JUN - 8 1994

License No. 08-00482-03 Docket No: 030-03917 Control No: 116499

Department of Health & Human Services

ATTN:

Sharon Smith Holston Associate Commissioner

for Management

Food and Drug Administration Rockville, Maryland 20857

Subject: Financial Assurance for Decommissioning

This is in reference to the letter dated November 16, 1992, with enclosed Decommissioning Funding Plan and Statement of Intent, and letters dated January 13, 1994 and April 29, 1994 which provide additional information, for the provision of financial assurance for License No. 08-00482-03. We have reviewed these documents and have no further questions at this time.

Based on the information provided in the above referenced documents, you are presently in compliance with the financial assurance requirements outlined in the decommissioning rule in 10 CFR 30.35. Please note that financial assurance cerification and all associated documentation are required to be updated with significant changes in operation and with each application for livense renewal.

If you have any questions, please contact David Everhart, of my staff, at (610) 337-6936.

Thank you for your cooperation in this matter.

Sincerely,

Original Signed By: Mohamed M. Shanbaky

Mohamed M. Shanbaky, Chief Research and Development Section Division of Radiation Safety and Safeguards

OFFICIAL RECORD COPY - C:\BACKUP.P1\FDA22.FA - 05/27/94

9406230169 940608 PDR ADOCK 03003917 B FDR cc:

U.S. Food and Drug Administration ATTN: Dorie Waddick Radiation Safety Officer Safety Office, Mail Code HFS-657 Room 6113 200 "C" Street, S.W. Washington, DC 20204 bcc:

M. Shanbaky, RI

D. Everhart, RI

DRSS:RI Everhart

05/20001

DRSS:RI Shanbaky

4 05/27/94

NOTE TO DMB:

THE ATTACHED DOCUMENTS ARE TO BE PROCESSED AS <u>ONE</u> MATERIALS LICENSING PACKAGE.

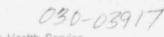
LICENSE NUMBER: 08-00482-03

DOCKET NUMBER: 030-03917

CONTROL NUMBER: 116499

THIS SHEET MAY BE DISCARDED AFTER PROCESSING.

THANK YOU!



1115#16

Public Health Service

Food and Drug Administration Washington DC 20204

DEPART

April 29, 1994

Nuclear Regulatory Commission Region I 475 Allendale Road King of Prussia, PA 19406-1415

ATTN: David Everhart

Research and Development Section

Division of Radiation Safety and Safeguards

Subject: Decommissioning Funding Plan Issues

Dear Mr. Everhart:

This correspondence follows our recent phone conversations related to your November 2, 1993 letter requesting additional information for the Decommissioning Funding Plan for the Food and Drug Administration NRC License No. 08-00482-03 (Docket No. 030-03917, Control No. 116499). At your request, I personally researched further into the radioactive material use records for details about the research conducted at the FDA Beltsville Research Facility (BRF), previously referred to as the Special Pharmacological Animal Laboratory (SPAL), in the 1967 to 1974 time period. Based on the information available to review, it is improbable that any radioactive material was illegally buried at the site. The following information may also help you assess the low levels of radioactivity used at the facility that may have in part entered the septic system prior to connection to the WSSC.

An August 70, 1971 Report on the Handling of Radioisotopes by John Huff, Health Physicist and Radiation Safety Officer, includes a History of the Use and Control of Radioactive Materials at FDA Laboratories. Most of the information pertains to Federal Building 8 in Washington, DC. However, paragraph 2.4 - SPAL on page 5 reads as follows:

"We list 3 employees at the Special Pharmacological Animal Laboratory (SPAL) in Beltsville (as users of RAM); this number may increase when existing proposals are carried out. The special layout of this facility seems to preclude any major changes in their use of radionuclides".

September 20, 1971 comments to that report by Edward J. Van Loon, Ph.D. Chief, SPAL, regarding Paragraph 2.4 - SPAL (Attachment A) indicated that he agreed with that section of the report. He stated that their Beta emitter usage continues at a low level -- radioactive substrates for enzyme assay. Also he indicated that Cadmium and Mercury would be used for future research in 1972 if approved by Dr. Huff. Two Isotope Committee Approval Request Forms from 1972 were found in the records that provide information on the Mercury studies with pigs. (Attachment B)

//6499 MAY -2 1994 Page 2 - Decommissioning Funding Plan Issues

Dr. Huff's report also stated in paragraph 1.5 ECONOMICS a.) that "the dispersed laboratories greatly increase the cost of hot waste collection, delivery of radioactive shipments, film badge service and other required services". This seems to indicate that arrangements were available to dispose of the waste. However, no record of a waste contractor was found for this early time period.

The FDA/CFSAN license amendments no. 26 and 27 authorize licensee to dispose of byproduct material by incineration pursuant to Sections 20.106(b) and 20.302, 10 CFR 20. Although no records of incineration were found for this period, the phone interview with Dr. Van Loon on January 28, 1994 indicated that the animals involved in radioactive research were disposed of in the incinerator at SPAL (Attachment C). He could not remember specific issues concerning disposal of materials from that time period.

My review of the dosimetry records shows that 4 employees from the SPAL facility were added to the TLD list in May 1972. None were listed prior to that time.

I found no records of shipments of radioactive material for the SPAL facility for the 1967 to 1974 time period.

Based on the review, it appears that perhaps only three people were working with very low levels of Tritium and Carbon-14 as radioactive substrates for enzyme assays prior to 1971. An incinerator was available for disposal of carcasses at SPAL and Dr. Huff's report indicates disposal service for FDA laboratories which would include SPAL. No records were found for any discharge to the septic system for this period. It also appears improbable that any radioactive material was intentionally buried in the woods. The 1975 and 1976 log notes from the next RSO referenced disposal provisions for liquid scintillation vials and the names of a few new authorized users of RAM.

One additional item I would like to clarify is the information communicated to you in our January 13, 1994 phone call and reported in our January 14, 1994 response to the NRC November 2, 1993 memo. We were concerned that SPAL may not have been authorized to use radioactive material until 1975. Information presented in an Appendix C (attachment D) submitted with the FDA Application for Byproduct Material License, April 24, 1969 helps to resolve this issue and is presented below.

Ttem 1. (b) IV. of Appendix C:
 FDA Special Pharmaceutical Animal Laboratory (SPAL),
 Agricultural Research Station, Beltsville, Maryland 20204

Page 3 - Decommissioning Funding Plan Issues The appendix C clarifies that SPAL was authorized to use radioactive materials on our FDA license Amendment No. 26 dated March 1967 (See Attachment E). It appears that the FDA Special Pharmaceutical Animal Laboratory (SPAL) was not typed on the actual license amendment received from the NRC. Only the title "Agricultural Research Center" was entered. The title causes some confusion as another FDA facility serving the Center for Veterinary Medicine located on Department of Agriculture land was later added to our FDA/CFSAN license. Based on the review, to the best of our knowledge radioactive research was limited to very low activities of low-level radioactive material conducted by just a few researchers. In 1978 the number of researchers using radioactive materials increased at SPAL. I did find a radioactive and chemical waste contract for disposal service beginning in April 1978. There have been contracts arrangements for disposal since then. If you have any further questions regarding this issue please call me at (202) 205-4281. blow Waddick Dorie Waddick Radiation Safety Officer cc: James McKenna James Trickett Janice Oliver Michael Terpilak Naresh Chawla

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

ATTACHMENT A

PUBLIC HEALTH SERVICE FOOD AND DRUG ADMINISTRATION

Date:

September 20, 1971

Reply to Attn of:

BF-158

Subject:

Comments on Report on the Handling of Radioisotopes

To:

Dr. Edward O. Haenni, Director Division of Chemistry and Physics

Paragraph 2.4 - SPAL - on page 5 pretty well defines our future regarding radioactive isotopes. Our B emitter usage continues at a low level -- radioactive substrates for enzyme assay.

Radioactive Cd will be used for some recently approved research and radioactive Hg will probably be used in 1972. Dr. Huff has been, is and will be requested to approve our radioactive isotope usage.

Edward J. Van Loon, Ph.D.

Chief/SPAI,

cc: BF-158

EJVanLoon:gr 9/20/71

APPLICATE B

ISOTOPE COMMETTED APPROVAL REQUEST	ISOTOPE	COMMITTEE	ANDROVILL	White The San Air Air as	
------------------------------------	---------	-----------	-----------	--------------------------	--

DATE February 22, 1972

Dr. P.D. La Fleur/N.B.S.

Dr. E.J. Van Loon/S.P.A.L.

proposes to:

Principal Investigator

Bitches and sows will be put on 100 and 50 ug/kg/day, respectively, of MMC for approximately 30 days prior to breeding and this dosage will continue until they are sacrificed just before delivery.

The females will be bred at the appropriate time. During the organogenesis period the animals will be administered 25 uC of tagged MMC with their "cold" MMC (7-8 days of isotope administration).

At term the animals will be sacrificed and complete autops'es performed. Tissue radioactivity will be obtained on fresh and freeze-dried specimens. Brain and kidney tissues will be sectioned carefully so as to permit autoradiograms to be made on the

The data derived from this study will permit half-life and tissue distribution calculation for the mother and placental transfer and tissue incorporation for the embryo.

The experiment may be changed after initial values have been obtained such that the mothers may be sacrificed at various stages of pregnancy rather than carry out the full term experiment since 60+ (dogs) and 115+ (pigs) days are required and this is 1.25 and 2.5 half-lives of the isotope.

involved:

3 20 0 1 0 1 2 2	Curies	Form	Curies/Oran
203 Hg	10 mC (max.)	Methyl Mercury Chloride	1 uC/ugm
(Iso	tope furnish	ed by NBS)	
	***		-
	The state of the s	ximum permitted at time of rome	val from facility
supplying so	ores.		
		uation will be	

TTACHEENT

5. The data generated will allow: (a) NMC and/or Hg tissue loss during freeze-drying of tissues to be determined; (b) blood and tissue half-life determinations; (c) brain and kidney Hg and NMC concentration sites to be accurately determined anatomically.

NOTE: All blood and tissues isotope analyses will be carried out at the NBS facility. The tissue autoradiograms will be prepared at SPAL after the tissues have been freeze-dried at NBS.

