9	50.5	3.3	54.7	15.2	25.6
4	0.0		3.3	54.7	20.2	22.2
ε,	0.0		3.3	54.7	21.2	21.7
fo.	11.9	29.0	6.3	39.7	41 2	15.6
7	0.0	, · ·	0.3	171	6.2	40.2

EDITDATA.DOZ Archived to C:\ARCH\ARCHO/D.191 C:NDATANPZDATA Copied to C:NDATANARCHOZA.191

26 Mar 07 - 14:10:59 - Packard Model 5003 CUBRA 5N: 424559

PROTOCOL # /

SWIPES

W	indow A		Wi	ndow 8			W	rudom (
LO: ILU: IFF:				75 165 85	k÷V			15 2000 20	keV	
elqma #	A I CPM	A:DPM		ВЕСРМ		B:OFM		+ :!;{' [†] M		i, i DHM
	man ang tag at a sala tang ning ning ni B		aller after common til 10 m	م مستند مد مد مد سد - في	a to or a mark o		the winds of the second	1.3		
,	(3)	1				3		25.		* ; *
3	• 1	٠,		3		4		15.		J. 1
4	Ç	<i>(</i>)		3		4		$\mathcal{J}C$		29
c,	Ü	٠j		j.		.4		. 1		.10
	1.5	1.5		F ₂		7		4.1		Circle
	0	Ų)		1		1		

NIH

Page # 1 User: NIH

Assay Definition-

Assay Description: CHEASAPEAKE NUCLEAR

Assay Type: DPM (Triple) Report Name: Report1

Output Data Path: C:\Packard\Tricarb\Results\NIH\Triple Lable DPM

Raw Results Path: C:\Packard\Tricarb\Results\NIH\Triple Lable DPM\20070326 1554.results

Assay File Name: C:\Packard\TriCarb\Assays\Triple Lable DPM.lsa

Count Conditions-

Nuclide: Triple Label

Quench Indicator: tSIE/AEC

External Std Terminator (sec): 0.5 2s%

Pre-Count Delay (min): 0.00

Quench Sets:

Low Energy: 3H-TOL-7-17-06 Mid Energy: 14C-TOL-07-17-06 High Energy: 32P-UG-02-28-05

Count Time (min): 5.00 Count Mode: Normal

Assay Count Cycles: 1 Repeat Sample Count: 1 #Vials/Sample: 1 Calculate % Reference: Off

Background Subtract: On - 1st Vial

Low CPM Threshold: Off 2 Sigma % Terminator: Off

Regions	LL	\mathtt{UL}	Bkg	Sub	tract
A	0.0	12.0		lst	Vial
В	12.0	156.0		1st	Vial
С	156.0	2000.0		lst	Vial

Count Corrections-

Static Controller: On Luminescence Correction: On Colored Samples: On Heterogeneity Monitor: n/a Coincidence Time (nsec): 18 Delay Before Burst (nsec): 75

Half Life-

C

Half Life Correction: Off

Reference Date Regions Half Life Units Reference Time Α В

Cycle 1 Results

CACTE	T Kesul	Co								
S#	Time	CPMA	CPMB	CPMC	DPM1	DPM2	DPM3	SIS	tSIE	LUM
bkg-1	10.00	6	11	6	0	0	0	68.71	527.52	2
# 1 2	5.00	1	~ 2	3	2	-3	3	0.00	490.83	4
3	5.00	1	~ 2	-1	4	-2	-1	0.00	497.42	4
4	5.00	0	1	1	0	1	.2	0.00	481.85	2
5	5.00	1	0	2	2	- 0	3	0.00	505.94	2
6	5.00	0	0	1	1	- 0	1	0.00	497.94	2
7	5.00	1	7	3	0	7	4	47.92	456.63	2
8	5.00	1	2	1	1	3	2	0.00	502.96	2
9	5.00	0	4	3	- 0	4	3	17.25	464.03	2

NIH

User: NIH

10	5.00	0	1	2	0	1	2	0.00	470.50	2
11	5.00	-1	1	1	-2	2	1	0.00	473.34	3
12	5.00	0	2	2	- 0	2	2	0.00	422.26	2
13	5.00	-1	-1	5	- 2	- 2	6	0.00	498.13	3
14	5.00	2426	4726	5	3998	5389	-16	41.30	482.06	0
15	5.00	100	162	3	168	182	3	41.74	518.21	0
16	5.00	129	168	3	237	184	3	35.88	481.58	0
17	5.00	5	5	2	11	5	3	4.24	408.48	1
18	5.00	0	4	2	-1	5	2	40.89	407.03	2
19	5.00	9	12	4	16	12	4	23.53	457.51	1
20	5.00	649	1164	1	1147	1318	- 3	37.46	447.54	0
21	5.00	- 0	3	2	-2	3	2	0.00	420.95	1
22	5.00	3	1	1	7	1	2	0.00	446.18	2
23	5.00	1	5	- 0	- 0	6	- 0	45.66	432.58	2
24	5.00	-1	1	1	-2	1	1	0.00	397.77	1
25	5.00	1	1	3	3	0	3	0.00	464.81	2
26	5.00	9	3	-1	18	3	-1	8.11	490.25	1
27	5.00	14	13	-2	30	14	-2	12.92	395.32	1
28	5.00	1	0	2	3	-0	2	0.00	496.22	2
29	5.00	26	2	1	63	-2	1	0.00	408.92	1
30	5.00	3	3	0	5	4	0	0.00	487.01	2
31	5.00	6	2	1	12	1	1	0.00	488.62	2
32	5.00	5	0	2	10	-1	2	0.00	500.78	2
33	5.00	24	9	-1	51	8	-1	14.71	485.19	1
34	5.00	44	22	1	107	20	1	13.43	369.64	0
35	5.00	10	5	-2	20	6	-2	22.25	521.84	1
36	5.00	4	3	1	7	3	2	31.37	487.86	3
37	5.00	17	10	3	32	9	3	18.44	541.92	1
#57 38	5.00	2	2	2	4	2	2	1.42	507.76	2
#5 39	5.00	1	-3	0	4	-4	0	0.00	535.89	3
40	5.00	3	3	3	6	3	4	29.67	515.97	2
7 41	5.00	3	-2	3	6	-4	3	0.00	524.08	2

****** GAMMA SPECTRUM ANALYSIS *****

Report Generated On : 3/26/07 12:30:12 PM

Sample Title : Soil

Spectrum Description

Sample Identification : CHESAPEAKE NUC

Sample Type : Sol

Sample Geometry : Marinelli Beaker

Peak Locate Threshold : 3.00

Peak Locate Range (in channels): 50 - 8192
Peak Area Range (in channels): 50 - 8192
Identification Energy Tolerance: 1.000 keV

Sample Size : 1.000E+000 Grams

Sample Taken On : 3/26/07 12:15:06 PM Acquisition Started : 3/26/07 12:15:06 PM

Live Time : 900.0 seconds Real Time : 900.1 seconds

Energy Calibration Used Done On : 1/25/07 Efficiency Calibration Used Done On : 1/23/07

I put these 7 small bags of scrappings into a beaker of counted. Let me know if you need additional info.

K.h. 3/26/07

****************************** ***** NUCLIDE IDENTIFICATION REPORT *****

Sample Title: Soil

Nuclide Library Used: C:\GENIE2K\CAMFILES\NORMPLUS.NLB

..... IDENTIFIED NUCLIDES

Nuclide Id Energy Yield Activity Activity
Name Confidence (keV) (%) (pCi/Gram) Uncertainty

Energy Tolerance: 1.000 keV

Nuclide confidence index threshold = 0.30

Errors quoted at 2.000 sigma

^{* =} Energy line found in the spectrum.
@ = Energy line not used for Weighted Mean Activity

25.45

INTERFERENCE CORRECTED REPORT

Nuclide Wt mean Wt mean Nuclide Id Activity Activity Confidence (pCi/Gram) Name Uncertainty

? = nuclide is part of an undetermined solution

X = nuclide rejected by the interference analysis

@ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 2.000 sigma

***** UNIDENTIFIED PEAKS ********

Peak Locate Performed on: 3/26/07 12:30:11 PM

Peak Locate From Channel: 50 Peak Locate To Channel: 8192

Peak Peak Size in Energy Peak CPS Counts per Second % Uncertainty No. (keV)

26.35 1.5569E-001 1

M = First peak in a multiplet region m = Other peak in a multiplet region

F = Fitted singlet

Errors quoted at 2.000 sigma

Attachment 7.0 Final Status Survey Smear Results



Radiation Service Organization

July 10, 2007

Chesapeake Nuclear Attn: Stewart Bland 788 Sonne Dr. Annapolis, MD 21401

Dear Mr. Bland,

Enclosed please find the results of the 10 wipe tests received on July 2, 2007. The wipe tests were analyzed using Liquid Scintillation (LSC) counting technology. An LSC individual data results print out denoting each analysis result is attached for your review. The results of the first sample are for background determination. The wipe test analysis begins with sample location #2. Wipe test results were background deducted presenting net results. Reported analytical data indicates all activity levels below 50 dpm.

If you have any questions please do not hesitate to call me at (301) 953-2482 ext. 305 or by e-mail james.dean@rsoinc.com.

Sincerely,

James W. Dean

Manager, Radiation Safety Services - Radiation Safety Officer

Enclosure

July 2, 2007

Stewart Bland Chesapeake Nuclear Services, Inc. 788 Sonne Dr. Annapolis, MD 21401 USA

Dear Stewart:

The ten swipes delivered to RSO Inc. were found to be < 50dpm. The final results will be sent to you with the invoice.

Sincerely,

Mr. Richard Emmons Laboratory Technician Protocol# 2 - Triple Lable DPM.lsa

User: Default

REVIEWED BY:

Assay Definition-

Assay Description: CHESAPEAKE NUCLEAR

Assay Type: DPM (Triple) Report Name: Report1

Output Data Path: C:\Packard\Tricarb\Results\Default\Triple Lable DPM Raw Results Path: C:\Packard\Tricarb\Results\Default\Triple Lable

DPM\20070702 1238.results

Assay File Name: C:\Packard\TriCarb\Assays\Triple Lable DPM.lsa

Count Conditions-

Nuclide: Triple Label

Quench Indicator: tSIE/AEC

External Std Terminator (sec): 0.5 2s%

Pre-Count Delay (min): 0.00

Quench Sets:

Low Energy: 3H-TOL-7-17-06 Mid Energy: 14C-TOL-07-17-06 High Energy: 32P-UG-02-28-05

Count Time (min): 1.00 Count Mode: Normal

Assay Count Cycles: 1 Repeat Sample Count: 1 #Vials/Sample: 1 Calculate % Reference: Off

Background Subtract: On - 1st Vial

Low CPM Threshold: Off 2 Sigma % Terminator: Off

Regions	${ m LL}$	\mathtt{UL}	Bkg	Subtract
A	0.0	12.0		1st Vial
В	12.0	156.0		1st Vial
C	156.0	2000.0		1st Vial

Count Corrections-

Luminescence Correction: On Static Controller: On Colored Samples: On Heterogeneity Monitor: n/a Coincidence Time (nsec): 18 Delay Before Burst (nsec): 75

Half Life-

Half Life Correction: Off

Units Reference Date Reference Time Regions Half Life A В С

Cycle	1	Results
-------	---	---------

S#	Time 10.00	CPMA 7	CPMB	CPMC	DPM1	DPM2	DPM3	SIS	tSIE	LUM
_	10.00	7	_				2	0.10	(U I II	TION
1		,	8	8	0	0	0	53.73	524.81	2
2	1.00	8	21	-2	10	25	-3	57.54	556.93	0
3	1.00	1	6	-1	- 1	7	-2	101.77	552.25	0
4	1.00	3	3	- 2	5	3	-3	71.39	556.11	0
5	1.00	5	5	-2	8	6	-3	31.53	544.69	0
6	1.00	-2	2	- 3	-5	4	-4	587.91	480.71	0
7	1.00	-3	1	5	-8	1	6	0.00	424.99	0
8	1.00	6	10	- 0	9	12	- 0	33.38	563.77	0

7/2/07 1				Quanta	Smart	(TM) -	1.31 -	Serial#	424558		Page # 2
Protecol#	2 -	Triple	Lable	DPM.lsa						Use	r: Default
9	1.0	0 :	14	6	- 4	27	6	-5	22.48	529.99	0
10	1.0		4	2	-2	7	2	_	64.25	531.70	0
1 1	1 0	٠.	. o	E	_ 1	. 6	6	2	120 70	E 47 00	0