APPRINTS 1

		SOFORE COMMITTED APPROVAL REQUEST
	Dr. E.J. Va	DATE February 22, 1972 In Loon/S.P.A.L. er/S.P.A.L. proposes to:
1.	Administer tag	Tavestigator ged methyl mercuric chloride (MMC) to weaned piglets for 10 day 25 uC per day for a total dose of 250 uC per piglet and for eig al animals the total dose of isotope used would be 2 mC.
2.	Blood samples administration	will be obtained at frequent intervals during and asset
3.	dose of tagged	e sacrificed as follows: (a) two (2) piglets 24 hours (1 day) e of tagged MMC; (b) two (2) piglets approx. 10 days after last MMC; (c) two (2) piglets approx. 20-30 days after last dose of two (2) piglets approx. 40-60 days after last dose of tagged 1
4.	At sacrifice s isotope analys	everal tissues will be removed and sectioned so as to permit is before and after freeze-drying. The brain and kidney will be fully to allow tissue autoradiograms to be made on the frozen
	A. S. S. S. S. S. S. S.	(continued on attached sheet) If quantities of radioactive material are estimated to be
	1.0 00 000	Constant
	203 He	Curios Form Curios/Gran
	203 _{Hg}	2mC Methyl Mercury Chloride 1 uC/ugm
,	-ecoed wil	2mC Methyl Mercury Chloride 1 uC/ugm (Isotope furnished by NBS) 1 be kept of the amounts and dates of
UL	record with	2mc Methyl Mercury Chloride 1 uC/ugm (Isotope furnished by NBS) 1 be kept of the amounts and dates of unsferred between NBS and FDA The
UL	record with	2mc Methyl Mercury Chloride 1 uC/ugm (Isotope furnished by NBS) 1 be kept of the amounts and dates of unsferred between NBS and FDA The
UL	record with	2mc Methyl Mercury Chloride 1 uC/ugm (Isotope furnished by NBS) (be kept of the amounts and dates of msferred between NBS and FDA. The Phisist will receive a copy of this recommon maximum permitted at time of removal from specific.
D	- Pecard will - lides tra A Health 3. supplying no	2mc Methyl Mercury Chloride 1 uC/ugm (Isotope furnished by NBS) (be kept of the amounts and dates of msferred between NBS and FDA. The Phisist will receive a copy of this recommon maximum permitted at time of removal from specific.

6. Exposure of other persons will	be prevented by standard isotope handling
techniques.	
7. on of concasinac	ion will be provensed by isolation of test
animals.	
8. The operation is schedules to 1	wagin wh or about 3/1/72 and will be
earried out kx at SPAL - Coun	tire to sues at NBS.
S Upon recul	aterial on be utilized for the above
purpose, Y (We) shall be res	ponsible to prevent the exposure of any
individual to the radiacion the	erefrom in excess of permissible limits.
(We) have read,	or with and will comply with Title 10,
Part 20 Cede of Paderal Regula	cions (Standards for Protection Against
Sudiction), and the ADA Radiol	Eugens Willer
Endorsement I (Division Director)	Encorsement II John B Huff 28 Feb 1972
	ive material as described above until
(Expiration Date)	by the Isotope Committee.
	Approval (Radiological Safery Officer)
This request is restricted(),	disapproved(), for the following recsons:
	The second section of the second seco
Y Y	
	\$437.00
	(Rudiological Safety Officer)

April 24, 1972 Division of Materials Licensing U.S. Atomic Energy Commission Washington, D.C. 20545 Attn: R. E. Brinkman Gentlemen: Please smend our Byproduct Material License No. 8-482-3 (E 74) to permit us to accept radioactive samples produced at the National Bureau of Standards Reactor (License No. TR-5) and to transport these samples from MBS to our facilities for analysis. Thank you for your attention to this request. 1.0 Very truly yours E. O. Haenni, Ph.D. Chairman, Radiation Safety Committee 04 cc: BF-10
BF-14

1/21/72 JBHUFF: jjs cc: BF-10 BF-14 (2)

Interview with Dr. E.J. Van Loon on January 28, 1994.

Scott Delicate and I interviewed Dr. Van Loon per telephone. He was employed at the Beltsville Facility Between early 1988 until his retirement in 1975. He did not remember many details of the research that was conducted at the SPAL. He mentioned that some C-14 was used in microcurie quantities. He did not recollect any research with tritium. Work done with Co or Cd was also not remembered. He told us that all work was done under the downtown license. Purchases had to be made through the downtown office.

Mostly toxicology studies were done using pigs and dogs. Per experiment 35-50 animals would be used. These were disposed of in the incinerator. The service crew was involved in operating this incinerator and he did not remember specific issues concerning disposal of materials.

We did tell him that we would summerize our conversation on paper and send a copy to him.

W. Scott Delicate

Project manager

Dr. Judith A. Glazener

Concurrence by Dr. E.J. Van Loon

APPENDIX C

The following is copied from our Application for Byproduct Material License, April 24, 1969:

Attachment

Application for Dyproduct Material License

U. S. Department of Health, Education and Welfare Food and Drug Administration

- I. FB-8, 200 C Street, S. W. Washington, D. C. 20204 1. (b)
 - II. 501 Fires Street, S. E., Mushington, D. C. 20204
 - III. Couth USDA Building, 12th Street and Independence Avenue, N. W., Mashington, D. C. 20204
 - IV. FDA Special Pharmaceutical Amicul Laboratory (SPAL), Agricultural Research Station, Beltsville, Maryland 20204
- As per the Food and Drug Administration "Cuide for Radiological 6 . - 9 . Safety," individual weers of syproduct material will be approved by the Radic sotope Committee or its authorized representative. Pacilities and safety measures will also be reviewed by this Committee. The Radioisotope Committee consists of the following personnel whose pertinent training and experience is described below.

Dr. Edward C. Haenni, Chairman

Mr. Robert E. Simpson, Radiation Safety Officer

Mrs. Patricia D. Roecklein, Health Physicist

Mr. Joseph P. F. Lambert, Muclear Engineer

Mr. Ralph Craig, FDA Sandty Officer and representative of the Office of the Commissioner

Mr. Leonard A. Ford, Radicchemist

And the following is copied from the Guide for Radiological Safety cited in 8.-9 above, page 11:

Each individual listed on the request shall submit a written resume of his (her) previous experience with radioactive materials and/or radiation sources, training, and other pertinent qualifications indicating his (her) competence to deal safely with radiation and radioactivity. This statement is to be signed by the cognizant Division Director and must be filed with the Isotope Committee before approval can be given. The resumes will be kept on file by the Committee for its use in evaluating any future request of the individual and may be incorporated in the approval request by reference. U. S. ATOMIC ENERGY COMMISSION LICENSE Page 1 of

BYPRODUCT MATERIAL LICENS

mendment No. 29 This Copy Is For Your Files

Pursuant to the Atomic Energy Act of 1954 and Title 10, Code of Federal Regulations, Chapter 1, Parts 30, 32, 33, 34, and 35, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, own, possess, transfer and import byproduct material listed below; and to use such byproduct material for the purpose(s) and at the place(s) designated below. This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, and is subject to all applicable rules, regulations, and orders of the Atomic Energy Commission now or hereafter in effect and to any conditions specified below.

Licensee

1. Department of Health, Education, and Welfare Food and Drug Administration

2. 200 G Street, S.W. Washington, D. C.

In accordance with application dated April 24, 1969,

- 3. License number 08-00482-03 is amended in its entirety to read as follows:
- 4. Expiration date May 31, 1974
- 5. Reference No.

6. Byproduct material (element and mass number)	7. Chemical and/or physical form	8. Maximum amount of radioac- tivity which licensee may possess at any one time
A. Any byproduct material between Atomic Nos. 3 and	A. Any	A. Not to exceed 200 millicuries of each radionuclide
83, inclusive B. Hydrogen 3 C. Americium 241	B. Any C. Any	B. 10 curies total C. 100 millicuries total

Authorized use

A. through C. Research and Development as defined in 10 CFR 30.

CONDITIONS

- 10. Byproduct material may only be used at FB-8, 200 C Street, S. W., Washington, D. C.; 501 First Street, S.E., Washington, D. C.; USDA, 12th and Independence, S.W., Washington, D. C.; and Food and Drug Administration facilities at Agricultural Research Center, Beltsville, Maryland.
- 11. The licensee shall comply with the provisions of Title 10, Chapter 1, Code of Federal Regulations, Part 20, "Standards for Protection Against Radiation."
- 12. Byproduct material shall be used by, or under the supervision of, individuals designated by the licensee's isotopes committee.

(Continued)

License Number_08-00482-03

CONDITIONS

Amendment No. 29

- 13. A(1) Each sealed source containing byproduct material, other than Hydrogen 3, with a half-life greater than thirty days and in any form other than gas shall be tested for leakage and/or contamination at intervals not to exceed six months. In the absence of a certificate from a transferor indicating that a test has been made within six months prior to the transfer, the sealed source shall not be put into use until tested.
 - (2) Notwithstanding the periodic leak test required by the preceding paragraph, any licensed sealed source containing byproduct material is exempted from periodic leak tests provided the quantity of byproduct material contained in the source does not exceed ten times the quantity specified for the byproduct material in Column II, Schedule A, Section 31.100, 10 CFR 31.
 - (3) The periodic leak test required by this condition does not apply to sealed sources that are stored and not being used. The sources excepted from this test shall be tested for leakage prior to any use or transfer to another person unless they have been leak tested within six months prior to the date of use or transfer.
 - B. The test shall be capable of detecting the presence of 0.005 microcurie of radioactive material on the test sample. The test sample shall be taken from the sealed source or from the surfaces of the device in which the sealed source is permanently mounted or stored on which one might expect contamination to accumulate. Records of leak test results shall be kept in units of microcuries and maintained for inspection by the Commission.
 - C. If the test reveals the presence of 0.005 microcurie or more of removable contamination, the licensee shall immediately withdraw the sealed source from use and shall cause it to be decontaminated and repaired or to be disposed of in accordance with Commission regulations. A report shall be filed within 5 days of the test with the Director, Division of Materials Licensing, U. S. Atomic Energy Commission, Washington, D. C., 20545, describing the equipment involved, the test results, and the corrective action taken. A copy of such report shall also be sent to the Director, Region I, Division of Compliance, USAEC, 970 Broad Street, Newark, New Jersey, 07102.

Supplementary Sheet

CONDITIONS

License Number 08-00482-03

Page 3 of 3 Pages

Amendment No. 29

(Continued)

- 14. Pursuant to Sections 20.106(b) and 20.302, 10 GFR 20, the licensee is authorized to dispose of byproduct material by incineration provided the gaseous effluent from incineration does not exceed the limits specified for air in Appendix B, Table II, 10 GFR 20. Ash residues may be disposed of as ordinary waste provided appropriate surveys pursuant to 20.201 are made to determine that concentrations of byproduct material appearing in the ash residues do not exceed the concentrations (in terms of microcuries per gram) specified for water in Appendix B, Table II, 10 GFR 20.
- 15. The transportation of AEC-licensed material shall be subject to all applicable regulations of the Department of Transportation and other agencies of the United States having jurisdiction.
 - When Department of Transportation regulations in Title 49, Chapter 1, Code of Federal Regulations, Parts 173 179 are not applicable to shipments by land of AEC-licensed material by reason of the fact that the transportation does not occur in interstate or foreign commerce, (1) the transportation shall be in accordance with the requirements relating to packaging of radioactive material, marking and labeling of the package, placarding of the transportation vehicle, and accident reporting set forth in the regulations of the Department of Transportation in \$\$ 173.389 173.399 173.402, 173.414, 173.427, 49 CFR Part 173, "Shippers," and \$\$ 177.823, 177.842, 177.843, 177.861, 49 CFR Part 177, "Regulations Applying to Shipments Made by Way of Common, Contract, or Private Carriers By Public Highways," and (2) any requests for modifications or exceptions to those requirements, and any notifications referred to in those requirements shall be filed with, or made to, the Atomic Energy Commission.
- 16. Except as specifically provided otherwise by this license, the licensee shall possess and use byproduct material described in Items 6, 7, and 8 of this license in accordance with statements, representations, and procedures contained in application dated April 24, 1969.

For the U.S. Atomic Energy Commission

Isotopes Branch

Division of Materials Licensing Washington, D. C. 20548

JUN 1 3 1969

Date ...

38

ORM AEC-374

S. ATOMIC ENERGY COMMISSION OF THE STREET OF

License No. 08-00482-03
Page 1 of 3 Pages

Amendment No. 26

This Copy is For Your Files

Pursuant to the Atomic Energy Act of 1954 and Title 10, Code of Federal Regulations, Chapter 1, Parts 30, 32, 33, 34, and 35, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, own, possess, transfer and import byproduct material listed below; and to use such byproduct material for the purpose(s) and at the place(s) designated below. This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, and is subject to all applicable rules, regulations, and orders of the Atomic Energy Commission now or hereafter in effect and to any conditions specified below.

Licensee

- 1. Department of Health, Education and Welfare Food and Drug Administration
- 2. 200 C Street, S. W. Washington, D. C. 20204

In accordance with application dated March 15, 1967

- 3. License number 08-00482-03 is amended in its entirety to read as follows:
- 4. Expiration date May 31, 1969
- 5. Reference No.

6. Byproduct material (element and mass number)

material between

Atomic Nos. 1 and

- Chemical and/or physical form
- A. Any

- Maximum amount of radioactivity which licensee may possess at any one time
 - A. Not to exceed 200 millicuries of each radionuclide, except; Hydrogen 3 1 curie

9. Authorized use

83. inclusive

A. Any byproduct

A. Research and Development as defined in 10 CFR 30.

CONDITIONS

- 10. Byproduct material may only be used at FB-8, 200 C Street, S. W., Washington, D. C., 501 First Street, S. E., Washington, D. C., USDA, 12th and Independence, S. W., Washington, D. C., and Food and Drug Administration facilities at Agricultural Research Center, Beltsville, Maryland.
- 11. The licensee shall comply with the provisions of Title 10, Part 20, Code of Federal Regulations, Chapter 1, "Standards for Protection Against Radiation."
- 12. Eyproduct material shall be used by, or under the supervision of, individuals designated by the licensee's isotopes committee.

BYPRODUCT MATERIAL LICENSE

Supplementary Sheet

License Number08-00482-03

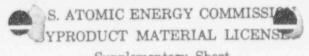
Page 2 of 3 Pages

Amendment No. 26

ntinued)

CONDITIONS

- A. (1) Each sealed source containing byproduct material, other than Hydrogen 3, with a half-life greater than thirty days and in any form other than gas shall be tested for leakage and/or contamination at intervals not to exceed six months. In the absence of a certificate from a transferor indicating that a test has been made within six months prior to the transfer, the sealed source shall not be put into use until tested.
 - (2) Notwithstanding the periodic leak test required by the preceding paragraph, any licensed sealed source containing byproduct material is exempted from periodic leak tests provided the quantity of byproduct material contained in the source does not exceed ten times the quantity specified for the byproduct material in Column II, Schedule A, Section 31.100, 10 CFR 31.
 - (3) The periodic leak test required by this condition does not apply to sealed sources that are stored and not being used. The sources excepted from this test shall be tested for leakage prior to any use or transfer to another person unless they have been leak tested within six months prior to the date of use or transfer.
 - B. The test shall be capable of detecting the presence of 0.005 microcurie of radioactive material on the test sample. The test sample shall be taken from the sealed source or from the surfaces of the device in which the sealed source is permanently mounted or stored on which one might expect contamination to accumulate. Records of leak test results shall be kept in units of microcuries and maintained for inspection by the Commission.
 - C. If the test reveals the presence of 0.005 microcurie or more of removable contamination, the licensee shall immediately withdraw the sealed source from use and shall cause it to be decontaminated and repaired or to be disposed of in accordance with Commission regulations. A report shall be filed within 5 days of the test with the Director, Division of Materials Licensing, U. S. Atomic Energy Commission, Washington, D. C., 20545, describing the equipment involved, the test results, and the corrective action taken. A copy of such report shall also be sent to the Director, Region I, Division of Compliance, USAEC, 376 Hudson Street, New York, New York, 10014.



Supplementary Sheet

License Number 08-00482-03

Amendment No. 26

itinued)

CONDITIONS

- Pursuant to Sections 20.106(b) and 20.302, 10 CFR 20, the licensee is authorized to dispose of byproduct material by incineration provided the gaseous effluent from incineration does not exceed the limits specified for air in Appendix B, Table II, 10 CFR 20. Ash residues may be disposed of as ordinary waste provided appropriate surveys pursuant to 20.201 are made to determine that concentrations of byproduct material appearing in the ash residues do not exceed the concentrations (in terms of microcuries per gram) specified for water in Appendix B, Table II, 10 CFR 20.
- 15. The transportation of AEC-licensed material shall be subject to all applicable regulations of the Interstate Commerce Commission, United States Coast Guard, Federal Aviation Agency, and other agencies of the United States having jurisdiction.

When Interstate Commerce Commission regulations are not applicable to shipments by land of AEC-licensed material by reason of the fact that the transportation does not occur in interstate or foreign commerce, (1) the transportation shall be in accordance with the requirements relating to packaging of radioactive material, marking and labeling of the package, placarding of the transportation vehicle, and accident reporting set forth in the regulations of the Interstate Commerce Commission in \$8 73.391 - 73.325, 49 CFR Part 73, "Regulations Applying to Shippers", and \$8 77.823, 77.860 (c) and (d), 49 CFR Part 77, "Regulations Applying to Shipments Made By Way Of Common, Contract, Or Private Carriers By Public Highways", and (2) any requests for modifications or exceptions to those requirements, any requests for special approvals referred to in those requirements, and any notifications referred to in those requirements shall be filed with, or made to, the Atomic Energy Commission.

16. Except as specifically provided otherwise by this license, the licensee shall possess and use byproduct material described in Items 6, 7, and 8 of this license in accordance with statements, representations, and procedures contained in application dated March 15, 1967.

For the U. S. Atomic Energy Commission

by Isotopes Branch

Division of Materials Licensing Washington, D. C. 20645

MAR 2 7 1967

Date

TELEPHONE CONVERSA	LOG I	DATE:	il 22, 1994
PERSON CALLED:	ORGANIZATION:		TELEPHONE NUMBER:
Dorie Waddick, RSO	U.S.FDA-CI	FSAN	(202) 205-5393
LICENSE NUMBER:	DOCKET NUMBER:		MAIL CONTROL NUMBER:
08-00482-03	030-03917		116499
PERSON CALLING: Kin	David B. E USNRC Red 475 Allenda g of Prussi	gion I	(215) 337-6936 FAX Numbers (215) 337-5269 or (215) 337-5234
subject: Review of findings rega at the Beltsville Research Fa	arding poss: cility (BRF	ible "dumping	" of radioactive waste
SUMMARY:			
Ms. Waddick spoke with severa the BRF during the late 60's the possibility of illegal du would send a report to the Re	and early 7 mping if it	0's who may had occurred	lave some knowledge of
ACTION REQUIRED/TAKEN:			
Wait for report			
SIGNATURE:		DATE	



Public Health Service

Partial Roponse

O30 - O39177

Food and Drug Administration

Rockville MD 20857

K-2

February 25, 1994

State of Maryland Department of the Environment 2500 Broening Highway Baltimore, Maryland 21224

Attn: Harold L. Dye, Jr.
Administrator
Hazardous Waste Program

Dear Mr. Dye:

The Commissioner of Food and Drugs has directed me to respond to your letters dated December 30, 1993, and February 14, 1994. The Food and Drug Administration (FDA) is aware of the various issues raised, and as you were informed in a February 7, 1994, letter from Dr. Naresh Chawla, Chief, FDA Safety Staff, a Technical Review Committee (TRC) has been formed to address these matters as promptly as possible. Other management and technical personnel, such as the four FDA Radiation Safety Officers, will be working in cooperation with this TRC to address your concerns.

The numerous issues identified in your letter have been grouped together in categories and addressed in individual enclosures to this correspondence:

Enclosure A - Environmental Site Assessment Issues/U.S.

Nuclear Regulatory Commission (NRC) Licensing Issues

Enclosure B - FDA's Implementation Plan for Interim Low

Level Radioactive Waste (LLRW) Management

Enclosure C - FDA Administrative Lines of Responsibility
Secretary of Health & Human Services to FDA LLRW

Coordinator

Enclosure A addresses those issues/concerns raised regarding the Environmental Site Assessment (ESA) performed at the FDA's Beltsville site. Enclosure B, which is the FDA's Implementation Plan for LLRW Management, addresses the construction and/or renovation of storage facilities and other strategies concerning LLRW management at all FDA facilities in Maryland generating such waste. The description of facilities, procedures and personnel supporting this plan are also included, as requested. In addition, annual projections for LLRW generation, including mixed wastes, for each of the FDA NRC licensed facilities through 1999 have been provided. The possible Interagency Agreement (IAG) with the U.S. Army Armament, Munitions and Chemical Command (AAMCC) is also addressed. Your request regarding information documenting the organizational structure and administrative lines of responsibility in the FDA are addressed in Enclosure C. There is no such existing organizational chart which addresses this issue. FDA has made its best effort to create the enclosed chart Page 2 - Mr. Harold Dye to delineate the administrative lines of responsibility. I hope that the enclosed information adequately addresses the issues raised in your two letters. Should you have any questions, please feel free to contact Dr. Naresh Chawla at (301) 594-1718. Sincerely, theroughuith tolston Sharon Smith Holston Acting Associate Commissioner for Management and Systems Food and Drug Administration Enclosures (3) cc: Mr. Richard W. Collins, MDE Mr. Mohammed Shanbaky, U.S. NRC Ms. Melanie Christodoulou, P.G. County

ENVIRONMENTAL SITE ASSESSMENT ISSUES/ NUCLEAR REGULATORY COMMISSION (NRC) LICENSING ISSUES ENCLOSURE A - ENVIRONMENTAL SITE ASSESSMENT ISSUES/NUCLEAR REGULATORY COMMISSION (NRC) LICENSING ISSUES*

MDE Concern #1:

A copy of the final environmental assessment was provided to MDE on November 16, 1993. This document did not contain counting times and the appropriate statistical data. MDE learned that FDA had not evaluated the final document for completeness and, accordingly, stated to FDA that MDE did not wish to see the final documents until the FDA could assure MDE that the documents are complete.

Response to Concern #1:

The Phase I and II Environmental Site Assessment Report and related documents provided to the MDZ during the November 16, 1993 meeting concerning the environmental site assessment is considered complete by the General Services Administration (GSA) and FDA. However, FDA recognizes the validity of the issues raised by MDE and will continue to work to obtain information to address these issues.

MDE Concern #2:

The environmental assessment does not address three items/issues:

a) the flow rate of the groundwater on the site, b) the eventual fate of any materials which may have been emptied to the septic tank whether those materials may reconcentrate in another area, and c) the fact that FDA does not have records to show that disposal of radioactive materials via the septic tank was accomplished in compliance with U.S. Nuclear Regulatory Commission (NRC) regulations and the FDA/CFSAN NRC license.

Response to Concern #2:

At the request of the General Services Administration (GSA), the firm of Greenhorne & O'Mara, Inc. (G&O) conducted a Phase II initial environmental site assessment (ESA) at the FDA Beltsville, Maryland, site prior to further development of the site. While G&O was not specifically requested to address items one and two above, the study was designed as an initial environmental assessment to survey the site for potential environmental and radioactive contaminants due to any possible past releases of hazardous materials/hazardous wastes or other contaminants. Based on the results, GSA and FDA would decide if

* The only NRC Radioactive Materials License located at the Beltsville Site where the Environmental Site Assessment was performed has been issued to FDA's Center for Food Safety and Applied Nutrition (CFSAN).