20 Hoc 107

Attachment 8.0 Radioactive Waste Shipment Manifest

WASTE I SHIPPIN	UNIFORM LOW-LEVEL RADIOACTIVE WASTE MANIFEST SHIPPING PAPER EMERGENCY TELEPHONE NUMBER (Include Aree Code) 1-800-424-9300			R — NAME AND FACILITY I Center I) Center I) Center VA 23867	SHIPPER I.D. NUM NA COLLECTOR PROCESSOR GENERATOR (Specify) M TELEPHONE NUM	ТУРЕ	7. FORM 540 AND 540A FORM 541 AND 541A FORM 542 AND 542A FORM 542 AND 542A 9. CONSIGNEE - Name I RSO, Inc. 5204 Minnick Roa	MATION and Facility	1 OF 1 PAGE(S) 1 PAGE(S) None PAGE(S) None PAGE(S)	8. MANIFEST NUMBER (Use this number or pages) 15882 CONTACT David Wellner TELEPHONE				
ORGANIZATION Chemitrec			Joe Mod	on R - Name and Address		(Include Area Code (610)873-4514 EPA I.D. NUMBER	,	Laurel, MD 20707	dycondigate acknow) Medging waste receipt	(Include Area Code) (301)953-2482 DATE			
2. IS THIS AN "EXCLUSIVE USE" SHIPMENT? YES NO	3. TOTAL NUMBER OF PACKAGES IDENTIFIED ON THIS MANIFEST	1	RSO, Inc. 5204 Mirmi Laurei., Mi	20707	uck #: 96233 eiler #: N/A	MDD-05-927-9669 SHIPPING DATE 06/28/2007	Ti	This is to certify that the herein-name (materials are properly classified, described, packaged, marked, and are in proper condition for transportation according to the applicable regulations of the Department of Trans.						
4. DOES EPA REGULATED VASTE REQUIRING A MANIFEST ACCOMPANY THIS SHIPMENT?	EPA MANIFEST NUMBER		CONTACT David We SIGNATURE		władaina waste receiat	TELEPHONE (Include Area Code (301)963-2482 DATE	Area Code) Installed Continues that the meterials are classified and disposal as described in acco				ed, packaged, marked, and labeled and are in proper condition for ordance with the requirements of 10 CFR Parts 20 and 61, or equivalent			
If "Yes," provide Manifest Number ====>			Jou	Strain		628-0		Trysh		MD R. SO	1	6/28/07		
and any additional informati	(Including proper shipping name, hazard class, UN ID number, and any additional information) DOT LABEL TRADIDACTIVE Coactive material, excepted package-limited quantity of NA			PHYSICAL AND CHEMICAL FORM		15. INDIVIDUAL RADIONUCLIDES	3	18. TOTAL PACKAGE ACTIVITY MBq mCi		17. LSA/SCO CLASS	18, TOTAL WEIGHT OR VOLUME (Use appropriate units)	19. IDENTIFICATION NUMBER OF PACKAGE		
Radioactive material, excepted package- material, 7, UN 2910	limited quantity of	NA	NA .	Solid Labware, Tiles	C-14	H-3		3.3337E+01	9.0100E-01	NA	85 LBS; 4.1 FT3 211	56161		
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FOR CONSIGNEE USE ONLY				20.			····			1	<u></u>	L		
TENNESSEE "LICENSE FOR DELIVERY" NO				10	, Cho	dhar	, A	VA contac Ext. 3528	. /					
SOUTH CAROLINA TRANSPORT PERMIT NO		·			757:	722-99	161	Ext. 3520	•					
US ECOLOGY GENERATOR NO					.5 / /		. •	0						
US ECOLOGY PERMIT NO														
FORM 540 (10-96)											· · · · · · · · · · · · · · · · · · ·			

FORM 541									1 MA	NIFEST TOTALS						T			
FORM 541		Radia	tion Service C	rganization	, Inc. NUMBI PACK	ER OF	T WASTE	NET WASTE	1, 180		IAL NUC	LEAR MATERIA	L (grams)		_	2. M/	ANIFEST NU	MBER 5882	
					DISPO	DSAL V	OLUME	WEIGHT	U-233	Ü	235	P	'n	1	Total	├ ──		2002	
UNIF	ORM LOW-LEVE		ACTIVE			m3	0.1161	kg 38.555	4		IP	N	n		NP	3. PA	AGE 1 (OF 1 P	PAGE(S)
	WASTE MAN	NIFEST			1 1	n3	4.1000	ь 85.000							NP		IIPPER NAV Medical Cen		
	CONTAINER AND WAST	E DESCRIPTI	ON			r		1	ACTIVITY					-	SOURCE] '^'	moulcal Cell	rei	
Additional Nuclear	Regulatory Commission (N	IRC) Requiren	nents for Contr	ol, Transfer	and	ALL NUC		TRITIUM	C-14		÷89 IP	N N	29	(Aug)	(kg)	SHIPI	MENT ID NU	MRER	
	Disposal of Rad	-			MBq mCi	3.3337 9.0100		3.7000E-02 1.0000E-03	3.3300E+0		IP	N		(kg)	NA NA	NA NA	MENT ID NO	WOC/C	
	DISPOSA	L CONTAINER DE	SCRIPTION		mu	9.0100	T	1.0000E-03) 3.0000E-C	·		ON FOR EACH W		,		1 ,			16. WASTI
5.	6. CONTAINER DESCRIPTION	7.	8.	9.	10.			PHYSIC	AL DESCRIPTION		14.	CHEMICAL DES		15.	RADIOLOGI	CAL DESC	RIPTION		CLASSIFI
CONTAINER IDENTIFICATION NUMBER/ GENERATOR ID NUMBER	(See Note 1) PROCESS REQUESTED (See Note 1A) BURIAL/DISPOSITION (See Note 2A)	VOLUME (m3)	WASTE AND CONTAINER WEIGHT (kg) (b)	SURFACE RADIATION LEVEL (mSv/hr) (mrem/hr)	CONTA (MBq/	RFACE MINATION 100 cm2) 100cm2)	l	WASTE SCRIPTOR See Note 2)	WASTE VOLUME(S) IN CONTAINER (m3)	13. SOLIDIFICATION STABILIZATION MEDIA (See Note 3)	OF CHE	EMICAL FORM/ LATING AGENT	WEIGHT % CHELATING AGENT IF > 0.1%			AL; OR CO	NTAINER TOTAL LIDE PERCENT	LACTIVITY	AS-Class A Stable AU-Class A Unstable B-Class B C-Class C
*********	ļ <u> </u>		()		A	GAMMA	33		(FT3)	NA NA	Lab	ware, Tiles/NP	NP	C-14	DIONUCLIDES		MBq 3.3300E+01	mCi 9.0000E-01	+-AU
56161/VAMC	C E	9.1161	38,5654	2,0000E-04	<1.6700E-06	<1,6700E-0			0,1161		-	, rausiu		H-3 Subto					
		4.1000	85.0000	2.0000E-02	<1.0000E+02	<1.0000E+0	2		4.1000					Total	<u> </u>		3.3337E+01		1
Shipment Totals		0.1161	38.6654													-	3.3337E+01	9.0100E-01	
		4.1000	88.0000																
							1												
							ļ				-								
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Note 1: Container Description Codes. For containers/ weste requiring disposed in approved structural over- packs the numerical code must be followed by "-OP." 1. Wooden Box or Crate 9. Demineralizer 10. Gas Cylinder 10. Busk, Unpackaged Waste 4. Metal Drum or Pail 12. Unpackaged Components 5. Metal Tank or Liner 13. High Integrity Container 6. Concrete Tank or Liner 19. Other. Describe in Item 6, 7, Polyethinen Tank or Liner or additional page 7. Fiberglass Tank or Liner 6. Control of Cont					coel 2 erator Ash 3 sous Liquid 3 Media 3 nanical Filter 3 or State 3	9. Demolition F D. Cation Ion-e 1. Anion Ion-e	tubble schange Medi change Medi on-exchange id Equipment id (except oil r Labware ce/Device	38. Evapora Cono is 39. Compas Media 40. Noncom 41. Animal I 42. Biologic animal 43. Autivate 59. Other. I	pactible Tresh Carcess at Material (except al carcess)	B E R PR	Barnwell \ Envirocan Richland,		ant		to three which disposal site must be folio must also be Solidification 90. Cement 91. Concrete (encapeula 92. Biturnen	th predomic structural wed by "-8 identified i 94. 99. ation)	inate by volume. stability require S." and the medi	•	ting erical code and name

Enclosure 2

Additional Information Provided by Permittee to the National Health Physics Program

The National Health Physics Program (NHPP) issued a request for information (RFI) to the permittee based on an NHPP review of the report included as **Enclosure 1**. This enclosure (**Enclosure 2**) documents that request and the permittee's response. Information referenced as *attached* in permittee responses are provided at the end of this enclosure.

NHPP Request Item 1

Attachment 3 of the report only includes instrument calibration records for two Ludlum 43-68 probes. Please provide calibration records (showing efficiencies traceable to NIST) for the other instruments used: Ludlum Model 43-37-1, Ludlum Model 19, Liquid Scintillation Counters (wipes), and Gamma Counters (wipes).

Permittee Response to Item 1

The requested calibration records are **attached**. Please note the documentation of efficiency for the Ludlum 43-68 detector with a different cable was reported by email from RSO, Inc.; a complete re-calibration was not deemed necessary, but we did re-establish the efficiency for C-14.

NHPP Request Item 2

Wipe data (Attachments 5.0 and 6.0) need better identification. Please provide Attachments 5.0 and 6.0 with sample results that are more clearly labeled with the sample field IDs.

Permittee Response to Item 2

The number designation used by RSO, Inc., for the smear analysis reflects an incremental increase by one (1) from the number designation denoted on the survey forms. The reason for this is that the first sample designation (i.e., analysis #1) is used for establishing the system background. A cross comparison between the RSO, Inc., smear analysis numbers and those as designated on the survey forms are **attached [as Enclosure 3]**.

NHPP Request Item 3

Provide additional discussion on how/where background was established for the various surface scanning detection instruments and surveyed media. The report provides different background levels for different detector probes and different media: "sealed concrete," "ceramic tile," and "8-inch tile."

Permittee Response to Item 3

The backgrounds for the various survey media that composed the facility flooring were taken in non-impacted areas of the building. This approach is allowed by MARSSIM, where it may be difficult to find locations/facilities away from the facility under evaluation for obtaining suitable backgrounds. Additionally, when evaluating the identified elevated areas, additional consideration was given to observed increase in relative instrument response. For example, for the decontamination sink in Room 113B the left side of the surface was found to be not impacted; i.e., levels consistent with those for other non-impacted areas throughout the facility. Also once the right side of the lab table surface was broken up, we verified the background on the bottom surface of a slab that was also non-impacted. For the Lab table surface in Room 113C, the right side of the sink table was not impacted, so that was used as an indication of background for the impacted left-side surface.

NHPP Request Item 4

Provide the height above floor at which the exposure rate measurements (using Ludlum Model 19 meter) were made (1 meter is normally used). Also, the report does not include any discussion of exposure rate results in Rooms 113A, 113C, and 113D; please provide this information.

Permittee Response to Item 4

There were not chest-height gamma dose rates taken in the facility. Review of the detailed radionuclide inventory maintained for Building 72 by the VAHA RSO and his staff show no use or storage of loose gamma-emitting substances that would still be present in the facility (short-lived I-131 was used in Building 72). The gamma measurements made were all near surfaces that would most likely have exhibited long-lived gamma activity had any actually been used (e.g., hood Sink drains in the Rooms 113 Lab Complex and any other area where small or large lead pigs were found in source storage drawer). No indications of elevated gamma-emitting radionuclides were found in any part of Building 72. These surveys were precautionary in nature since one of the abandoned pigs in Room 113D was marked "Mn-54" but not as part of an official label.

NHPP Request Item 5

Comments in Attachment 1 for Room 137 mention standing liquid material in a 30-gallon drum marked as "radioactive material." Describe what was done with this material. (Has it been removed from the building/properly disposed?)

Permittee Response to Item 5

The 30-gallon drum with the standing liquid was sampled (wetted smear) during the initial survey evolution and found to be non-contaminated. Upon return for the follow-up survey, the liquid had evaporated and no sediment was observed in the bottom of the drum. The "Radioactive" Symbol on the drum was removed, as were other radioactive symbols throughout the facility.

NHPP Request Item 6

The report mentions an inaccessible area adjacent to Room 137. The inaccessible area is closed off by a wall and may have suffered fire damage in the past. No surveys were able to be performed in the area, and the radiological status of this area is unknown. Provide justification for not surveying this area for unrestricted release (i.e., certify no radioactive materials were ever used in the area) or provide survey data for the area.

Permittee Response to Item 6

The Head of Research Service [at permittee facility] has confirmed that radioactive materials were never used in the inaccessible area adjacent to Room 137.