ENCLOSURE A - ENVIRONMENTAL SITE ASSESSMENT ISSUES/NUCLEAR REGULATORY COMMISSION (NRC) LICENSING ISSUES (Continued)

more studies were warranted to evaluate the extent and distribution of any contamination discovered. This phased approach is typical of, and consistent with, the manner by which Phase II ESAs are conducted to meet due diligence standards in a cost-effective manner. The G&O study concluded, "Based on the existing sample analytical results, it is concluded that the radioactive levels observed are all within acceptable levels for naturally occurring radionuclides."

On November 16, 1992, the Food and Drug Administration (FDA)/Center for Food Safety and Applied Nutrition (CFSAN) submitted to the Nuclear Regulatory Commission (NRC) a Decommissioning Funding Plan (DFP), prepared by The KEVRIC Company, Inc., and Letter of Intent to provide financial assurance for the renewal of the NRC License No. 08-00482-03 (Docket No. 030-03917). Based on their review of the DFP, the NRC raised questions similar to those raised by the MDE and requested additional information regarding disposal issues in a letter dated November 2, 1993. An FDA contractor addressed these questions and, based on its work, the FDA is contemplating additional environmental surveys of the areas surrounding the Beltsville site. If further evaluation is warranted, the FDA will provide the NRC and MDE with technical details of this evaluation when program plans are finalized. The FDA contractor's findings and recommendations were forwarded to the NRC as a response to their November 2, 1993 letter on January 13, 1994. Based on an MDE request, this document is attached (Attachment 1 of Enclosure A).

Information dealing with the use and disposal of radioactive materials at the Beltsville site are being further investigated by the FDA to determine if radioactive portions of various studies were conducted at the site in the late 1960's and early 1970's. We will provide the results of this investigation to the NRC and MDE as they become available.

MDE Concern #3:

The contractor (G&O) and their sub-contracted laboratory provided background activity levels and minimum detectable activity for radiation counting equipment used to evaluate water and soil samples for only tritium and naturally occurring radioisotopes. MDE cannot make a judgement on the entire scope of radiation counting based only on calibration data for tritium and naturally occurring radioisotopes.

ENCLOSURE A - ENVIRONMENTAL SITE ASSESSMENT ISSUES/NUCLEAR REGULATORY COMMISSION (NRC) LICENSING ISSUES (Continued)

Response to Concern #3:

The laboratory used to conduct the analyses on the water and soil samples for the presence of radioactive materials, General Engineering Laboratory, meets the criteria of the following independent federal, state and consensus organizations:

- International Association of Environmental Testing Laboratories,
- U.S. Environmental Protection Agency's (EPA) Environmental Monitoring System Laboratory (EMSL) Program,
- Round Robin Quality Assurance Program of the U.S. Department of Energy (DOE), and
- State of South Carolina certification for Radiological Testing.

Such adherence to criteria indicates that appropriate analytical procedures are performed in accordance with industry and government standards established for such analyses.

As indicated in the February 14, 1994, letter from Dr. Naresh Chawla, Chief, FDA Safety Staff, in order to completely resolve this quality assurance issue, it was jointly decided by FDA and MDE that a site visit to the laboratory in South Carolina would be made by Mr. Michael Terpilak and Dr. Chawla of FDA and Mr. Niel Thompson, MDE, sometime after March 14, 1994.

ENCLOSURE A
ATTACHMENT 1

RESPONSES TO
NUCLEAR REGULATORY COMMISSION (NRC)
REQUEST FOR ADDITIONAL INFORMATION

DEPARTMENT OF HEALTH & HUMAN SERVICES



Food and Drug Administration Washington OC 20204 January 13, 1994

United States Nuclear Regulatory Commission Region I 475 Allendale Road King of Prussia, PA 19406-1414

Attn:

Mohammed M. Shanbaky, Chief Research & Development Section Division of Radiation Safety and Safeguards

License No. 08-C0482-03 Docket No. 030-03917 Control No. 116499

Dear Dr. Shanbaky:

This is in reference to your letter dated November 2, 1993 requesting additional information on the Decommissioning Funding Plan (DFP) submitted to your office by the Food and Drug Administration (FDA) Center for Food Safety and Applied Nutrition (CFSAN). I trust this letter and enclosures will be sufficient to expedite the evaluation of our license renewal request.

I would appreciate the transmittal of all correspondence relative to the licensing of these facilities directly to Mrs. Dorie Waddick, Radiation Safety Officer for the Center for Food Safety and Applied Nutrition (CFSAN) Safety Management Branch (SMB).

Please communicate directly with her at the following address:

Dorie Waddick, Radiation Safety Officer U.S. Food and Drug Administration Safety Office, Mail Code HFS-657 Room 6113 200 "C" Street, S.W. Washington, DC 20204

(202) 205-4281

R=95%

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Thank you in advance for your utmost cooperation and attention in this matter.

Sincerely,

Done Waddick Dorie Waddick

Radiation Safety Officer

CC: N. Chawla
D. Thompson
W. Hoffman

M. Terpilak

IMPLEMENTATION PLAN FOR INTERIM LOW-LEVEL WASTE MANAGEMENT U.S. FOOD AND DRUG ADMINISTRATION NRC LICENSED FACILITIES IN MARYLAND

FEBRUARY 1994

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INTRODUCTION

The Food and Drug Administration (FDA) has been charged with the mission to protect the public health of the Nation as it may be impaired by foods, drugs, biological products, cosmetics, medical devices, ionizing and nonionizing radiation-emitting products and substances, poisons, pesticides, and food additives. FDA's regulatory functions are geared to insure that: Foods are safe, pure, and wholesome; drugs, medical devices, and biological products are safe and effective; cosmetics are harmless; all of the above are honestly and informatively packaged; and that exposure to potentially injurious radiation is minimized.

In order to fulfill this mission, the FDA conducts various types of research in the State of Maryland which requires the use of radioactive materials. The FDA currently operates nine facilities under four separate Nuclear Regulatory Commission (NRC) licenses in the State of Maryland. The licenses and facilities covered are identified as follows:

NRC License Number 08-00482-03: Broad Scope Type A License

Radiation Safety Officer: Ms. Doris Waddick Staff Health Physicist: Mr. Michael S. Terpilak, CHP

Food and Drug Administration Center for Food Safety and Applied Nutrition (CFSAN) Module One Facility 8301 Muirkirk Road Laurel, MD 20708 MD ID# N34-005-01 Food and Drug Administration Center for Food Safety and Applied Nutrition (CFSAN) Beltsville Research Facility 8501 Muirkirk Road Laurel, MD 20708 MD ID# N34-005-01

Food and Drug Administration Center for Veterinary Medicine (CVM) Beltsville Agricultural Research Center, East Beltsville, MD 20705 MD ID# N34-004-01

NRC License Number 19-07538-06: Specific License

Radiation Safety Officer: Michael A. Ussery, Ph.D.

Food and Drug Administration Center for Drug Evaluation and Research (CDER) 5516 Nicholson Lane, Suite 300 Kensington, MD 20895 MD ID#: Not yet assigned for this facility

NRC License Number 19-07538-05: Specific License

Radiation Safety Officer: Mr. Raymond W. Klecker

Food and Drug Administration Center for Drug Evaluation and Research (CDER) 4 Research Court Rockville, MD 20850 MD ID# N32-010-010

NRC License Number 19-07538-01: Broad Scope Type A License

Radiation Safety Officer: Mr. Edward A. Tupin, CHP

Food and Drug Administration Center for Devices and Radiological Health (CDRH) 12720 Twinbrook Parkway Rockville, MD 20857 MD ID# N32-008-01

Food and Drug Administration Center for Devices and Radiological Health (CDRH) 12200 Wilkins Avenue Rockville, MD 20857 MD ID# N32-008-01 Food and Drug Administration Center for Devices and Radiological Health (CDRH) 12709 Twinbrook Parkway Rockville, MD 20857 MD ID# N32-008-01

Food and Drug Administration Center for Devices and Radiological Health (CDRH) 1901 Chapman Avenue Rockville, MD 20857 MD ID# N32-008-01

ORGANIZATION OF PLAN

The Food and Drug Administration's (FDA) interim low-level waste (LLRW) management plan is organized in the following manner:

- Waste Management Program: The FDA has developed a waste management program
 which is general in nature to allow for flexibility and changing availability of off-site
 disposal options.
- II. Decay-In-Storage (DIS) Program: The FDA is currently formalizing, in writing, existing and planned DIS procedures as part of its overall implementation plan.
- III. Waste Minimization Techniques: The FDA is developing new options and precedures for the minimization of generated wastes.
- IV. Interim and Long Term Storage Program: The FDA is in the process of preparing procedures for the interim on-site storage of wastes pending the availability of disposal capacity at the Appalachian Compact disposal site in Pennsylvania.
- V. Mixed Waste Management: The FDA is developing new options and procedures for the disposal of certain mixed waste forms.
- VI. Level of Effort and Personnel Required: The FDA has identified the level of effort and those support personnel needed to implement this plan.

I. WASTE MANAGEMENT PROGRAM

A. PURPOSE

The following is a description of the Low-Level Radioactive Waste (LLRW) Management Procedures designed to correspond to the State of Maryland Implementation Plan for Interim Low-Level Waste Management. It will be used as the FDA model to manage and dispose of LLRW generated in the State of Maryland. It will outline those procedures that will be followed to assure the safe management of LLRW until the Appalachian States Compact disposal site is available to accept such wastes.

B. DESCRIPTION OF LLRW MANAGEMENT PROGRAM

1. Disposable Waste Forms (See Attachments 1A - 1F: Waste Process Flow Diagrams)

The following waste forms will have disposal options available during the transition period (1994 to 1999) and as such will be managed in almost the same fashion as presently performed.

- a. Aqueous Waste: Aqueous liquids will be collected in bulk, assayed to document isotopic content and activities prior to disposal through the sanitary sewer system in accordance with Maryland and NRC rules (COMAR 26.12.01.01 Sec D.303 and 10 CFR Part 20, Section 20.2003). Where discharge to the sanitary sewer system is not permitted (CVM and both CDER locations), the aqueous waste will be packaged to meet Department of Transportation (DOT) requirements (49 CFR Parts 100-177 and 10 CFR Part 71) and will be shipped to a service vendor for off-site disposal.
- b. Liquid Scintillation (LS) Vials and Bulk LS Fluids: These materials will be packaged to meet DOT requirements (49 CFR Parts 100-177 and 10 CFR Part 71) and will be shipped to a service vendor for off-site disposal using a fuel blending process.
- c. Other Mixed Wastes: Environmental Protection Agency (EPA) regulated wastes (F and D series) containing radioactivity will be packaged to meet DOT requirements and shipped off-site for processing and disposal as available to FDA (see Section V. Mixed Waste Management for more details). If off-site disposal is not available, these materials may be stored on-site or at a licensed vendor's storage facility off-site. If stored on-site, FDA understands the need to submit an application for a Controlled Hazardous Substance facility permit for the applicable FDA facilities. Decay-In-Storage (DIS) procedures may also be an option. The intent is to ship off-site disposable mixed waste for processing and destruction. It is the intent of the FDA to establish policies and procedures prohibiting the generation of non-disposable mixed wastes.
- Non-Disposable Waste Forms which can be Processed into a Disposable Form (See Attachments 1A - 1F: Waste Process Flow Diagrams)
 - a. Aqueous Liquid in Vials, < 50 ml (e.g. Original Source Vials): These vials will have

their contents emptied into liquid wastes. The empty vials will be processed through decay-in-storage and/or waste minimization techniques for disposal as ordinary trash. Empty vials that cannot be discarded as ordinary trash will be added to the appropriate dry solid waste stream.