Reference: Response to Item 1

Enclosure 2

RSO, Inc. P.O. Bex 1450 Laurel, MD 20725 (301) 953-2482

Certificate of Calibration

RSO Job No. 6994

ISSUED TO: Chesapeake Nuclear Services 788 Sonne Dr. Annapolis, MD 21401

INSTRUMENT: CODLUM MODEL: 2350-1 TYPE: DATA LOGGER

SN: 129408

CONTACT: Stewart Bland PHONE: (410) 266-9174

PO NO: Credit Card

RSO, Inc. certifies that on 01/26/2007 the above described instrument was calibrated using a radioactive source to determine the efficiency for a specific radionuclide(s) and using electronically generated pulse for the linearity. Pulsed using Ludlum 500-2, S/N 159110.

The results are tabulated below. Calibration is traccable to NIST.

Calibration Data

	RANGE	EXPECTED	OBSER	VED	C.E.					
AUTO		100	102	cpm	0.98					
		400	400	com	1 00					
RANGING		1000	1000	cpm	1.60					
		4000	4000	Civin	1.00					
SCALE		19000	10000	epm	1.00					
		40000	39900	cpm	1,00					
		100000	100000	epm	1,00					
		400000	399000	cpm	1.00					
			C.F	. AVERAGE	1.00					

Probe type(s) Probe1: PROPORTIONAL Probe2: PROPORTIONAL Probe3: PROPORTIONAL GEOMETRY VOLT ISOTOPE 1 EFF.(%) ISOTOPE 2 EFF.(%) ISOTOPE 3 EFF.(%) ISOTOPE 4 EFF.(%) MODEL WINDOW 43-37-1 PR145081 FIXED CONTACT 1780 Tc99 20 19 CONTACT 1780 Tc99 19 PR148454 TIXEO CONTACT 1780 20

Note: Window * ** OFF, Threshold ** 30 (Jntv).

INSTRUMENT CHECKS

ENVIRONMENTAL

1 mR/hr CHECK: BATTERY CHECK: NORMAL CHECK SOURCE I: N/A READING CHECK SOURCE 2: N/A READING:

TEMP: 21°C PRPSS: 760 mmHg HUMID: 27 %

THE SUGGESTED RECALIBRATION DATE FOR THIS INSTRUMENT IS 01/26/2008

Calibrated By: Reviewed By: Cal Date: 01/

Cal Date: 01/26/2007

Maryland License MD 33-021-01

4235

Enclosure 2 Reference: Response to Item 1

RSO Job No. 6793

RSO, Inc. P.O. Box 1450 Laurel, MD 20725 (301) 953-2482

Certificate of Calibration

ISSUED TO: Chesapeake Nuclear Services 788 Sonne Dr. Annapolis, MD 21401

INSTRUMENT: LUDLUM MODEL: 19 TYPE: MICROR

SN: 182679

CONTACT: Stewart Blurch PHONE: (410) 266-9174

PO NO: Credit Card

RSO, Inc. certifies that on 09/19/2006 the above described instrument was calibrated in a known radiation field using 137 Cs (662 keV) beam calibrator (I.L. Shepherd Model 28-6A, S/N 10056). Electronically pulsed using Ludlum 500-2, S/N 159110.

The results are tabulated below. Calibration is traceable to NIST.

Calibration Data

RANGE	EXPECTED	OBSERVED	C.E.
25	5	5 * uR/hr	1.00
	20	20 • uR/hr	1.00
50	10	10 • uR/hr	1.00
	40	40 ≠ uR/hr	1.00
250	50	50 ♦ uR/hr	1.00
	200	200 * uR/hr	1.00
500	100	100 → uR/hr	1.00
	400	400 • uR/hr	1.00
5000	1000	1000 nR/hr	1.00
	4000	4000 uR/hr _	1.00
		C.F. AVERAGE	1.00

· Electronically pulsed.

Probe type(s) Probet: SCINTILLATOR

Probe2:

Probe3:

MODEL

WINDOW GEOMETRY VOLT ISOTOPE 1 EFF.(%) ISOTOPE 2 EFF.(%) ISOTOPE 3 EFF.(%) ISOTOPE 4 EFF.(%)

NTERNAL

NONE

FRONT

INSTRUMENT CHECKS

1 mR/hr CHECK: BATTERY CHECK: NORMAL N/A CHECK SOURCE 1: N/A

CHECK SOURCE 2: N/A

READING: READING: **ENVIRONMENTAL**

TEMP. 24°C PRESS: 754 mmHg HUMID: 47 %

THE SUGGESTED RECALIBRATION DATE FOR THIS INSTRUMENT IS 09/19/2007

Calibrated By: Reviewed By: Cal Date: 09/19

Cal Date: 09/19/2006

Maryland License MD-33-021-01

14819

Reference: Response to Item 1

From: Dorsey Austin [DorseyA@RSOInc.com]

Sent: Wednesday, July 18, 2007 10:22 AM

To: 'J Stewart Bland'

Subject: RE: Ludlum 2360 w/43-68 probe Efficiency

Stewart

I checked the efficiency of your Ludlum 43-68 probe SN PR148454 using the three foot cable and found the efficiency for C-14 to be 11%.

Both meter and detector were in calibration at the time the test was performed.

Dorsey Austin 1-888-723-5463 dorseya@rsoinc.com

From: J Stewart Bland [mailto:jsbland@chesnuc.com]

Sent: Tuesday, July 17, 2007 4:16 PM

To: dorseya@rsoinc.com

Cc: jwmoon@verizon.net; bwbland@aol.com Subject: Ludlum 2360 w/43-68 probe Efficiency

Dorsey,

During an instrument check of our Ludhum 2360 with a 43-68 probe (# PR148454) performed for Byron Bland, you provided a C-14 detection efficiency of 11% for the use of the 3 foot detector cable. Will you please formally document this efficiency. An email transmittal should be sufficient for our records.

J Stewart Bland, CHP



788 Sonne Drive Annapolis, MD 21401 voice: 410-266-9174 fax: 410-266-5811

Enclosure 3

Annotated Version of Attachments 5.0 and 7.0 in Enclosure 1 to This Letter

(Facility response to NHPP comments in Enclosure 2, Item 2)



Radiation Service Organization

March 7, 2007

Chesapeake Nuclear Attn: Stewart Bland 788 Sonne Dr. Annapolis, MD 21401

Dear Mr. Bland,

Annotated in response for additional information

JWM00n 9-5-07 JB Bland 10-5-07

Enclosed please find the results for the wipe tests received on February 26, 2007. The wipe tests were analyzed using Liquid Scintillation and Gamma Counters. An individual data print out for each analysis process is attached for your review. The only elevated activity indicated on the analysis reports were as follows:

Wipe test group B1-B100 found 3 wipe tests exceeding 100 but less than 300 dpm. Wipe test group C1-C30 found 1 wipe test exceeding 100 but less than 300 dpm.

All other results indicated activity levels below 50 dpm which included the gamma test results.

If you have any questions please do not hesitate to call me at (301) 953-2482 ext. 305 or by e-mail james.dean@rsoinc.com.

Sincerely,

James W. Dean

Manager, Radiation Safety Services - Radiation Safety Officer

JWD:11P

Enclosure

REVIEWED BY:

NIH

User: NIH

Assay Definition- Al-Aloo

Assay Description: CHESAPEAKE NUCLEAR

Assay Type: DPM (Triple) Report Name: Report1

Output Data Path: C:\Packard\Tricarb\Results\NIH\Triple Lable DPM

Raw Results Path: C:\Packard\Tricarb\Results\NIH\Triple Lable DPM\20070227 0946.results

Assay File Name: C:\Packard\TriCarb\Assays\Triple Lable DPM.lsa

Count Conditions-

Nuclide: Triple Label

Quench Indicator: tSIE/AEC

External Std Terminator (sec): 0.5 2s%

Pre-Count Delay (min): 0.00

Quench Sets:

Low Energy: 3H-TOL-7-17-06

Mid Energy: 14C-TOL-07-17-06

High Energy: 32P-UG-02-28-05

Count Time (min): 5.00

Count Mode: Normal

Assay Count Cycles: 1 Repeat Sample Count: 1

#Vials/Sample: 1 Calculate % Reference: Off

Background Subtract: On - 1st Vial

Low CPM Threshold: Off 2 Sigma % Terminator: Off

UL Bkg Subtract Regions LĻ 0.0 12.0 1st Vial В 12.0 156.0 1st Vial C 156.0 2000.0 1st Vial

Count Corrections-

Static Controller: On

Luminescence Correction: On Heterogeneity Monitor: n/a Colored Samples: On

Coincidence Time (nsec): 18 Delay Before Burst (nsec): 75

Half Life-

Half Life Correction: Off

Regions Half Life Units Reference Date Reference Time

C

Cyc	cle	1 Resul	ts								
5	5#	Time	CPMA	CPMB	CPMC	DPM1	DPM2	DPM3	SIS	tSIE	LUM
BKg	1	10.00	5	8	6	0	0	0	53.33	565.99	2
A-4	2	5.00	6	12	1	10	14	1	50.09	507.24	1
	3	5.00	2	5	-1	3	6	-1	78.46	512.01	1
1	4	5.00	1	1	1	2	1	1	66.19	476.71	1
	5	5.00	3	3	2	5	3	3	49.74	467.57	1
	6	5.00	5	4	2	8	4	2	60.15	573.07	0
	7	5.00	1	5	0	1	5	-0	75.54	427.61	1
\checkmark	8	5.00	0	0	2	1	- 0	3	164.69	462.19	1
A-8	9	5.00	1	3	1	2	4	1	1.62	306.19	4

User: NIH

Protocol	# 1 - Tr	N	тн		1.0						
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A-9 10	.	•	7	-	•	1	2	04 27	411.28	1	
	5.00	0 3	1 2	1 -1	0 5	1 2	2 -2	84.37 43.92	479.24	1	
11 12	5.00 5.00	-0	3	2	-1	3	3	103.07	466.05	1	
13	5.00	-1	1	0	-3	1	-0	0.00	426.18	2	
14	5.00	-3	2	1	-6	2	1	0.00	425.05	2	
15	5.00	1	2	0	2	3	ō	76.50	463.16	1	
16	5.00	-1	3	-0	-3	4	~ 0	162.91	474.31	1	
17	5.00	3	2	2	6	2	3	37.19	470.20	1	
18	5.00	-1	3	3	-3	3	3	121.02	435.72	1	
19	5.00	-1	2	2	-2	2	2	70.56	412.71	1	
20	5.00	-1	3	1	-2	3	1	131.99	463.25	1	
21	5.00	-1	3	1	-4	4	2	75.56 0.00	443.58 385.77	1	
22 23	5.00 5.00	-2 -2	0 4	-1 -1	-5 -9	1 6	-1 -1	50.56	300.45	2 4	
23 24	5.00	-1	2	0	-4	3	0	0.00	336.11	1	
25	5.00	1	4	-0	ō	5	-0	48.35	476.27	ī	
26	5.00	-2	5	2	-6	6	2	77.54	401.47	1	
27	5.00	-1	1	1	-2	1	2	191.16	464.66	3	
28	5.00	-1	4	- 0	-3	4	- 0	121.77	450.80	1	
29	5.00	1	ı	0	1	1	-0	85.65	444.69	1	
30	5.00	-2	1	1	-4	2	1	0.00	434.83	2	
31	5.00	-1	1	3	-2	1	4	0.00	457.58	3	
32 33	5.00 5.00	-2 1	3 2	1 2	-5 2	4 1	1 2	165.62 42.15	440.46 473.72	1 1	
3 <i>3</i> 34	5.00	-1	3	1	-3	3	1	94.86	445.94	1	
35	5.00	0	1	1	0	i	1	26.39	467.69	1	
36	5.00	1	2	4	2	ī	4	49.53	478.99	1	
37	5.00	0	2	2	~0	2	2	58.39	495.99	1	
38	5.00	3	4	-1	4	4	-1	73.24	582.81	1	
39	5.00	1	-0	-1	1	-0	-1	202.71	530.46	1	
40	5.00	-1	2	-1	-2	3	-1	154.80	477.57	1	
41	5.00	-0	3	1	-2	4	2	145.75	474.29	1	
42	5.00	-0 -1	0 3	1	-0 -3	-0	1 1	0.00 164.44	450.80 482.72	1 1	
43 44	5.00 5.00	-1	3	1 1	-2	4 3	2	106.80	482.72	1	
45	5.00	1	1	2	2	0	2	92.63	469.04	3	
46	5.00	2	1	1	4	1	2	41.37	468.06	2	
47	5.00	-0	3	0	-2	4	-0	68.89	444.83	1	
48	5.00	1	3	1	1	4	1	30.16	468.23	2	
49	5.00	1	2	1	2	2	1	49.21	449.88	1	
50	5.00	-0	1	-0	-1	2	-0	0.00	437.52	3	
51	5.00	-2	2	1	~5	2	2	221.76 69.25	361.44 467.47	3	
52 53	5.00 5.00	0 -0	1 1	3 1	0 -1	1 1	4 1	0.00	464.38	1 3	
54	5.00	-1	0	3	-1	-0	4	0.00	410.80	2	
55	5.00	ō	3	ĺ	0	4	ī	33.72	456.61	9	
56	5.00	1	5	-0	2	5	-0	52.90	463.19	1	
57	5.00	3	3	1	5	3	2	58.61	503.89	1	
58	5.00	-0	5	3	-2	5	3	78.08	428.75	2	
59	5.00	-0	2	3	-1	1	4	345.52	470.79	1	
60	5.00	1	2	2	1	2	2	148.95	531.00	1	
61 63	5.00	1 -1	4	3	1 -3	4	3	35.79 235.67	422.45	2	
62 63	5.00 5.00	- O	2 2	0 1	-3 -0	2 2	-0 1	189.44	424.77 448.19	1 3	
64	5.00	-0	1	1	-1	2	1	9.18	444.92	3	
65	5.00	i	3	1	ō	3	1	43.93	444.11	2	
66	5.00	1	~ 0	1	2	-1	2	0.00	470.64	1	
67	5.00	- 0	2	2	-1	2	2	45.66	445.41	1	
68	5.00	0	4	-0	-1	5	-0	52.53	485.27	2	
69	5.00	1	3	1	1	3	1	44.72	493.74	1	
√ 70 A70 71	5.00 5.00	-1 -2	1 1	2 2	-2 -4	1 1	2 2	0.00 0.00	359.14 493.28	1 3	
A70 71	5.00	- 4	.	4	- *	_	2	0.00	T/J.20	J	