- b. Absorbed Aqueous Liquids: This waste form is best managed by avoiding its generation. If it is produced, it will be processed by decay-in-storage or volume reduced using waste minimization techniques for disposal as ordinary trash. Those absorbed aqueous liquids that cannot be discarded as ordinary trash will be added to the appropriate dry solid waste stream.
- c. Dry Solid Wastes: Dry solid wastes meeting certain criteria may be processed into a non-radioactive disposable form through the use of decay-in-storage and/or waste minimization techniques for disposal as ordinary trash.
- 3. Non-Disposable Waste Forms (See Attachments 1A 1F: Waste Process Flow Diagrams)
 - a. Dry Solid Wastes: Dry solid wastes will be managed using decay-in-storage and waste minimization techniques followed by volume reduction (VR). These techniques will involve the following:
 - 1. Separation of isotope groups at the user level.
 - Decay-in-storage for short half-life isotope materials.
 - Waste minimization efforts to separate and identify contaminated from noncontaminated components.
 - On-site compaction at the Module One (MOD 1) and Beltsville Research Facility (BRF) locations only. On-site compaction at the 12709 Twinbrook Parkway facility (CDRH) is also being explored.
 - Off-site volume reduction via compaction and return for storage, if available. Appropriate amendments to each NRC license will be made, as necessary. CDRH has included this option in its November 28, 1993, license renewal application to the NRC.
 - 6. Incinerable waste forms may be shipped off-site for volume reduction via incineration and either disposed of at a licensed disposal facility or returned for on-site storage until disposal capacity is available. Appropriate amendments to each NRC license will be made, as necessary. CDRH has included this option in its November 28, 1993, license renewal application to the NRC.
 - On-site storage. (See Section IV. Interim and Long Term Storage Program for more details.)
 - 8. Off-site storage, if available. (See Section IV. Interim and Long Term Storage Program for more details.)

- b. Animal Carcasses/Biological Materials:
 - 1. Separation of isotope groups at the user level.
 - Decay-in-storage for short half-life isotope materials.
 - Waste minimization efforts to separate and identify contaminated from noncontaminated components.
 - 4. Specific waste as defined by NRC regulations (10 CFR Part 20, Section 20.2005) at the BRF, MOD1 and CVM locations will be incinerated on-site at BRF and CVM. A Maryland certified incinerator operator will perform all burns of specific waste. All records of incineration required by the NRC and Maryland Department of the Environment (MDE) shall be maintained.
 - 5. On-site storage of specific waste awaiting incineration.
 - 6. Incinerable waste forms may be shipped off-site for volume reduction via incineration and the stabilized ash (dry solid waste) will be returned for storage until disposal capacity is available at the Appalachian States Compact site. Appropriate amendments to each NRC license will be made, as necessary.

II. DECAY-IN-STORAGE (DIS) PROGRAM

A. PURPOSE

The FDA has multiple facilities generating, and/or proposing future generation of, dry solid, aqueous and animal carcasses/biological wastes which are contaminated with short half-life isotope materials. In order to reduce disposal costs, to deal with the diminishing availability of prudent disposal options for dry solid waste, and to actively pursue waste minimization techniques, the FDA is (and/or plans to) utilizing decay-in-storage (DIS) practices for its dry solid, aqueous and animal carcasses/biological wastes. The FDA is in the process of developing/modifying written procedures for its current DIS practices under each applicable NRC license. It is anticipated that the DIS program may differ from one facility to the next due to NRC license conditions and all applicable site specific procedures will be determined with respect to local regulatory constraints and facility provisions. The written programs will contain technical methods/procedures to ensure the licensee remains within regulatory guidelines and will keep with the constraints of the NRC's As Low As Reasonably Achievable (ALARA) requirements. Such methods/procedures will address issues such as appropriate administrative controls, collection, review, packaging, storage, disposal, quality control, inspections, protection of personnel, recordkeeping and contingencies. The FDA will provide MDE copies of these DIS Program documents as they are completed.

III. WASTE MINIMIZATION TECHNIQUES

Identified below are the model waste minimization technique elements (A - F) that are to be used by each of the four FDA NRC licensees to form the basis for their license specific waste minimization programs. Taken together, these six categories constitute the various options for establishing a waste minimization program for any type of radioactive materials user. Implementation of the techniques in each category will vary for specific radioactive materials users, depending upon the physical and chemical processes used, the waste streams generated, and the manner in which the user is organized and managed. The six categories, in the order of discussion in the following subsections are: Personnel, Materials, Processes, Monitoring and Equipment Maintenance, Contamination Control, and Waste Handling.

A. PERSONNEL

Active participation of all personnel involved in the use of radioactive materials, radiation protection, waste management, and regulatory compliance is essential to the success of any waste minimization program. The elements of personnel programs that can contribute to waste minimization are: 1) waste minimization training programs, 2) dedicated waste minimization personnel, and 3) limitation of personnel in radiological control areas.

A <u>waste minimization training program</u> shall be provided to make all employees aware of the importance of integrating waste minimization throughout their work practices. This will include waste minimization training specific to a process for all employees involved in that process, including management. Such training will be supported by all levels of management and employees shall be required to participate at all employment levels.

Dedicated waste minimization personnel (FDA and/or contractor personnel) will be identified to ensure continued implementation and elicit changes in the system. This will be clearly defined as an enforceable policy, with the support of all levels of upper management.

To reduce LLRW generation and worker exposure, radioactive materials users will enforce a policy of <u>limited personnel in restricted areas (RAs)</u>. RAs, as defined by the NRC, are areas to which access is limited by the licensee for the purpose of protecting individuals against undue risks from exposure to radiation and radioactive materials. Work in each RA will be restricted to essential activities, with strict maintenance schedules with controlled access. In relation to the ALARA concept, this will help minimize unnecessary radiation exposure to employees. In the waste minimization context, it will also help prevent unnecessary contamination and subsequent generation of waste during cleanup.

B. MATERIALS

Optimum use of radioactive materials is fundamental to all waste minimization programs. The basic elements of material control that contribute to waste minimization are 1) waste minimization requirements for purchases and contracts, 2) material substitution, including isotope substitution, and 3) material restriction in RAs.

Each radioactive materials user will work together with technical, management, procurement, purchasing and administrative personnel in an effort to achieve the ultimate goal of minimizing the quantities of unused radioactive materials that may eventually have to be discarded as waste.

Material substitution, the replacement of an existing material with another material or process that serves an equivalent function and results in the generation of less waste volume, can be in the form of process feedstocks or equipment. Wherever possible, durable, reusable equipment will be substituted for disposable materials. Radionuclide substitution, a form of material substitution that involves the replacement of a long-lived radionuclide with a shorter-lived radionuclide or with a nonradioactive material, will be done whenever possible.

Material restriction in RAs reduces the inadvertent radioactive contamination of equipment and materials. Materials and personnel permitted in the RA will be limited to those essential to, and within the scope of, the work process.

C. PROCESSES

Process control is the heart of waste minimization. The elements of process evaluation and control are 1) LLRW generator identification, 2) process characterization, 3) process modification, 4) process controls, and 5) cost/benefit analysis. Each FDA NRC licensee will evaluate these elements as they prepare license specifc waste minimization programs.

D. MONITORING AND EQUIPMENT MAINTENANCE

A monitoring and equipment maintenance activity that can become part of a formal waste minimization program is equipment calibration and maintenance programs, including both preventive and required maintenance. Each FDA NRC licensee will evaluate this activity as they prepare license specifc waste minimization programs.

E. CONTAMINATION CONTROL

Efforts to minimize the need for equipment and facility decontamination can result in significant reductions in the total amount of waste produced. Each FDA NRC licensee will address contamination control, as necessary, as they prepare license specific waste minimization programs.

F. WASTE HANDLING

Proper waste handling will reduce waste volumes for disposal, without involving complex waste treatment. The essential elements of a waste handling program include 1) maximizing waste segregation, 2) optimizing waste container size, shape and weight, and 3) decay-in-storage. Each FDA NRC licensee will evaluate these elements as they prepare license specifc waste minimization programs.

IV. INTERIM AND LONG TERM STORAGE PROGRAM

A. IDENTIFICATION OF WASTE TO BE STORED

- Possession Limits: Amendments to modify the radioactive materials licenses may have to be submitted for certain of the four licenses. Any future amendment made necessary by alterations in scope of work performed, unexpected disposal options, or potential delays in expected options will be submitted at that time.
- 2. Maximum Volumes to be Stored: Both volume and activity of wastes to be kept in an Interim Storage plan are commensurate with the timely availability of disposal options. Should predictions of a 1999 opening of a licensed disposal site in Pennsylvania hold true, FDA's dry solid waste volumes through 1999 are estimated as shown in Table 1 below. These quantities are overestimates and reflect long-lived dry solid waste.

License Number	Location(s)	Waste Type	1993 Cu.Ft.	1994 Cu.Ft.	1995 Cu.Ft.	1996 Cu.Ft.	1997 Cu.Ft.	1998 Cu.Ft.	1999 Cu.Ft.	Total Cu.Ft
08-00482-03	MOD1 & BRF	A	45.0	45.0	60.0	75.0	97.5	97.5	97.5	517.5
08-00482-03	CVM	A	7.5	15.0	22.5	30.0	45.0	45.0	45.0	210.0
19-07538-05	CDER @ Rockville	A	22.5	22.5	22.5	22.5	22.5	22.5	22.5	157.5
19-07538-06	CDER @ Kensington	A	15.0	15.0	15.0	15.0	15.0	15.0	15.0	105.0
19-07538-01	CDRH	A	15.0	15.0	15.0	15.0	15.0	15.0	15.0	105.0
TOTAL AN	IOUNT (CU.F	T.) OF	FDA DE	RY SOL	ID WAS	STE TH	ROUG	H 1999:		1,095

TABLE 1*

See attached Maryland Department of the Environment Annual Low-Level Radioactive Waste Survey forms for each of the four FDA NRC licensees for more details. (Attachments 2A - 2D)

- 3. Characterization of the Stored Wastes:
 - a. All wastes stored will be Class A wastes.

^{*} Implementation of waste minimization programs and volume reduction (compaction) are expected to dramatically reduce these figures.

- b. The physical form will be long-lived dry solid.
- c. Volumetric reduction of solid waste will be achieved by compaction at the MOD1 and BRF facilities. If available, volumetric reduction of solid wastes may be achieved at all licensed sites by incineration or compaction, utilizing licensed re-processors. Appropriate amendments to each NRC license will be made, as necessary.
- d. No additional non-radiological properties have been identified at this time.
- 4. Amounts of Dry Solid Wastes Currently Being Stored: See Table 2 below.