A-71 72	5.00	-1	1	1	-2	1	1	0.00	443.49	2
. 72	5.00	-1	3	ī	-3	3	1	92.85	489.84	3 3
74	5.00	2	2	1	4	2	ī	67.75	500.40	3 1
75	5.00	- 0	4	-0	-1	5	-0	45.08	447.97	1
76	5.00	~ O	-1	-0	-1	-1	-0	0.00	474.57	2
77	5.00	2	5	0	3	5	0	46.56	451.32	2
78	5.00	1	2	2	2	2	2	95.41	506.63	1
79	5.00	2	7	-0	3	8	-1	59.05	528.17	1
80	5.00	1	4	-2	-0	6	-2	95.06	501.81	1
81	5.00	1	2	0	2	2	0	96.76	493.99	2
82	5.00	0	5	2	-1	6	2	65.41	440.00	1
83	5.00	-0	2	2	-1	2	2	72.39	462.11	1
84	5.00	1	0	1	3	0	1	80.30	481.03	1
85	5.00	2	1	1	4	1	2	54.60	475.36	ı
86	5.00	- 0	2	1	-1	3	1	61.02	455.60	3
87	5.00	1	. 5	1	-0	6	1	70.80	470.08	2
88	5.00	1	- 0	-1	2	- 0	-1	335.18	476.39	1
89	5.00	-2	1	2	-4	0	3	0.00	495.81	2
90	5.00	. 1	2	3	1	2	4	73.47	387.85	1
91	5.00	-0	0	1	-1	0	1	0.00	444.24	2
92	5.00	1	1	4	2	1	5	0.00	419.76	1
93	5.00	-1	3	1	-2	3	1	125.54	448.79	1
94	5.00	- 0	2	3	-2	2	4	97.02	449.34	1
95	5.00	2	1	0	4	1	0	7.35	502.13	1
96	5.00	0	3	2	-0	4	2	99.12	435.06	1
97	5.00	2	2	0	5	2	0	32.94	440.45	1
98	5.00	-0	5	2	-3	6	3	62.61	462.34	2
⁹⁹	5.00	1	2	1	2	2	1	11.40	488.29	1
100	5.00	-1	2	0	-3	2	0	120.26	439.24	1
A-100 101	5.00	0	1	3	0	0	4	117.61	522.56	1

26 Feb 2007 14:20 RSO, Inc. 1A-100A SWIPES Protocol #: 7

Page #1 User : Lab Technician

CHESAPEAKE NUCLEAR

Count Time(minutes): Assay Type:

IPA Bkg Background Subtract : Outlier: 5.0 FLAG

> %Spillup: 0.00 %Spilldown: 0.00 Screening: OFF

REVIEWED BY: D 2/28/07

		Window_A		Window B		Window C		
	Nuclide: Bkg: Sigma: LCR: Half Life(hours Multiplier: %CV Flag Limit:	I-125 24.7 0.00 0	15 - 75 keV	Co-57 29.2 0.00 0 0.00	75 - 165 keV	MAN 15 229 2.00 0	- 2000 keV	
					pm on 10	ረጉ _ተ ረግ ነግዚብ	C:%SIG	
compasite gomen	5#	A:CPM	A:%SIG	B:CPM	B:%SIG	C:CPM 0.0	O - 40 J T G	
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٤	6	2.3	66.5	10.8		0.0	2. 7 4 7	
0	7	2.3	66.5	0.8	112	19.7	22.5	
1	පි	3.3	55.4	5.8	38.3	11.7	29.2	
$\frac{1}{\sqrt{2}}$	9	0.0		0.0		8.7	33.9	
	Ja Var	11.3	29.8	0.0	ri a c		76.7	
(24/	1) 11	0.0		3.8	51.3	1.7	1911	

EDITDATA.DO7 Archived to C:\ARCH\ARCH07D.183 C:\DATA\P7DATA Copied to C:\DATA\ARCH07A.183

26 Feb	07	14:19:18	Pa	ckard M	1ode l	5003	COBRA	SN: 424	1559	and the state of t	ngano namo West
PROTOCO	DL #	7	## ### ### ### ### ###	TO SERVICE STATE S							
SWIPES	EAKE NUC	Y EAD									
COUNT I		1.00	Minute	\$ 5 5							
Wi	indow A		i W	ndow B			W	indow C			
LLD:		keV	700. Bern 20	75			LLD:		keV		
ULD: EFF:	75 79	keV %	ULD: EFF:	165 85			ULD: EFF:	2000 70			
Sample #	A:CPM	A:DPM		S:CPM		8:0PM		C:CPM		C:DPM	W00 W00 V000
1			erak meren akkan bekan berak menan bek	· · · · · · · · · · · · · · · · · · ·	., .,	0	was very seas were word when	0		Ö	
2	Ō	0		0		0		O		0	
3	0	0		0		0		0		0	
4	a,	5		6		7		21		30	
5	0	0		0		0		0		0	

6 7 8 9 10	2 2 3 0 11	3 3 4 0 14	11 1 7 0	13 1 8 0	26 9 20 12 9	37 0 28 17
(24A) 11	0	0	4	4	ź	2

.

Protocol# 2 - Triple Lable DPM.lsa

Page # 1

User: Default

2/28/07

Assay Definition-BI- B100

Assay Description: CHESAPEAKE NUCLEAR

Assay Type: DPM (Triple) Report Name: Report1

Output Data Path: C:\Packard\Tricarb\Results\Default\Triple Lable DPM

Raw Results Path: C:\Packard\Tricarb\Results\Default\Triple Lable

DPM\20070227_2036.results

Assay File Name: C:\Packard\TriCarb\Assays\Triple Lable DPM.lsa

Count Conditions-

Nuclide: Triple Label

Quench Indicator: tSIE/AEC

External Std Terminator (sec): 0.5 2s%

Pre-Count Delay (min): 0.00

Quench Sets:

Low Energy: 3H-TOL-7-17-06 Mid Energy: 14C-TOL-07-17-06 High Energy: 32P-UG-02-28-05

Count Time (min): 5.00 Count Mode: Normal

Assay Count Cycles: 1 Repeat Sample Count: 1 Calculate % Reference: Off #Vials/Sample: 1

Background Subtract: On - 1st Vial

Low CPM Threshold: Off 2 Sigma % Terminator: Off

Regions	$_{ m LL}$	\mathtt{UL}	Bkg Subtract
A	0.0	12.0	1st Vial
В	12.0	156.0	1st Vial
C	156.0	2000.0	1st Vial

Count Corrections-

Static Controller: On Luminescence Correction: On Colored Samples: On Heterogeneity Monitor: n/a Coincidence Time (nsec): 18 Delay Before Burst (nsec): 75

Half Life-

Half Life Correction: Off

Regions Half Life Units Reference Date Reference Time Α

В C

Су	cle	1 Resul	ts								
_ :	S#	Time	CPMA	CPMB	CPMC	DPM1	DPM2	DPM3	SIS	tSIE	LUM
BKg	1	10.00	5	9	7	0	0	0	58.17	508.25	1
BI	2	5.00	-1	3	1	-3	4	1	55.31	412.81	1
1,	3	5.00	- 0	2	-2	-2	3	-2	24.80	341.97	1
~	4	5.00	0	1	-1	- 0	2	-1	122.67	421.97	1
	5	5.00	0	2	1	1	2	1	36.35	413.85	1
	6	5.00	- 0	1	-1	-1	2	-1	72.87	399.09	0
	7	5.00	- 0	~1	0	-0	-1	0	0.00	446.69	2
8.7	8	5.00	1	5	1	0	5	1	47.45	425.83	2

User: Default

22

B&	9	5.00	3	2	- 0	7	2	- 0	19.43	434.03	0
				206	-0 -2	281	230	-3	30.40		0
4	10	5.00	142							409.51	
	11	5.00	8	3	-1	16	2	-1	18.35	473.41	1.
	12	5.00	51	50	0	110	52	0	28.44	407.61	0
	13	5.00	1	3	-1	3	4	-2	13.19	377.05	1
	14	5.00	-1	2	0	-2	3	0	105.23	434.40	1
	15	5.00	-0	4	0	-1	5	0	83.34	460.97	1
	16	5.00	6	3	i	11	3	1	33.28	523.38	1
	17	5.00	1	1	-2	1	1	-2	64.50	486.01	1
	18	5.00	-1	5	-1	- 3	6	-1	5.34	349.32	1
	19	5.00	1	1	0	2	1	0	24.07	432.31	1
	20	5.00	2	1	-0	4	1	- 0	0.00	438.26	0
	21	5.00	3	13	-1	4	15	-1	52.15	474.39	1
	22	5.00	1	1	1	2	1	1	78.77	483.19	1
	23	5.00	3	1	-0	6	1	-0	42.17	503.43	1
	24		0	2	-1				33.62	494.81	1
		5.00				-0	3	-1			
	25	5.00	2	2	-2	4	2	-2	49.92	467.97	1
	26	5.00	-1	3	-1	-4	4	- 1	113.45	442.71	1
	27	5.00	3	1	-2	8	1	- 3	19.30	463.06	1
	28	5.00	1	-1	- 1	2	-1	-1	0.00	468.02	1
	29	5.00	1	0	0	2	- 0	0	0.00	470.18	1
	30	5.00	ō	4	-1	-1	5	-1	146.34	511.65	1.
			7	10	-1	12	11	-1	28.84	484.54	1
	31	5.00									
	32	5.00	0	-0	1	1	-1	1	0.00	417.74	6
	33	5.00	2	4	- 0	2	4	- 0	51.23	450.98	1
	34	5.00	1	2	-2	1	3	-2	94.08	519.56	1
	35	5.00	1	2	~ 0	1	2	- 0	57.04	472.85	1
	36	5.00	1	3	-1	1	4	-1	87.59	502.18	1
	37	5.00	1	3	-0	2	3	- 0	54.79	446.92	1
	38	5.00	0	2	-0	-0	2	-0	0.00	438.78	1
					- 0		1				
	39	5.00	-0	1		-0		-0	84.06	389.94	1
	40	5.00	62	46	0	124	47	0	23.22	476.51	0
	41	5.00	29	21	-1	64	22	-1	21.87	407.33	0
	42	5.00	2	3	0	2	3	0	51.82	521.94	1
	43	5.00	1	1	2	2	0	3	0.00	435.47	0
	44	5.00	0	- 0	-1	1	0	-1	0.00	443.59	1
	45	5.00	0	-2	0	2	-2	0	0.00	478.42	0
	46	5.00	-0	6	1	-3	7	í	57.52	464.18	1
	47	5.00	ı	-1	-1	2	- 1	-1	0.00	447.53	ī
	48	5.00	-1	2	0	-3	2	0	474.48	517.93	1
	49	5.00	0	1	- 0	-0	1	- 0	0.00	450.99	1
	50	5.00	1	1	-2	2	1	-2	122.44	428.73	1
	51	5.00	-1	1	-4	-2	3	- 5	63.13	464.40	1
	52	5.00	-1	3	-1	-4	4	-1	0.00	415.69	1
	53	5.00	0	1	0	1	1	0	140.84	441.55	1
	54	5.00	-1	2	-1	-3	3	-1	0.00	427.46	1
	55	5.00	2	-0	ō	4	-1	ō	0.00	447.01	1
					1		2		0.00		
	56	5.00	-2	1		-5		1		491.88	2
	57	5.00	- 1	2	-1	-2	3	-1	203.66	440.31	1
	58	5.00	0	0	1	1	- 0	1	0.00	450.53	1
	59	5.00	1	5	-3	1	7	-4	54.76	434.20	1
	60	5.00	1	1	-1	2	1	-1	45.40	458.36	1.
	61	5.00	0	5	-1	-1	6	-1	68.51	493.39	1
	62	5.00	-0	2	-1	-1	3		0.00	459.26	1
	63	5.00	1	1	-1	2	2	-2	67.41	517.56	1
							2				
	64	5.00	0	2	-1	-0	2	-1	13.34	441.37	1
	65	5.00	0	2	- 1	-0	3	-1	83.79	505.13	1
	66	5.00	1	1	- 0	1	1	- 0	93.19	450.49	1
	67	5.00	- 0	2	-1	-1	3	-1	134.52	466.33	1
	68	5.00	- 0	1	-1	-1	1	-1	0.00	440.87	1
	69	5.00	1	-1	-0	2	-2	- 0	0.00	472.70	2
B 69	70	5.00	-1	1	- 1	-2	1	-1	0.00	425.86	1
DO.			_	-	•	_					

ATTENDED TO THE POST OF THE PO User: Default

B70 7	1 5	.00	0	2	-1	-1	3	-1	87.94	428.66	1
77		.00	1	3	-1	0	4	-1	71.82	499.38	0
√ 7	3 5	.00	0	-1	-2	1	-1	-2	0.00	411.42	2
7	4 5	.00	0	-2	-2	2	-3	-2	0.00	533.90	2
7	' 5 5	.00	1	1	1	1	1	1	0.00	450.96	1
7	6 5	.00	2	0	-1	4	0	-1	0.00	504.50	0
7	7 5	.00	- 0	-2	3	- 0	-3	4	0.00	447.94	2
7	'8 5	.00	1	0	-0	2	0	- 0	0.00	426.97	0
7	9 5	.00	1	- 0	-1	3	-0	- 1	57.46	456.95	1
8	0 5	.00	1	0	-0	3	-0	- 0	95.80	472.18	1
8	1 5	.00	3	1	-1	5	2	-1	46.91	486.01	1
8	2 5	.00	1	0	-1	3	0	-1	115.79	516.21	1
8	3 5	.00	- 0	-1	2	~ 0	-1	3	0.00	459.62	2
8	4 5	.00	1	1	-2	3	1	-2	0.00	448.96	3
8	5 5	.00	-1	2	-3	-3	4	-4	73.83	449.59	1
8	6 5	.00	- 0	3	-1	-1	3	-1	152.77	472.92	3
8	7 5	.00	-1	1	-1	-2	2	-1	19.66	464.82	1
8	8 5	.00	0	4	-1	- 0	5	-1	99.37	457.58	1
8	9 5	.00	0	1	1	0	1	2	167.56	472.50	1
9	0 5	.00	-0	4	2	-2	5	2	124.60	464.35	2
9	1 5	.00	1	-0	1	2	-0	1	0.00	546.07	1
9	2 5	.00	-1	1	3	-3	1	3	0.00	478.54	3
9	3 5	.00	2	1	1	5	0	1	9.28	472.60	2
9	4 5	.00	1	2	2	1	2	2	74.00	453.37	1
9	5 5	.00	0	1	-1	0	1	-1	16.18	451.53	3
9	6 5	.00	3	0	2	6	-1	3	57.03	498.04	1
9	7 5	.00	1	2	2	3	1	3	13.89	479.78	1
9	8 5	.00	2	-1	-2	4	-1	-2	0.00	503.45	1
9	9 5	.00	1	- 0	3	2	-2	4	0.00	448.46	3
10		.00	0	1	-1	- 0	1	-1	137.03	452.35	3
B100 10	1 5	.00	0	3	-1	-1	4	-1	54.32	441.07	0

KbU, Inc. Page #1 57 1 27 577 TH 144 Protocol #: 7 SWIPES 100B User : Lab Technicia CHESAPEAKE NUCLEAR Count Time(minutes): 1.00 Assay Type: PM REVIEWED BY: Background Subtract : IPA 8kş Outlier: 5.0 FLAG ∛Տթiiluթ: 0.00 %Spilldown: 0.00 OFF Screening: Window A Window B Window C Nuclide: 1-125 75 keV 75 - 165 keV Co-57 MAN 15 - 2000 keV 8kg: 24.7 29.2 229 Sigma: 0.00 0.00 2.00 _(R: ŷ 0 2 Half Lifethours). 0.00 0,00 multiplier: 1.0000

6 S# \$ 1	A:UPM 1.3	A:%SIG 89.1	8:CPM 0.0	B:%\$1G	C 1 CPM O JO	C:\$SIG
¥ 2 3	0.3	196	5.8	41.5	1.7	76.7
	0.0 0.0		0.0 8.1	74.5	10.7 0.0	30.6
¥:50.	2,3 0.0	66.5	22.8 2.8	20.9 59.8	33.7 3 9 .7	17.2 16.9
Jug ≥	0.0 5.3	9 C)	0.8	112	4.7	46.1
9	5.3	43.6 43.6	6.8 7.8	38.3 35.8	15.7 24.7	25.2 20.1
(3/B) 11	10.3	31.2	5.8 0.0	41.5	38.7 0.0	16.1

0.00

EDITDATA.DO7 Archived to C:\ARCH\ARCHO7D.185 C:\DATA\P7DATA Copied to C:\DATA\ARCHO7A.185

XXV Flas Limit:

0.00

lo Feb	0.7	14:41:17	Packard	Mode	1 5003	COBRA	5N: 420	1559	
PROTOCO SWIPES CHESAPE COUNT T	AKE NUC	·	Minutes	بندو موجود مارد مردو بارد	come come come deserving come come come come come come come come	er van dag een kom dan -	and the same of the same of	the two two two	
	ndow A	ment according to the control of the	Window E	Ž.		W.	indow (
LLD: ULD: EFF: Sampl:	19 75 24	keV keV °	LLD: 7' ULD: 16' EFF: 8'	b KeV b %		ULD: EFF:	15 2000 70	keV %	
	- A 154 114):():M		*'	8:DPM	ndar Moor acon labor hours down	C:CPM	والمهجة عربوا درا المك	CODPM
1 2 3 4 5	<i>S</i> <i>O</i> 0	2 0 0 3) 5) 2 3	0 7 0 2 27		0 2 11 0 34		0 18 0 48

	6 7	0	0	3	3,	40 5	S6
	ව	5	7	7	8	16	22
	10	10	1 3	8	9	25	35
(31B)	11	0	7.3	6	/	39	55
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Protocol# 1 - Triple Lable DPM.lsa

Page # 1 User: NIH

NIH

Assay Definition- C1-C30

Assay Description: CHESAPEAKE NUCLEAR

Assay Type: DPM (Triple) Report Name: Report1

Output Data Path: C:\Packard\Tricarb\Results\NIH\Triple Lable DPM

Raw Results Path: C:\Packard\Tricarb\Results\NIH\Triple Lable DPM\20070228_0727.results

Assay File Name: C:\Packard\TriCarb\Assays\Triple Lable DPM.lsa

Count Conditions-

Nuclide: Triple Label

Quench Indicator: tSIE/AEC

External Std Terminator (sec): 0.5 2s%

Pre-Count Delay (min): 0.00

Quench Sets:

Low Energy: 3H-TOL-7-17-06 Mid Energy: 14C-TOL-07-17-06 High Energy: 32P-UG-02-28-05

Count Time (min): 5.00 Count Mode: Normal

Repeat Sample Count: 1 Assay Count Cycles: 1 Calculate % Reference: Off #Vials/Sample: 1

Background Subtract: On - 1st Vial

Low CPM Threshold: Off 2 Sigma % Terminator: Off

UL Bkg Subtract Regions LL0.0 12.0 1st Vial 1st Vial 156.0 В 12.0 1st Vial 2000.0 С 156.0

Count Corrections-

Static Controller: On Luminescence Correction: On Heterogeneity Monitor: n/a Colored Samples: On Coincidence Time (nsec): 18 Delay Before Burst (nsec): 75

Half Life-

Half Life Correction: Off Reference Time Regions Half Life Units Reference Date

В C

Cy	cle	1 Resul	ts								
-	S#	Time	CPMA	CPMB	CPMC	DPM1	DPM2	DPM3	SIS	tSIE	LUM
BKB	1	10.00	5	8	6	0	0	0	57.03	557.01	1
10	2	5.00	. 0	1	0	-0	1	. 0	94.29	462.46	1
١	3	5.00	0	3	1	- 0	4	2	23.18	445.34	1
¥	4	5.00	-1	5	2	-3	6	3	68.50	498.42	2
	5	5.00	0	0	-1	0	1	-1	67.14	536.01	1
	6	5.00	-1	2	1	3	2	2	165.05	401.30	3
	7	5.00	-1	1	2	-4	1	2	0.00	453.80	2
	8	5.00	0	2	- 0	0	3	- 0	4.01	466.14	1
δc	9	5.00	0	2	1	0	3	1	49.20	447.97	0

0 56.09 451.11 1

Protocol# 1 - Triple Lable DPM.lsa

30 5.00 30¢31 5.00

User: NIH NIH 3 0 1 3 2 3 1 3 3 2 4 1 5 3 2 0 4 8 - 1 - 1 -0 14.28 90 10 5.00 -0 -2 435.11 0 1 1 11 12 0.00 467.48 5.00 -0 -3 -0 2 1 68.81 2 2 1 4 496.99 5.00 1 1 4
-4
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1
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0
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-2
5
21 4 494.78 2 3 2 24.20 13 5.00 0 -2 3 0 291.31 485.55 1 5.00 14 15 5.00 - 0 -1 4 -1 98.21 526.58 2 1 0 1 1 3 100.05 473.52 16 5.00 0 -1 5.00 4 1 15.83 409.92 1 17 0 43.64 18 5.00 0 4 3 5 1 5 3 2 -0 4 4 419.27 1 2 88.34 19 5.00 0 508.49 1 -2 1 109.70 469.81 1 20 5.00 1 1 26.30 493.88 0 21 5.00 2 1 - 0 2 81.71 22 5.00 457.87 1 82.76 0 131.77 1 - 0 23 5.00 485.97 24 5.00 0 0 525.48 1 6 2 J 25 5.00 -0 2 0.00 365.34 1 0 60.47
-2 10 2 49.10
1 5 17 1 51.71
0 21 23 -0 37.18
0 226 195 -1 37.13
0 -1 4 0 56 60.47 26 5.00 - 0 400.52 1 0 4 27 5.00 436.35 1 1 443.39 15 28 5.00 1 20 12 20 124 176 -0 4 12 451.32 0 29 5.00 474.19 0

26 Feb 2007 14:36 RSO, Inc. Protocol #: 7

SWIPES 1C-30C

Page #1

User : Lab Technician

CHESAPEAKE NUCLEAR

Count Time(minutes): 1.00

Assay Type:

CPM

Background Subtract : IPA 8kg Outlier:

5.0 FLAG

%Spillup: %Spilldown:

0.00 0.00

Screening:

OFF

REVIEWED BY:

	Window A			Window B			Window C	
Nuclide:	I-125	15 -	75 keV	Co-57	75 -	165 keV	MAN	15 - 2000 keV
Bkg:	24.7			29.2			229	
Sigma:	0.00			0.00			2.00	
LCR:	0			0			0	
Half Life(hours):	0.00			0.00				
Multiplier:	1.0000							

%CV Flag Limit: 0.00 0.00

S# A:CPM A:%SIG B:CPM B:%5IG C:CPM C:%5IG 1 0.0 2.8 59.8 0.0 0.0 0.0 0.0 0.0 0.8 112 0.0

EDITDATA.DO7 Archived to C:\ARCH\ARCH07D.184 C:\DATA\P7DATA Copied to C:\DATA\ARCH07A.184

26 Feb 07 14:35:40 Packard Model 5003 COBRA SN: 424559

----PROTOCOL # 7

SWIPES

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COUNT	TIME EAKE NU(00	Minut	es						
W	indow A		A John Wall Will Aven an	W	indow B			W	indow C		
	ternal agreets and makes beginn to being gather to				**** *** **** **** **** **** **** *	~				~~	
LLD:	15	keV		LLD:	75	keV		LLD:	15	keV	
ULD:	7.5	keV		ULD:	165	keV		ULD:	2000	keV	
EFF:	79	6		EFF;	85	%		EFF:	70	e .	
Sample											
#	A:CPM		A:DPM		B:CPM		B:DPM		C:CPM		C:DPM
1	0	en mar non work to	0	the season where these many waste to	3		3		0	~ ~~ ~~	0
2	0		0		0		0		0		0

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Radiation Service Organization

March 27, 2007

Chesapeake Nuclear Attn: Stewart Bland 788 Sonne Dr. Annapolis, MD 21401

Dear Mr. Bland,

Annotated in response to request for additional information JW Moon 9-5-07

38/ord 10-5-07

Enclosed please find the results for the wipe tests received on March 26, 2007. The wipe tests were analyzed using Liquid Scintillation, Gamma Counters and Gamma Spectroscopy. An individual data print out for each analysis process is attached for your review. The only elevated activity indicated on the analysis reports were as follows:

Wipe test group 3C to 67C (37 wipe tests) found 3 wipe tests exceeding 100 and 2 wipe tests exceeding 1,000 dpm. Please review attached beta-gamma LSC data results for activity concentrations.