License Number	Location(s)	Waste Type	Dry Solid Waste Currently Being Stored
08-00482-03	MOD1 & BRF	A	~ 45.0 Cu.Ft.
08-00482-03	CVM	A	~ 11.0 Cu.Ft.
19-07538-05	CDER @ Rockville	A	~ 22.5 Cu.Ft.
19-07538-06	CDER @ Kensington	A	~ 15.0 Cu.Ft.
19-07538-01	CDRH	A	~ 17.0 Cu.Ft.
Total DSW C	urrently Bein	~ 90.5 Cu.Ft.	

TABLE 2*

- * Amounts shown do not reflect short-lived dry solid waste being held for decay-in-storage.
- 5. Additional Permits or Approvals Necessary for Storage: No additional permitting is anticipated at this time.

B. PLANS FOR FINAL DISPOSAL

- The State of Pennsylvania is scheduled to open a disposal site for all Appalachian Compact generators in 1999.
- All wastes meeting the Pennsylvania site's acceptance criterion will be shipped at the first available date.

C. PHYSICAL DESCRIPTION OF INTERIM STORAGE AREAS

Center for Veterinary Medicine (CVM)

The interim LLRW storage facility is a detached, single story, masonry block structure approximately 16' x 16'. It is slab-on-grade construction with a raised door threshold to provide spill containment. The walls and floor are sealed with epoxy paint. The building lights, wiring and other electrical components, including a UL listed electric heater, are designed for hazardous locations (Class I, Division I). The building is also equipped with a manually controlled exhaust ventilation system and an ANSUL SPA-50 dry chemical fire suppression system. A freeze-proof emergency shower/eyewash unit is located outside, adjacent to the entry door, and a telephone is in an adjacent storage building. This facility will be used to store LLRW to include dry solid waste, aqueous waste, Liquid Scintillation (LS) vials, LS bulk media, and mixed waste, as necessary until picked up for disposal. It is FDA's opinion that this facility is in conformance with NRC Information Notice 90-09, dated February 5, 1990. However, it has not yet been approved by the NRC. An environmental assessment in accordance with the National Environmental Policy Act (NEPA) will be conducted for this facility and is currently estimated to be completed by March 31, 1994. Current LLRW storage consists of the following:

- Aqueous Liquids 12 gallons
- Mixed Waste 500 ml of 5% solution of Trichloracetic Acid
- Dry Solid Waste 2 Drums
 - 0.001 mCi 3H, 0.386 mCi 14C (Full)
 - 0.001 mCi 3H, 0.001 mCi 14C (Not Full)
- Sealed Sources
 - 10 mCi ³H (1)
 - 15 mCi 63Ni (2)
- LS Vials and Bulk Liquids NONE

Center for Food Safety and Applied Nutrition (CFSAN) - MOD 1 and BRF

The interim LLRW storage facility is an attached, masonry block structure approximately 20' x 20', identified as the Grounds Maintenance Storage Area at MOD 1. It is a slab-on-grade construction with a roll-up door for entry. The area is naturally ventilated and is protected by an automatic sprinkler system. All dry solid waste, aqueous waste, LS vials and LS bulk media from both MOD 1 and BRF are currently being stored in this area, awaiting disposal. This area is currently not in conformance with NRC 90-09. However, the options indicated below are intended to correct this situation. Current LLRW storage consists of the following:

- Aqueous Liquids 7 gallons
- Mixed Waste 1 gallon 20% Methanol & 10% Acetic Acid
- Dry Solid Waste 7 Drums
 - 0.351 mCi 3H, 0.087 mCi 14C (Full)
 - 0.800 mCi 3H, 0.576 mCi 14C (Full)
 - 0.075 mCi 3H, 0.125 mCi 14C (Full)
 - 0.800 mCi 3H, 0.173 mCi 14C (Full)

- 0.005 mCi 14C (Not Full)

- 0.78 mCi 32P, 0.09 mCi 35S, 0.001 mCi 125I (Full - Decay-in-Storage)

- 0.65 mCi 32P, 1.12 mCi 35S (Full - Decay-in-Storage)

- Sealed Source
 - 15 mCi ⁶⁰Ni (1)
- LS Vials 1 Drum
 - 0.001 mCi 3H, 0.001 mCi 14C (Not Full)
- Bulk LS Media 40 Gallons

The interim LLRW storage facility for the mixed waste, known as the Neo-Natal Nursery, is located on the BRF site. It is a detached, masonry block structure approximately 16' x 16'. It is slab-on-grade construction, which is separated by partition into two equal halves with separate entry into each. It is equipped with a mechanical ventilation system. Approximately 10 gallons of mixed waste is currently being stored in DOT approved containers inside of OSHA approved flammable storage cabinets in one half (room) of this facility. The room is equipped with two (2) five pound ABC type fire extinguishers. This area is currently not in conformance with NRC 90-09. However, the options indicated below are intended to correct this situation. Current mixed waste storage consists of the following:

- · Mixed Waste
 - 4 liters of 15% Phenol, 15% Chloroform, 20% Ethanol, 50% Water, 3H, 14C
 - 4 liters of Methanol, Chloroform, 14C
 - 8 liters of 95% Ethanol, 5% Ammonium Formate, 14C
 - 3 liters of 5% Trichloracetic Acid, 95% Water or Buffer, 3H, 14C
 - 50 mL of 95% Ethanol, 5% Caffeine Methyl, 3H
 - 4 liters of 20% Ethanol, 15% Chloroform, 15% Phenol, 50% Water, 3H, 14C
 - 4 liters of 20% Ethanol, 15% Chloroform, 15% Phenol, 1% Sodium Hydroxide (1N), 49% Water, ³H

In order to ensure conformance with NRC 90-09 as well as state and local environmental protection requirements and fire codes, the FDA has tasked an Architect and Engineering (A&E) firm to develop concept and construction drawings and specifications for two different options for LLRW storage facilities to be located on the BRF site.

Option 1: Purchase and install a minimum of three pre-fabricated buildings, approximately 11' x 42' in size. One unit will be for the storage of dry solid waste, a second unit will be for the storage of LS vials/bulk media, mixed waste for 90 days and aqueous waste, and the third unit will house a drum compactor. These units will be in conformance with NRC 90-09 as well as state and local environmental protection requirements and fire codes.

Option 2: Renovations to an existing structure (Kennel #5) which was once used as a kennel for animals (dogs and swine) for storage (two to three wings for dry active waste and one wing for liquid scintillation vials/bulk media, mixed waste for 90 days and aqueous waste) and operation of a drum compactor (central area or one wing of kennel). This structure will be in conformance with NRC 90-09 as well as state and local environmental protection requirements and fire codes.

The FDA is reviewing the concept drawings submitted by the A&E firm on February 18, 1994, for these two options. An environmental assessment in accordance with the National Environmental Policy Act (NEPA) is currently being conducted for each option. Final construction drawings and specifications, construction cost estimates, and final environmental assessment reports are expected by May 1, 1994. Based on the cost estimates provided, the construction schedules, etc., the FDA will make a decision on which option to pursue on or about June 1, 1994. FDA will review the final construction documents and will expeditiously advertise for construction of the chosen option. In addition, a license amendment is estimated to be submitted to the NRC on or about August 1, 1994. NRC approval is estimated to take six to twelve months. Construction start and completion dates cannot be given at this time pending approval by the NRC. Any variations in these estimated milestones will be provided to MDE.

Center for Drug Evaluation and Research (CDER) - 5516 Nicholson Lane

The interim LLRW storage area is a laboratory room (Room 307) approximately 85.5 ft² in size. The room is heated and air conditioned with 100% exhausted air and is protected by an automatic sprinkler system. Current LLRW storage consists of the following:

- Dry Solid Waste 3 Drums
 - 0.002 mCi 3H (1/4 Full)
 - 0.011 mCi 125I (2 1/4 Full Decay-in-Storage)
 - 5.0 mCi 51Cr (1/2 Full Decay-in-Storage)
- LS Vials 1 Drum
 - 0.023 mCi 3H (1/4 Full)
- Aqueous Liquids
 - 1.01 mCi ³H 7 Liters
 - 0.501 mCi 125I 10 Liters (Decay-in-Storage)

All LS vials and aqueous liquids being stored at this site are scheduled for shipment and disposal off-site on March 14, 1994.

The FDA has identified approximately 300 ft² of space on the first floor of the Nicholson Lane building to dedicate as interim LLRW storage for CDER and has tasked an A&E firm to provide construction drawings and specifications in conformance with NRC 90-09 as well as state and local environmental protection requirements and fire codes. The A&E firm has also been tasked to provide an environmental assessment in accordance with the National Environmental Policy Act (NEPA) for this space. Final construction drawings and specifications, construction cost estimates, and final environmental assessment reports are expected by May 1, 1994. FDA will review the final construction documents and will expeditiously advertise for construction. FDA will also submit a license amendment to the NRC, if necessary. Any variations in these estimated milestones will be provided to MDE. Construction start and completion dates cannot be given at this time pending approval by the NRC.

Center for Drug Evaluation and Research (CDER) - 4 Research Court

The interim LLRW storage area is a laboratory room (Room 318) approximately 108 ft² in size. The room is heated and air conditioned with 100% exhausted air and is protected by an automatic sprinkler system. Current LLRW storage consists of the following:

Dry Solid Waste - 3 Drums

-1.55 mCi 3H, 0.1 mCi 14C (3 Full Drums)

• LS Vials - 1 Drum

- 0.02 mCi 3H, 0.05 mCi 14C

Bulk LS Liquids - 27 Gallons

- 0.40 mCi 3H, 0.57 mCi 14C

All LS vials and bulk LS liquids being stored at this site are scheduled for shipment and disposal off-site on March 14, 1994.

The FDA tasked an A&E firm to provide construction drawings and specifications to transform this space into an interim LLRW storage area in compliance with NRC 90-09 as well as state and local environmental protection requirements and fire codes. The A&E firm has also been tasked to provide and environmental assessment in accordance with the National Environmental Policy Act (NEPA) for this space. Final construction drawings and specifications, construction cost estimates, and final environmental assessment reports are expected from the A&E firm by May 1, 1994. FDA will review the final construction documents and will expeditiously advertise for construction. FDA will also submit a license amendment to the NRC, if necessary. Any variations in these estimated milestones will be provided to MDE. Construction start and completion dates cannot be given at this time pending approval by the NRC.

The FDA is currently evaluating moving this laboratory and by 1995, it is anticipated that the activities, including the LLRW, may be moved to a new location. CDER/FDA will take all necessary NRC licensing actions required to accomplish this move. FDA will provide MDE with all revisions to this plan relating to such a move, as required.