Analysis of swabs 5, 6 & 8 found no activity exceeding 10 dpm. Please review attached beta-gamma LSC data results for activity concentrations.

Wipe tests were Gamma counted and analysis results indicated all activity levels below 50 dpm. Please review attached gamma data results for activity concentrations.

Gamma spec analysis of scrapings received within 7 small bags found no spectrum outside of normal background.

If you have any questions please do not hesitate to call me at (301) 953-2482 ext. 305 or by e-mail james.dean@rsoinc.com.

Sincerely,

James W. Dean

James W. Dear

Manager, Radiation Safety Services - Radiation Safety Officer

Enclosure

CHAIN-OF-CUSTODY RECORD

											Sycc						s	AMPI	LE PA	RAM	ETER	t									
		CER					TOTAL		d Scin		valitative gamma																				
	DATE SAMPLED	FIELD IDENTIFICATION NUMBER	C of C NUMBER	SAMPLE TYPE	COMP	G R A B			Liguia		Qual,																				
- [3-22-07	310-676		Smear			36		V																\vdash	T					
	3-22-07	1138 1138		Scrappings			7				V	4	=	C	110	PC+	ve	4	;1	8-	Spi	اح.	an	£1~	12	\$		\Box			
	3-12-67	56,8 34		Ut 1 smen														T	′												
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	3-12-07	5,6,8		Swab			3		\checkmark																						
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REMARKS				

Page 1 of 2

* 37 NOT 36 RE

26 Mar 2007 14:12 RSO. Inc. Protocol #: 7

\$CV Flag Limit: 0.00

SWIPES

Page #1 User : Lab Technician

CHESAPEAKE NUCLEAR

Count Time(minutes): Assay Type:

1.00

Background Subtract : IPA Bkg Outlier:

5.0 FLAG 0.00

%Spillup: %Spilldown: Screening:

0.00 OFF

REVIEWED BY:

	Window A			Window B			Window C	
Nuclide:	I-125	15 -	75 keV	Co-57	75 -	165 keV	MAN	15 - 2000 keV
Bkg:	23.1			26.7			210	
Sigma:	0.00			0.00			2.00	
LCR:	0			0			0	
Half Life(hours):	0.00			0.00				
Multiplier:	1.0000							

0.00

mark.						
F 5#	A:CPM	A:%SIG	B:CPM	B:%SIG	C:CPM	C:%SIG
401	1.9	72.2	0.0		0.0	
6.t 2	9,9	31.8	2.3	65.4	6.2	40.2
, 3 3	3.9	50.5	3.3	54.7	15.2	28.6
25 4	0.0		3,3	54.7	20.2	22.2
7 5	0.0		3.3	54.7	21.2	21.7
\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	11.9	29.0	6.3	39.7	41.2	15.6
VJ 3 7	0.0		0.3	171	6.2	40.2

EDITDATA.DO7 Archived to C:\ARCH\ARCHO7D,191 C:\DATA\P7DATA Copied to C:\DATA\ARCH07A.191

26 Mar 07 14:10:59 Packard Model 5003 COBRA SN: 424559

PROTOCOL # 7

SWIPES

CHESAPEAKE NUCLEAR

COUNT TIME 1.00 Minutes

Ы	ndow A		W.	indow B			W	indow C		
164 900		***	-	the space with their liquid given displaying	••		****		•••	
LLD: ULD; EFF: Sample		keV kgV を	LLD: ULD: EFF:	75 165 85			LLD: ULD: EFF:	15 2000 70		
##	A:CPM	A:DPM		B:CPM		8:0PM		C:CPM		C:DPM
1	Z	Ç.	?	0		0		0		0
2	10	13	;	2		3		5		9
3	4	S	,	3		4.		15		22
4	0	C)	3		4		20		29
5	0	C	+	3		4		21		30
6	1.2	1 5		6		7		41		59
7	0	C	ŀ	0		0		6		9

Protocol# 1 - Triple Lable DPM.lsa

NIH

User: NIH

Assay Definition-

Assay Description: CHEASAPEAKE NUCLEAR

Assay Type: DPM (Triple) Report Name: Report1

Output Data Path: C:\Packard\Tricarb\Results\NIH\Triple Lable DPM

Raw Results Path: C:\Packard\Tricarb\Results\NIH\Triple Lable DPM\20070326_1554.results

Assay File Name: C:\Packard\TriCarb\Assays\Triple Lable DPM.lsa

Count Conditions-

Nuclide: Triple Label

Quench Indicator: tSIE/AEC

External Std Terminator (sec): 0.5 2s%

Pre-Count Delay (min): 0.00

Quench Sets:

Low Energy: 3H-TOL-7-17-06

Mid Energy: 14C-TOL-07-17-06

High Energy: 32P-UG-02-28-05

Count Time (min): 5.00

Count Mode: Normal

Assay Count Cycles: 1

Repeat Sample Count: 1 #Vials/Sample: 1 Calculate % Reference: Off

Background Subtract: On - 1st Vial

Low CPM Threshold: Off 2 Sigma % Terminator: Off

Regions	$_{ m LL}$	\mathtt{UL}	Bkg	Subt	tract
A	0.0	12.0		lst	Vial
В	12.0	156.0		1st	Vial
C	156.0	2000.0		1st	Vial

Count Corrections-

Static Controller: On Colored Samples: On

Heterogeneity Monitor: n/a

Coincidence Time (nsec): 18 Delay Before Burst (nsec): 75

Half Life-

В C

Half Life Correction: Off

Regions Half Life Units

Reference Date

Luminescence Correction: On

Reference Time

Cycle 1 Pegulta

CAGTE	ı kesul	LTS								
S#	Time	CPMA	CPMB	CPMC	DPM1	DPM2	DPM3	SIS	tSIE	LUM
BKG-1	10.00	6	11	6	0	0	0	68.71	527.52	2
#1 2	5.00	1	-2	3	2	-3	3	0.00	490.83	4
√ 3	5.00	1	-2	-1	4	-2	-1	0.00	497.42	4
31C 4	5.00	0	1	1	0	1	,2	0.00	481.85	2
, 5	5.00	1	0	2	2	-0	3	0.00	505.94	2
\ 6	5.00	0	0	1	1	- 0	1	0.00	497.94	2
] 7	5.00	1	7	3	0	7	4	47.92	456.63	2
∨ 8	5.00	1	2	1	1	3	2	0.00	502.96	2
38C 9	5.00	0	4	3	-0	4	3	17.25	464.03	2

Protocol# 1 - Triple Lable DPM.lsa

NIH

39C 10	5.00	0	1	2	0	1	2	0.00	470.50	2
3/0 11	5.00	-1	1	1	-2	2	1	0.00	473.34	3
1 12	5.00	0	2	2	-0	2	2	0.00	422.26	2
V 12	5.00	-1	-1	5	-2	-2	6	0.00	498.13	3
43C 14	5.00	2426	4726	5	3998	5389	-16	41.30	482.06	07 SINK TOP
44c 15	5.00	100	162	3	168	182	3	41.74	518.21	0/1138
450 16	5.00	129	168	3	237	184	3	35.88	481.58	0)120
17	5.00	5	5	2	11	5	3	4.24	408.48	1
V 18	5.00	Ō	4	2	-1	5	2	40.89	407.03	2
19	5.00	9	12	4	16	12	4	23.53	457.51	1 , ,
49C 20	5.00	649	1164	1	1147	1318	-3	37.46	447.54	O Speed Concentrator
, 21	5.00	- 0	3	2	-2	3	2	0.00	420.95	1 (internals) 113A
¥ 22	5.00	3	1	1	7	1	2	0.00	446.18	2
23	5.00	1	5	- 0	-0	6	-0	45.66	432.58	2
24	5.00	-1	1	1	-2	1	1	0.00	397.77	1
25	5.00	1	1	3	3	0	3	0.00	464.81	2
26	5.00	9	3	-1	18	3	-1	8.11	490.25	1
27	5.00	14	13	-2	30	14	-2	12.92	395.32	1
28	5.00	1	0	2	3	-0	2	0.00	496.22	2
29	5.00	26	2	1	63	- 2	1	0.00	408.92	1
30	5.00	· 3	3	0	5	4	0	0.00	487.01	2 2
31	5.00	6	2	1	12	· · · 1	1	0.00	488.62	
32	5.00	5	0	2	10	- 1	2	0.00	500.78	2
33	5.00	24	9	-1	51	8	-1	14.71	485.19	1 RM 113C
34	5.00	44	22	1	107	20	1	13.43	369.64	O) Pre-decon
35	5.00	10	5	-2	20	6	-2	22.25	521.84	1 > Datacopyator
36	5.00	4	3	1	7	3	2	31.37	487.86	الماسلامة سال
66C 37	5.00	17	10	3	32	9	3	18.44	541.92	1.J.`
# 37 38	5.00	2	2	2	4	2	2	1.42	507.76	2 PANISD CONKEY
/ #5 39	5.00	1	-3	0	4	-4	0	0.00	535.89	3/ 164+ 816E
/ 46 40	5.00	3	3	3	6	3	4	29.67	515.97	2 Drain
*3 41	5.00	3	-2	3	6	-4	3	0.00	524.08	Z
\ _										- Swabs

SPECTRUM ANALYSIS

3/26/07 12:30:12 PM Report Generated On

: Soil Sample Title

Spectrum Description

: CHESAPEAKE NUC Sample Identification

Sample Type

: Marinelli Beaker Sample Geometry

3.00 Peak Locate Threshold

Peak Locate Range (in channels): 50 - 8192 50 - 8192 Peak Area Range (in channels) : 1.000 keV Identification Energy Tolerance :

1.000E+000 Grams Sample Size

3/26/07 12:15:06 PM Sample Taken On 3/26/07 12:15:06 PM Acquisition Started

900.0 seconds Live Time Real Time 900.1 seconds

> Energy Calibration Used Done On 1/25/07 Efficiency Calibration Used Done On : 1/23/07

> > Note: Scrapings were wex suffice over contaminated linolaum floor tiles Pm 113 and

I put these 7 small bags of scrappings into a beaker of counted. Let me know if you need additional info.

awhoun

Uncertainty

(pCi/Gram)

Name Confidence (keV)

**************** $\begin{smallmatrix} N&U&C&L&I&D&E&&&I&D&E&N&T&I&F&I&C&A&T&I&O&N&&R&E&P&O&R&T \end{smallmatrix}$ ************ Soil Sample Title: Nuclide Library Used: C:\GENIE2K\CAMFILES\NORMPLUS.NLB IDENTIFIED NUCLIDES Nuclide Energy Yield Activity Activity Ιd

(왕)

Energy Tolerance : 1.000 keV

Nuclide confidence index threshold = 0.30

Errors quoted at 2.000 sigma

^{* =} Energy line found in the spectrum.

^{@ =} Energy line not used for Weighted Mean Activity

************************ INTERFERENCE CORRECTED REPORT **********************

Nuclide Wt mean Wt mean Activity Activity Nuclide Id (pCi/Gram) Confidence Name Uncertainty

- ? = nuclide is part of an undetermined solution
- X = nuclide rejected by the interference analysis
- @ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 2.000 sigma

****** UNIDENTIFIED PEAKS ******

> Peak Locate Performed on: 3/26/07 12:30:11 PM

Peak Locate From Channel: 50 Peak Locate To Channel: 8192

Peak Size in Peak CPS Peak Energy Counts per Second % Uncertainty (keV) No.

26.35 1.5569E-001 25.45 1

M = First peak in a multiplet region

m = Other peak in a multiplet region

F = Fitted singlet

Errors quoted at 2.000 sigma



Radiation Service Organization

July 10, 2007

Chesapeake Nuclear Attn: Stewart Bland 788 Sonne Dr. Annapolis, MD 21401

Dear Mr. Bland,

Annotated in response to request for additional information Jumoon 9-5.00

JSB1014 10-5-07

Enclosed please find the results of the 10 wipe tests received on July 2, 2007. The wipe tests were analyzed using Liquid Scintillation (LSC) counting technology. An LSC individual data results print out denoting each analysis result is attached for your review. The results of the first sample are for background determination. The wipe test analysis begins with sample location #2. Wipe test results were background deducted presenting net results. Reported analytical data indicates all activity levels below 50 dpm.

If you have any questions please do not hesitate to call me at (301) 953-2482 ext. 305 or by e-mail james.dean@rsoinc.com.

Sincerely.

James W. Dean

Manager, Radiation Safety Services - Radiation Safety Officer

Enclosure

July 2, 2007

Stewart Bland Chesapeake Nuclear Services, Inc. 788 Sonne Dr. Annapolis, MD 21401 USA

Dear Stewart:

The ten swipes delivered to RSO Inc. were found to be < 50dpm. The final results will be sent to you with the invoice.

Sincerely,

Mr. Richard Emmons Laboratory Technician

Protocol# 2 - Triple Lable DPM.lsa

User: Default

REVIEWED BY:

7/06/09

Assay Definition-

Assay Description: CHESAPEAKE NUCLEAR

Assay Type: DPM (Triple) Report Name: Report1

Output Data Path: C:\Packard\Tricarb\Results\Default\Triple Lable DPM

Raw Results Path: C:\Packard\Tricarb\Results\Default\Triple Lable

DPM\20070702_1238.results

Assay File Name: C:\Packard\TriCarb\Assays\Triple Lable DPM.lsa

Count Conditions-

Nuclide: Triple Label

Quench Indicator: tSIE/AEC

External Std Terminator (sec): 0.5 2s%

Pre-Count Delay (min): 0.00

Quench Sets:

Low Energy: 3H-TOL-7-17-06 Mid Energy: 14C-TOL-07-17-06 High Energy: 32P-UG-02-28-05

Count Time (min): 1.00 Count Mode: Normal

Assay Count Cycles: 1 #Vials/Sample: 1

Repeat Sample Count: 1 Calculate % Reference: Off

Background Subtract: On - 1st Vial

Low CPM Threshold: Off 2 Sigma % Terminator: Off

UL Bkg Subtract Regions LL0.0 12.0 1st Vial Α В 12.0 156.0 1st Vial С 2000.0 1st Vial 156.0

Count Corrections-

Static Controller: On Colored Samples: On

Luminescence Correction: On Heterogeneity Monitor: n/a Delay Before Burst (nsec): 75

Half Life-

Half Life Correction: Off

Coincidence Time (nsec): 18

Regions Half Life Units Reference Date Reference Time Α

В C

Cycle	1	Results
CACTE	_	Kesures

S#	Time	CPMA	CPMB	CPMC	DPM1	DPM2	DPM3	SIS	tSIE	LUM
1	10.00	7	8	8	0	0	0	53.73	524.81	2
2	1.00	8	21	-2	10	25	-3	57.54	556 <i>.</i> 93	ORMIIZE Sinktop
3	1.00	1	6	-1	-1	7	- 2	101.77	552.25	ny Kempani
4	1.00	3	3	-2	5	3	- 3	71.39	556.11	O adjacent surpaces
5	1.00	5	5	-2	8	6	- 3	31.53	544.69	o) post remediation
6	1.00	-2	2	-3	-5	4	- 4	587.91	480.71	O RMIISA below SC
7	1.00	-3	1	5	-8	1	6	0.00	424.99	OZRM113 Floor
8	1.00	6	10	- 0	9	12	- 0	33.38	563.77	of Post Remodration

	1:12:46 P			caSmart	(TM) - 1	.31 - Se	rial# 4	124558	and the second s	Page # 2
Protecol	# 2 - Tri	bie Papie	DPM.15	a					Use	r: Default
9	1.00	14	6	- 4	27	6	-5	22.48	529.99	of Rm 113C Refrige
10	1.00	4	2	-2	7	2	- 3	64.25	531,70	Of Post Decon
11	1.00	-2	5	-1	-6	6	-2	120.79	547.00	O RM 113D Adjacent Surface officer postremediation
									í	<u>.</u>

D 7/06/07

The following additional information was provided to NHPP by the facility contractor, in reference to the previous 18 pages (Annotated Version of Attachments 5.0 and 7.0 in Enclosure 1)

Page 5: NHPP Reviewer Comments

Gamma count results—Can sample #s 1-10 be annotated to an actual field location? Is #1 background? I only see "(24A)" shown for sample #11. It is just unclear what sample # goes with what field location.

Facility Contractor Response: The contracted laboratory performed the gamma analysis before the LSC analysis. Ten wipe tests were separated and rolled together in their packaging and counted as a composite sample. If elevated activity is found, then each of the 10 wipes would be counted separately. Therefore, there were 10 composite vials analyzed for each of the A and B sets, and only 3 for the C set. There is no first vial for background for gamma wipe test analysis. No elevated gamma was detected, so we do not have separate results by individual location for the gamma analysis. The exception for this is for location #24A, which was counted separately and represented a sample of the liquid from the drum in the radwaste processing area (Room 137).

Page 6: NHPP Reviewer Comments

Looks like sample #6 was lost on page break. Can you write in the results for it?

Facility Contractor Response: The results for sample #6 have been deduced from the count data which is also included (in a table of count data above the table with the missing sample 6 entry).

Page 10: NHPP Reviewer Comments

Same as Page 5...I only see "(31B)" identified for sample #11.

Facility Contractor Response: Same response as provided above [for Page 5]. The separate gamma analysis for smear #31B was for liquid (water) that had accumulated under a sink in Room 113B.

Page 11: NHPP Reviewer Comments

Sample #6 results were lost between page break.

Facility Contractor Response: This is the same issue as discussed above [for Page 6]. Results have been deduced from the count data that is included.

Page 14: NHPP Reviewer Comments

Note in header says these are for samples 1C-30C. I am not sure what this means since there are only three sample count results. Were samples composited? Maybe these could be annotated.

Facility Contractor Response: As discussed above, for the gamma counts the smears were composited into groups of 10. Therefore, there were only three composite analyses. Since there was no detectable gamma, separate smear analyses were not performed.

Page 17: NHPP Reviewer Comments

Same comment as Pages 5, 10, and 14 regarding what field samples these correspond to. From cover letter this appears to be seven scrapings from rooms 113/113B.

Facility Contractor Response: The analysis was a qualitative evaluation of wax scrapings from the floor in Rooms 113 and 113B from areas identified as contaminated. The purpose of these samples was for qualifying the contamination, whether embedded in the wax or the floor tile. The separate gamma analysis and the composite gamma spectral analysis showed no detectable gamma radionuclides. The contaminated tiles were removed during the remediation.

Enclosure 4

Additional Comments on Enclosure 1 by NHPP Reviewer (Thomas E. Huston, PhD, CHP) with Permittee Responses

Note: Facility's response to each comment is shown in italics after the NHPP comment.

1. A review of permit records indicates there has been no history of sealed sources over 100 microcuries used at the facility. There have been some smaller sealed sources listed on the license/permit that were possibly used in Building 72. The sources include the following:

C-14: Not more than 25 microcurie/source Eu-152: Not more than 25 microcurie/source

Facility's response to Point 1

The VAHA RSO [Radiation Safety Officer] maintained a surveillance program over the activities in Building 72 that included detailed radionuclide inventories including sealed sources and their ultimate disposition. The C-14 sealed source was not listed as having been used in Building 72 and the Eu-152 source (installed in a liquid scintillation counter) had been removed from the instrument and transferred to the inventory of the radiopharmaceutical lab in the main hospital.

2. The report did not contain any discussion of the maximum quantities of radioactive materials that could have been present in the buildings and last dates of use. Also a comparison of the decay-corrected maximum possession values to 10 CFR 20, Appendix C is warranted (as per NUREG-1757, Vol. 1, Rev. 2, Figure 7.1).

A review of the facility use permit indicates the possession limits shown in the table below for research purposes, potentially used in Building 72 (e.g., see Items 6F-6S on Amendment No. 69 of license/permit for unsealed sources). Based on information in permit files maintained by NHPP, the last research use of radionuclides in Building 72 was most likely during 2001. So a five-year decay period was applied to determine which nuclides could still be present at significant levels. Based on conservative assumptions only H-3, C-14, Cl-36, and Fe-55 could remain as potential contaminants of significance (i.e., above values in 10 CFR 20, Appendix C). H-3 is a very low-energy beta emitter (max energy = 19 keV). C-14 is a low-energy beta emitter (max energy = 710 keV). Fe-55 decays by electron capture, emitting low-energy x-rays.

			Maximum	10 CFR 20	
		Possession	Amount (mCi)	Appendix C	Activity
Nuclide	Half life	Limit (mCi)	(after 5yr-decay)	(mCi)	Fraction
H-3	12.3 y	100	75.449	1	0.43
C-14	5730 y	90	89.946	0.100	0.51
P-32	14.3 d	150	0.000	0.010	0.00
S-35	87.4 d	2	0.000	0.100	0.00
CI-36	301000 y	9	9.000	0.010	0.05
K-42	0.5 d	25	0.000	1.000	0.00
Ca-45	163 d	9	0.004	0.100	0.00
Cr-51	28 d	30	0.000	1.000	0.00
Fe-55	997 d	10	2.810	0.100	0.02
Fe-59	45 d	10	0.000	0.010	0.00
Ru-103	39 d	5	0.000	0.100	0.00
I-125	60.1 d	105	0.000	0.001	0.00
I-131	8 d	3	0.000	0.001	0.00
		Total>	177.209		1.00

Possession Limits set as maximum values observed in past permits. 5-year decay used per references in permit file that research use ended upon shipment of wastes offsite in 2001.

Facility's response to Point 2

We felt that since the RSO and his staff had maintained such tight controls of the radionuclide inventories present in Building 72 including new incoming inventory additions disposals and current inventories verified quarterly, that such an analysis as performed in Item 2 was not necessary. Of note, while listed on the facility permit, [there were] no indications that the radionuclides Cl-36 or Fe-55 were ever ordered or used in Building 72. The inventories left only the key long-lived radionuclides C-14 and H-3 of primary concern.

3. Survey results with portable meters use the detector efficiency for C-14 (around 0.20) to convert cpm to dpm. There was no provision to account for the possibility that some surface contamination may be from H-3 (or possibly other contaminants such as Cl-36 and Fe-55 which were listed on past versions of the license and may have been introduced into the area). The total effective efficiency should be:

Total Efficiency = (Fraction of Activity that is C-14)*(Efficiency for C-14)
+ (Fraction of Activity that is H-3)*(Efficiency for H-3)

(Other Redienvelides)(Efficiency of other resulting)

+ (Other Radionuclides)(Efficiency of other nuclides)

Since the Efficiency for H-3 is zero and assuming the same for all other nuclides except C-14 (for detectors used in this effort), the total efficiency simply becomes:

Total Efficiency = (Fraction of Activity that is C-14) (Efficiency for C-14)

Assuming that $\sim 50\%$ of the total surface activity is from C-14 (as discussed in Item 2 above), the total detection efficiency for surface activity would be reduced from 0.2 (for C-14 alone) to 0.1. This would have the net effect of increasing all of the vendor's interpreted survey results (dpm) by a factor of 2. However, even with this efficiency adjustment, no areas were

reported to remain at any levels exceeding NRC pre-approved screening DCGLs in Table B.1 of NUREG-1757, Vol. 1, Rev. 2. (additional discussion in Item 11 of **Enclosure 5**).

Facility's response to Point 3

The [portable scanning] survey instrumentation used was not sensitive to the very low-energy beta emitted by H-3. Therefore, smear analysis was used for evaluating and identifying residual H-3 contamination. Both Cl-36 and Fe-55 were not identified during the HSA as being radionuclides of concern. Regardless, we concur with Dr. Huston's evaluations demonstrating sufficient detection capability even if these radionuclides were present.

4. The report did not include a comparison of "Background" and "Investigation Levels" to release limits for the different detection techniques employed. It appears that a level of "2 x background" was used to label surfaces as "contaminated" above background. To provide additional information, the reviewer performed calculations using data supplied in the report to determine these levels in "dpm/100 cm²" so they could be compared to the release limits.

In the first table the total efficiency was assigned as 0.1, consistent with the discussion in Item 3 above. This assumes that about half of the activity present is from C-14 (see Item 1). This is also supported by some of the swipe samples which had positive activity. The second table assigns an efficiency of 0.2 (equal to the efficiency for C-14). The Investigation Level, traditional "static count" Minimum Detectable Concentration (MDC_{static}), and scan MDC were calculated using the following equations (where *b* is the background count rate, cpm):

Investigation level (net
$$dpm/100 \text{cm}^2$$
) = $\frac{(2b-b)}{Efficiency_{total}} * \frac{Detector\ Probe\ Area}{100\ cm^2}$

$$MDC_{static}(dpm/100cm^2) = \frac{3 + 4.65\sqrt{b}}{Efficiency_{total}} * \frac{Detector\ Probe\ Area}{100\ cm^2}$$
 (for 1 minute count)

$$MDC_{scan}(dpm/100cm^{2}) = \frac{d'\frac{\sqrt{b_{i}}}{i\sqrt{p}}}{Efficiency_{total}} * \frac{Detector\ Probe\ Area}{100\ cm^{2}}$$

Where:

b_i is the number of background counts in observation interval i (2 seconds used)
d' is the "detectability index" (2.32 from Table 6.5 in MARSSIM, based on tolerance rates of 95% for true positives 75% for false positives).

p is the surveyor efficiency relative to the ideal observer (0.5 from MARSSIM, Section 6.7.2.1)

Media Ludlum 43-37-1 (771	Bkgd (cpm)			2xBkg (dpm/100cm²)
Sealed concrete	618	154	579	802
Ceramic Tile	929	188	710	1205
8-inch Tile	1240	216	821	1608
Ludlum 43-68 (126 cm	n2) (Using To	otal Efficiency = 0.1)	
Lab Bench	239	594	2205	1897

Media Ludlum 43-37-1 (771 d	Bkgd (cpm)		MDC _{scan} (dpm/100cm ²) .2)	2xBkg (dpm/100cm²)
Sealed concrete	618	77	290	401
Ceramic Tile	929	94	355	602
8-inch Tile	1240	108	410	804
Ludlum 43-68 (126 cn				
Lab Bench	239	297	1102	948

The above data indicate that surface measurement techniques (using a 2x background decision point) are generally comparable to the scan MDC values that would have been obtained if a strict MARSSIM approach had been used. Also a"2 times background" action level has sensitivity necessary to identify contamination at both the NRC License Termination Screening Levels (i.e., 1.20E+8 dpm/100cm² for H-3, 3.70E+6 dpm/100cm² for C-14, 5.00E+5 dpm/100cm² for Cl-36, and 4.50E+6 dpm/100 cm² for Fe-55, in Table B.1 of NUREG-1757, Vol. 1, Rev. 2) and at the facility's adopted lower release criteria based on NUREG-1556, Volume 7, Appendix Q (i.e., direct levels < 5000 dpm/100 cm² averaged over 1 m² and < 15,000 dpm/100 cm² maximum surface contamination).

The wipe sample techniques (with background generally below about 10 cpm, efficiencies above about 0.5, nominal 1 minute sample count time, and assumed wipe area of 100 cm²) were associated with MDCs < ~40 dpm/100 cm². This is well below the facility's adopted release criteria of 1000 dpm/100 cm² for removable beta-gamma activity (from NRC Reg Guide 1.86). This is also much less than 0.1 times the NUREG-1757 screening levels (0.1 is what the authors assumed for the removable fraction of activity in deriving NRC screening levels in NUREG-1757).

In conclusion, the measurement techniques have the necessary sensitivity to identify contamination above the release criteria.

Facility's response to Point 4*

We concur with the additional analysis as performed by Dr. Huston; our instrumentation and survey techniques were selected precisely to obtain these results; however, a rigorous analysis was not performed rather was based on our long experience with the clean-up levels and the techniques and instrumentation required to attain sufficient measurement sensitivity to demonstrate compliance with the clean-up criteria.

- *Note: Additional discussion and calculation of "Scan MDCs" were added after the facility reviewed and commented; however, final conclusions were unchanged; thus no follow-up comments were sought from the facility. (T. Huston, NHPP Reviewer)
- 5. Reviewer Comments on Attachment 1, Room Survey Sheets. Several of the survey sheets in the report give the reviewer the impression that contamination above release limits could still remain in the area. It is clear that some of these sheets were not updated to reflect the final status of the areas (i.e., remediation activities on June 28, 2007, and associated follow-up surveys). The following are specific references and comments on these sheets to help resolve these discrepancies:
 - a. Room 113: Text in the body of the report (Sections 5.0 and 6.0) states the contaminated floor sections were removed (disposed of as radioactive waste) and the area was resurveyed and no detectable contamination above background was found.
 - b. Room 113A: Text in the body of the report (Sections 5.0 and 6.0) indicates the "Speed Concentrator" was removed from the room and disposed of as radioactive waste. It states that other surfaces were not impacted by the Speed Concentrator.
 - c. Room 113B: Text in the body of the report (Sections 5.0 and 6.0) indicates remediation activities were performed in the area and that only one small area (~400 cm²) of detectable activity remained (sink top ~ 3600 dpm/100 cm²), but that it was below release criteria. Applying a factor of 2 to this result (to address potential presence of other nuclides) yields 7200 dpm/100 cm² (fixed) over ~400 cm². Averaging this over 1 m² (10,000 cm²), would reduce the level below 5000 dpm/100 cm² and would be well below all applicable release criteria.
 - d. Room 113C: Text in body of report (Sections 5.0 and 6.0) indicates the refrigerator/ freezer was decontaminated and final surveys showed no detectable activity above background.
 - e. Room 113D: Text in body of report (Sections 5.0 and 6.0) indicates the area was remediated and final surveys showed no contamination above background.
 - f. Room 113/A/B/C/D Objects: This is the last survey sheet in Attachment 1 of the document. The text in Sections 5.0 and 6.0 indicates remediation occurred for all contaminated objects and that only in the case of Room 113B (see Item c above) was contamination still present above background levels.

Facility's response to Point 5

We concur with Dr. Huston's evaluation. There are no open issues concerning residual radioactive materials above the clean-up criteria in Building 72. The existing survey sets for the Room 113 complex can be annotated as detailed here if the review staff feels it is necessary.

Enclosure 5

Additional Facility Details for Release of Building 72 (Hampton, Virginia)

Note: This enclosure contains information that may be useful for preparing an Environmental Assessment and Federal Register Notice for the requested action.

1. Description of facility to be released.

The facility to be released is a separate building, Building 72, located at the Hampton VA Medical Center (HVAMC). HVAMC is a United States Department of Veterans Affairs facility with a street address of 100 Emancipation Drive, Hampton, Virginia. The HVAMC site encompasses approximately 85 acres and contains over 25 buildings and multiple parking areas. Building 72 was constructed in 1908 and was originally used as a dining room for soldiers. It was converted into a research facility in 1974. Building 72 is a single floor, brick construction with a wooden frame attic. Additional details of Building 72 are provided in Section 1.1 of the assessment included as **Enclosure 1**.

2. Date license initially issued.

The first license for use of radioactive materials at HVAMC was issued August 1, 1961, by the US Atomic Energy Commission (AEC). The License No. was 45-7569-1. Following promulgation of the Energy Reorganization Act of 1974, the US Nuclear Regulatory Commission (NRC) was established and assumed regulatory authority for use of radioactive materials at the site. On March 17, 2003, NRC issued a broad-scope Master Materials License (MML) to the Department of Veterans Affairs (VA). Concurrent with issuance of the MML, VA facility licenses were converted into "Materials Permits," which are issued under various conditions of the MML. The Material Permits are administered by the Veterans Health Administration's National Health Physics Program (NHPP), located in North Little Rock, Arkansas. The use of radioactive materials at HVAMC is now authorized under VHA Materials Permit # 45-07569-01.

3. Type of licensed material used.

HVAMC has used licensed material for both medical diagnostic and treatment purposes and research purposes, including animal studies. Building 72 was formerly a dining hall; it began to be used as used as a research facility in 1974. Based on the Historical Site Assessment (Enclosure 1), it is presumed that no radioactive materials were introduced into the building until 1974. Enclosure 4 (Item 2) provides a listing of radionuclides that were authorized to be used for research purposes. Based on that information and Enclosure 1, the materials of primary concern with respect to releasing Building 72 are H-3 and C-14.

4. Type of licensed activities engaged in.

With respect to all licensed activities at HVAMC, the facility has been engaged in both research and medical use. With respect to Building 72, the authorized activities included *in vitro*, research, and animal studies.

5. Site description: size (square feet, square miles, acres), structures (labs, office space), surrounding area (residential, commercial, industrial, mixed).

Building 72 is approximately 10,600 square feet and consists of vacant labs, offices, bathrooms, corridors, and storage areas. The building is on VA-controlled land and surrounded by other VA-controlled buildings. Additional details are provided in Section 1.1 of **Enclosure 1**.

6. Size and description of affected area(s): building, rooms, areas, size.

The following rooms were considered to be the primary affected areas and subject to 100% surface scanning: 112, 112A, 113, 113A, 113B, 113C, 113D, 124, and 124A. Other rooms in the building were subjected to 25% to 40% surface scanning. In addition, smear samples were collected from all rooms. Attachment 4.0 of **Enclosure 1** provides the surface area (SQFT) for the rooms in Building 72.

7. Date licensed activities ceased.

Except for some final cleaning and disposal efforts associated with final status surveys (during June 2007), the last recorded usage and disposal of radioactive materials in Building 72 was during calendar year 2001 (Section 1.2 in **Enclosure 1**). Licensed materials will continue to be used in other buildings at the facility in accordance with the facility's VHA Materials Permit.

8. Date decontamination activities started.

Decontamination efforts began before or during the first quarter of 2001, based on disposal records (discussed in Section 1.2 in **Enclosure 1**). Additional decontamination efforts were performed on June 28, 2007, in response to initial closeout surveys in the building.

9. Date(s) final status surveys performed and areas surveyed.

Final status surveys were performed by a contract firm in a phased approach. Dates of these surveys (provided in **Enclosure 1**) were February 22 and 23, 2007; March 21 and 22, 2007; and June 28, 2007, with completion being on this latter date.

10. List of radionuclides used with half-life greater than 120 days.

According to the Historical Site Assessment (Section 1.0 of Enclosure 1), radionuclides recorded to have been used in Building 72 with half-life greater than 120 days include H-3 and C-14.

11. What DCGLs were used?

Permit commitments require the facility to meet criteria in NUREG-1556, Volume 7, Appendix Q for unrestricted release of research facilities. These criteria are restated below as information.

For equipment	released fo	r unrestri <i>cted</i>	luse (from	Table O	2 for 1	heta emitters).
i or equipment	rereased to	1 diffestiteted	use (mom	T WOIC Q	.2, 101	seta emitters.

Nuclide ^a	Average ^{b, c}	Maximum ^{b, d}	Removable ^{b, •}
Beta-gamma emitters (nuclides with decay modes other than alpha emission or spontaneous fission) except Sr-90 and others noted above.	83.3 Bq*/100 cm ² (5,000 dpm/100 cm ²)	250 Bq/100 cm ² (15,000 dpm /100 cm ²)	16.7 Bq/100 cm ² (1,000 dpm/100 cm ²)

- 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.
- As used in this table, dpm (disintegration 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.
- 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.
- The maximum contamination level applies to an area of not more than 100 cm².
- * The amount of removable radioactive material per 100 cm² of surface area should be determined by wiping that area with 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, the pertinent levels should be reduced proportionally and the entire surface should be wiped.
- * 1 Bq = 1 Disintegration per second

For building surfaces (from Table Q.3, values for H-3 and C-14):

Radionuclid e	Symbol	Screening levels for unrestricted release (dpm/100 cm ²)
Hydrogen-3 (Tritium)	H-3	1.2 x 10 ⁸
Carbon-14	C-14	3.7 x 10 ⁶

According to NUREG-1556, the screening values above represent total surface concentrations of individual radionuclides that would be deemed in compliance with the 0.25 mSv/yr (25 mrem/yr) unrestricted release dose limit in 10 CFR 20.1402. For radionuclide mixtures, either a sum of fractions rule could be applied or the more restrictive limit (for C-14) simply adopted and applied to the sum of both contaminants.

The facility arbitrarily chose to apply release criteria from Regulatory Guide 1.86 (provided in Attachment 2.0 of Enclosure 1). For H-3 and C-14, the criteria in that document are much more restrictive than the values provided above for NUREG-1556, Vol. 7, Appendix Q.

In addition to release criteria above, reasonable efforts must be taken to reduce any residual contamination to levels that are ALARA. Based on the discussion in Enclosure 1 and on a site visit by NHPP following all clean-up and survey activities, it is believed that reasonable efforts were taken to reduce contamination levels to ALARA levels.

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