Center for Devices and Radiological Health (CDRH) - All Locations

Approximately 40 ft² of floor space surrounded by a cage/fence on the loading dock at 12709 Twinbrook Parkway is currently dedicated to the long term and short term (decay-in-storage) storage of drums of dry solid waste. This loading dock is located inside of an enclosed, ventilated, secured garage. Two locked flammable storage cabinets, one nominal capacity 60 gallons and the other nominal capacity 80 gallons, are also kept on the loading dock outside of the caged/fenced area for the storage of LS vials and aqueous liquids. More floor space will be dedicated as waste accumulation dictates. A sink is being reserved for exclusive use for disposal of aqueous liquid waste. Disposal will begin when arrangements for adequate analysis of the liquid have been completed and the liquid analyzed to insure it meets all requirements for discharge to the sanitary sewer. Disposal will be made by the RSO or his designee. Current LLRW storage consists of the following:

- Dry Solid Waste 8 Drums
 - 0.2 mCi ³H (2 Full Drums)
 - 0.5 mCi 35S (2 Full Drums Decay-in-Storage)
 - 0.4 mCi 32P (2 Full and 1 Partial Drum Decay-in-Storage)
 - C.06 mCi 45Ca (1 Partial Drum)
- LS Vials 1700 Vials
 - 0.002 mCi 3H (300 Vials)
 - 0.01 mCi 32P (500 Vials)
 - 0.1 mCi 35S (900 Vials)
- · Aqueous Liquids 75 Gallons
 - 50 mCi 35S (34 Gallons Decay-in-Storage and Awaiting Sewer Disposal)
 - 30 mCi 32P (30 Gallons Decay-in-Storage and Awaiting Sewer Disposal)
 - 0.8 mCi 3H (10 Gallons Awaiting Sewer Disposal)
 - 1 mCi 45Ca (1 Gallon Awaiting Sewer Disposal)

D. LONG TERM STORAGE PLANS

1. Long Term Storage Facility (On-Site)

The FDA, through the General Services Administration (GSA), has had an A&E firm working on construction drawings and specifications as well as an environmental assessment in accordance with the National Environmental Policy Act (NEPA) for a long term LLRW storage facility to be constructed on the FDA's Beltsville Research Complex site. This facility is being designed for conformance with NRC 90-09 and applicable state and local environmental protection regulations and fire codes. The construction documents have been reviewed by the FDA at the 95% stage and we are awaiting final/100% documents. The FDA and GSA had anticipated beginning construction of this facility as a component of the FDA Consolidation Plan in October 1993. However, this project has been delayed because the Office of Management and Budget (OMB) is currently reviewing the financial implications of all proposed Federal construction projects. Once FDA has addressed its interim storage needs and when final construction documents, including the environmental assessment are completed, an amendment to CFSAN/FDA's NRC license will be developed and submitted to the NRC for approval. The final construction documents will also be shared with the MDE and the P.G. County Government for review.

It is FDA's plan to use this facility only for the long term storage of long-lived isotopic dry solid waste generated at all FDA locations in Maryland (P.G. and Montgomery Counties) and for decay-in-storage for short-lived isotopic dry solid waste generated at the BRF and MOD 1 locations. All dry solid waste being held for long term storage at each interim storage location would be relocated to this long term storage facility once completed. Appropriate NRC license amendments would be obtained prior to this activity. The long term storage facility will be equipped with a drum compactor for volume reduction purposes and will have sufficient storage space for approximately 600 drums. LS vials, LS bulk liquids, aqueous waste and mixed waste would be stored in the proposed interim storage areas mentioned in Section C. above awaiting pick-up for off-site disposal or, at those authorized facilities, disposal of aqueous liquid waste via the sanitary sewer. Short-lived isotopic dry solid waste generated at locations other than BRF and MOD 1 will be stored on-site in the interim storage areas for decay-in-storage.

Also, please note that the FDA plans to construct, as part of the consolidation project mentioned above, a Module Two (MOD 2) facility on the Beltsville Research Complex site. Again, as mentioned above, the OMB is reviewing the financial implications of this construction project. The CVM activities currently located on the USDA Campus would be relocated to the MOD 2 facility when complete. The LLRW being stored in the CVM interim storage facility would be relocated to the BRF/MOD 1 interim storage facility or the long term facility. CFSAN/FDA will take all necessary NRC licensing actions required to accomplish this move. FDA will provide MDE with all revisions to this plan relating to such a move, as required.

2. Possible Off-Site Long Term Storage Capability

The FDA is presently negotiating an Interagency Agreement (IAG) with the U.S. Army Armament, Munitions and Chemical Command (AAMCC) located at Rock Island, Illinois for disposal and/or storage of LLRW generated by FDA NRC licensed facilities. The FDA's technical and legal personnel are currently reviewing various documents related to this IAG. Pending technical and legal evaluations, an exact date that this agreement will be in place is very difficult to determine at this time. If this IAG is in place far enough in advance of the closure of the Barnwell, SC site on June 30, 1994, to generators outside of the Southeast States Compact, the FDA will attempt to dispose of, at Barnwell, all dry solid waste currently being stored. MDE should be assured that FDA personnel are actively pursuing this option. The FDA feels the above mentioned interim and long term storage plans will be sufficient back-up to this IAG option for managing its LLRW until the Pennsylvania site opens.

E. PACKAGING AND CONTAINER INTEGRITY

- 1. The containers to be used for both interim and long term storage of uncompacted dry solid waste will be new or reconditioned steel drums (DOT type 17H, open head 55 gallon). Each container will be lined with a 4 mil poly liner. No degradation from stored waste(s) is anticipated. Each container should maintain its integrity for 15 years, excepting unforeseen external influences. Criteria for packaging and container integrity for compacted dry solid waste will be determined as FDA gets closer to compaction capabilities and this information will be shared with the MDE and the NRC.
- All packages will be inspected individually on a periodic basis. A visual inspection of
 container integrity will be complemented with a smear sample taken on each container.
 The storage area will undergo monthly inspections which may include random container
 integrity smear samples.
- 3. Given that only solid waste forms are to be stored, no program will be instituted regarding overpacking. Should a container begin to lose integrity, the lined contents will be placed into another 4 mil liner and into another drum. Any believed loss of integrity will prompt an immediate contamination survey of the storage area and an investigation into the causes of this loss of integrity to determine if corrective control measures must be taken. Overpacking for 55 gallon drums that have been supercompacted off-site, will be used if this off-site volume reduction option is exercised.
- LS vials, LS bulk liquids, aqueous liquid wastes, mixed wastes and short-lived isotopic dry solid wastes will be packaged as being done presently in accordance with MDE, NRC and

DOT requirements.

F. RADIATION PROTECTION

- 1. All containers will be surveyed with regard to dose rate at the surface and at one meter. Containers will be arranged in the storage area so as to keep all radiation levels within, and outside of the areas, as low as reasonably achievable (ALARA). Health physics surveys will be performed in accordance with individual license conditions to verify that radiation levels and contamination levels are within license requirements. Additional radiation level surveys will be performed each time materials are deposited or removed from the facility.
- Given the low activity of isotopes, their relative low energies and/or short half-lives now
 in use under the FDA's four licenses, no additional measures outside of the current safety
 programs will be required. Thus, no elevated exposure rates are anticipated.
- 3. In accordance with each FDA component's safety plans, emergencies will be responded to in a prudent manner so as to assure that the actions essential to the resolution of the situation are taken. All storage areas will be clearly labeled so that any emergency response unit will be aware of the hazardous constituents involved. Full cooperation will be offered to an emergency unit needing specific information about any hazardous materials used at FDA's facilities.
- 4. Waste inventories will be kept for all laboratory containers. The inventory for each waste container will be transcribed onto a master waste log at each facility. The master log will show the isotopes and activities for all wastes placed into any specific container, as well as the unique container identification number for each container in storage.

G. TRAINING

 Waste packaging, handling, placement, inspection, and surveying will be conducted by FDA personnel and/or Radiation Support Services contractor(s) personnel.

H. FINANCIAL ASSURANCE

 Certification of financial assurance for decommissioning is required by the NRC for only the CFSAN/FDA and CDRH/FDA licenses. CFSAN submitted its certification to the NRC on November 16, 1992, and CDRH submitted its certification to the NRC on November 28, 1993. Both are awaiting approval by Region I, NRC.

I. EMERGENCY PREPAREDNESS

 This item required by the NRC is not applicable for any of the four FDA NRC licenses since the possession limits referenced in the NRC regulations are not exceeded. However, the FDA licensees will work with state and local authorities, as necessary, to prepare for emergency situations.

V. MIXED WASTE MANAGEMENT

A. BACKGROUND

The FDA generates a limited amount of "mixed" wastes, which require special handling and disposal procedures. Mixed wastes are defined as those which contain licensed amounts of radioactivity along with a chemical form which qualifies it as a controlled hazardous substance under MDE regulations or as a hazardous waste under the Resource Conservation and Recovery Act (RCRA). Under current MDE rules, these materials require shipment for disposal within 90 days unless the facility is permitted as a treatment, storage and disposal (TSD) facility.

B. DISPOSAL OPTIONS

Off-Site disposal facilities for mixed waste are very limited. Those available for accepting FDA wastes are the following:

- Quadrex Environmental Company (Gainesville, FL): QEC is available and is licensed to accept LS counting vials and bulk LS media. These are the only mixed waste forms that QEC is currently permitted to accept.
- Diversified Scientific Services, Inc. (Oak Ridge, TN): DSSI is permitted to accept flammable and combustible mixed wastes. They re-started operations in December 1993, and thereafter, have been reducing their current inventory prior to accepting additional volume. They will begin accepting additional volume in March 1994. The FDA is currently negotiating a near term Interagency Agreement (IAG) with the AAMCC, mentioned in Section D.2. of the INTERIM AND LONG TERM STORAGE PLANS portion of this document, to dispose of approximately ten (10) gallons of existing mixed waste.

C. FDA POLICY ON MIXED WASTE GENERATION

- Since there is an available and currently used disposal option for LS vials and bulk LS media, FDA will continue to generate such wastes.
- The FDA is arranging for the disposal of mixed wastes other than LS vials and bulk LS liquids at DSSI.
- It is the intent of the FDA to establish policies and procedures prohibiting the generation of non-disposable mixed wastes.

VI. LEVEL OF EFFORT AND SUPPORT PERSONNEL

The types of labor identified for the FDA's LLRW Management Plan are listed below:

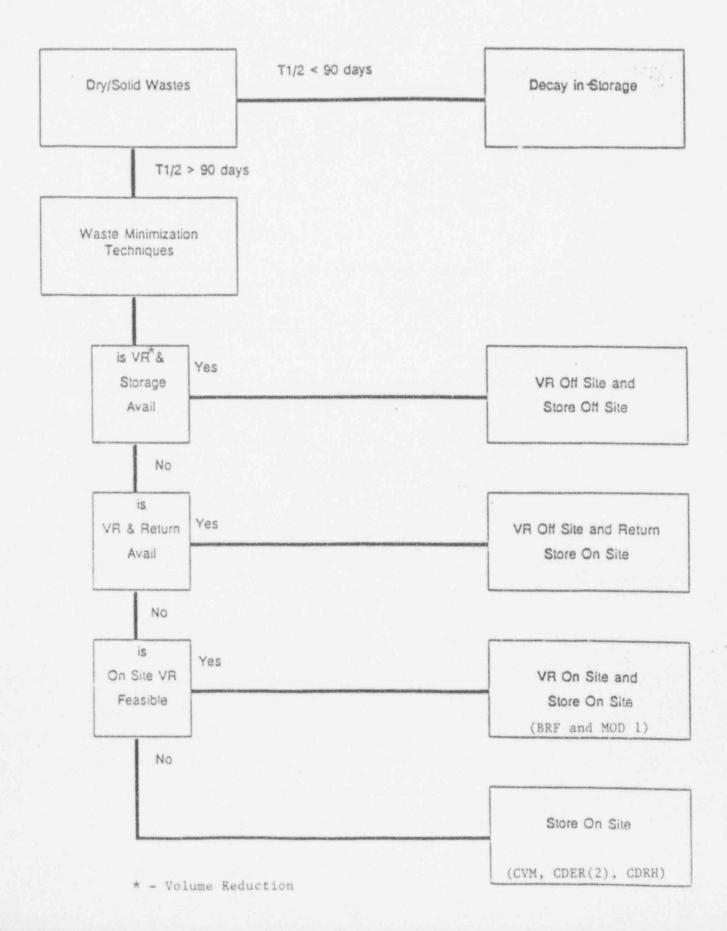
- A. Radiation Safety Officer(s) (RSO): These four individuals are FDA employees listed on the four NRC licenses and are responsible for the administration of licensed activities, including LLRW management, in accordance with NRC requirements, license conditions, and other applicable federal, state, and local requirements.
- B. Senior Radioactive Waste Technician (SRWT): These individuals will be contractor personnel who have training and experience necessary to allow them to make decisions about waste acceptance, suitability for each program, and characterization criteria, in addition to providing supervision of other waste technicians.
- C. Radioactive Waste Technician (RWT): These individuals will be contractor personnel who perform waste handling functions under the supervision of the RSO and the SRWT.
- D. Senior Health Physics Technician (SHPT): These individuals will be contractor personnel who may be used to manage the FDA waste program and provide an additional source of technical labor and expertise to the FDA staff. Anticipated additional duties may include program administration, maintenance of records, responses to user requirements and assistance requests, and other duties as may be required by the FDA.
- E. Health Physics Technician (HPT): These individuals will be contractor personnel who have special training in performing health physics functions in support of the waste handling, packaging, sorting and other waste management functions. These special functions include air sampling for workplace and environmental compliance, contamination surveys of work areas during and after work activities, surveys of equipment for unrestricted release after operations, QA inspections of work activities, dosimetry functions, and others.
- F. Health Physicist (HP): These individuals will be both FDA and contractor personnel who are required to provide technical oversight to the program, and to prepare technical reports. This expertise will be necessary to prepare accurate reports meeting the license conditions as well as the NRC and MDE requirements. HPs will also provide a tracking system for the FDA wastes.
- G. Administrative/Clerical (ADM): These individuals may be FDA and/or contractor personnel who will provide support for the administrative burdens of a LLRW management plan.

Note that the basic unit for waste management functions will be the Radioactive Waste Team which is comprised of, at a minimum, a RWT, a SRWT, and a HPT. Such a team is staffed to provide both labor, expertise, and health and safety capabilities so that it can operate independently to perform routine and difficult waste pick-up and processing tasks. The RSOs and HPs will participate as necessary. Such a team may not be necessary for each of the four FDA NRC licenses.

ENCLOSURE B ATTACHMENTS 1A - 1F

WASTE PROCESS FLOW DIAGRAMS

FOR DRY / SOLID WASTES

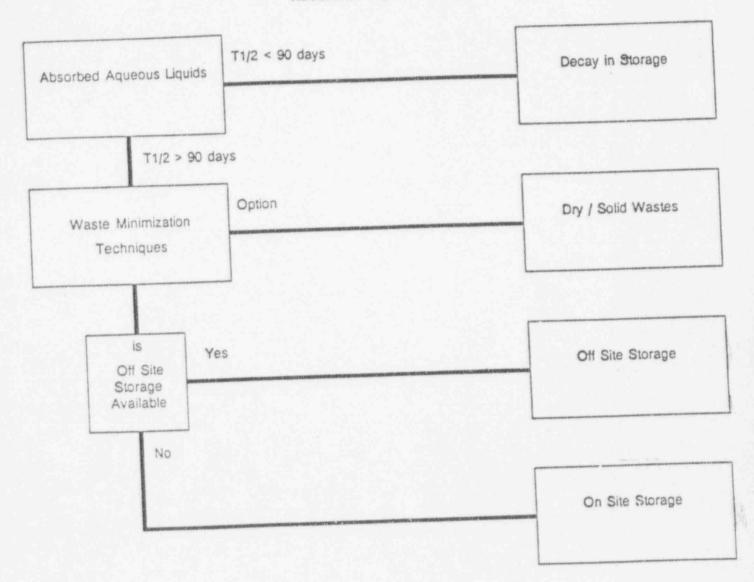


WASTE PROCESS FLOW DIAGRAM FOR OTHER WASTE FORMS

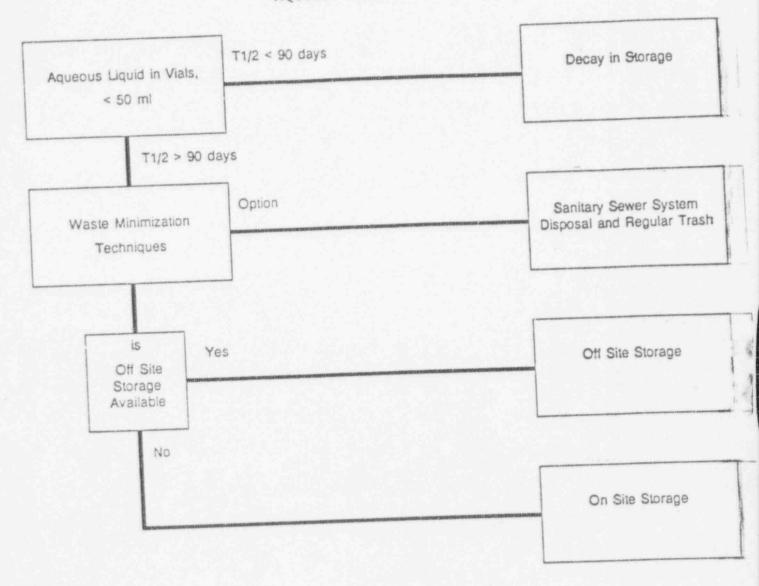
LS Vials, Bulk LS Fluids & Misc. Mixed Wastes

Off Site Incineration

WASTE PROCESS FLOW DIAGRAM FOR ABSORBED AQUEOUS LIQUIDS

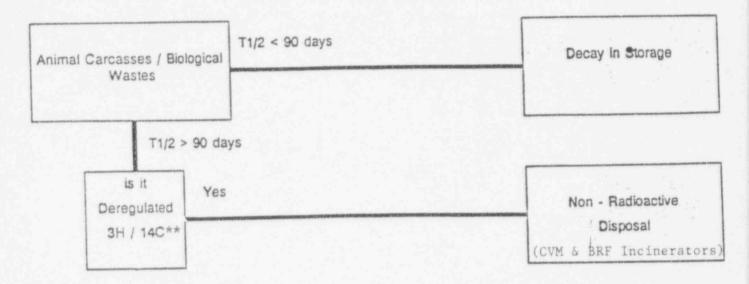


FOR AQUEOUS LIQUID IN VIALS, < 50 ml



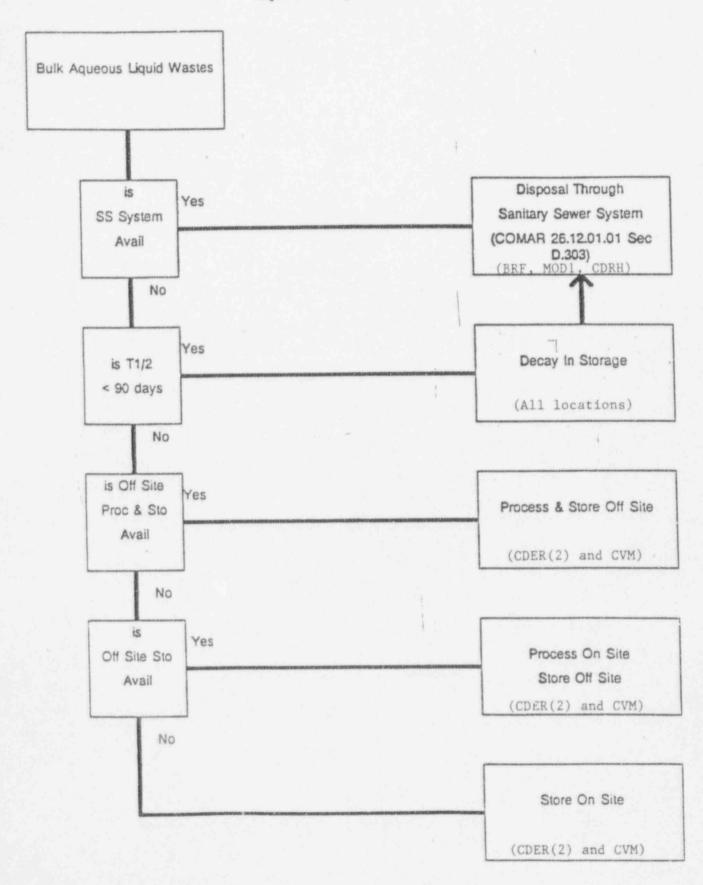
WASTE PROCESS FLOW DIAGRAM FOR

ANIMAL CARCASSES / BIOLOGICAL WASTES



^{**} Regulated 3H and 14C animal carcasses/biological wastes will not be generated.

WASTE PROCESS FLOW DIAGRAM FOR AQUEOUS LIQUID WASTES



ENCLOSURE B ATTACHMENTS 2A - 2D

MARYLAND DEPARTMENT OF THE ENVIRONMENT ANNUAL LOW-LEVEL RADIOACTIVE WASTE SURVEY FORMS

MARYLAND DEPARTMENT OF THE ENVIRONMENT

ANNUAL LOW-LEVEL RADIOACTIVE WASTE SURVEY -

The Maryland Department of the Environment (MDE) Bazardous and Solid Waste Management (MSWMA) needs your assistance to meet a federally mandated milestone under the 1985 Amendments Act. Read this questionnaire carefully and fill in the information requested. Attach additional information, if necessary.

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Waste inventory

4. Estimate volume of Low-Level Radioactive Watta (LLRW), NRC Regulated and NARM, that you expect to have in storage on-site as of January 1 1993. This should be the amount of LLRW that could not be shipped for disposal as of December 31, 1992. Refer to 10 CFR Pert 61 • 55 for the definitions of Class A, B, C or greater than Class C wattes.

Also, estimate the volume of Mixed Watte that you expect to have in storage as of January 1, 1993. Mixed waste refers to that radioactive watte which also contains hazardous waste subject to federal Resource Conservation and Recovery Act, and defined under 10 CFR Part 61 and 40 CFR Part 261.

Waste Dass	CassA	Class B	Class C	Greater Than	Mixed Waste	Total Volume
Volume in Cubic Feet	45.0 F	3 _	5000		n 7 gallar	45.0FF)

Gross Watte Volumes

5. a.) Estimate the volumes of Low-Level Radioactive Waste that you expect to generate using current practices.

Waste	1993 Cu. ft.	1994 Cu. Ft.	1995 Cu. FL	Total Cubic Fee
Class A	45.0	45.0	60.0	150.0
Cau 8	300	-	STATE OF THE PARTY	Opposite State Contract and other party and annual reason
Cass C	gitters of the same of the sam	-	5800	AND THE REAL PROPERTY AND ADDRESS OF THE PERSON ADDRESS OF THE
Greater Than Class C		-	-	· Nace
Possi	45.0	45.0	60.0	150.0

Watte	1996 Cu. PL	1997 Cu. FL	1998 Cu. Fe	Total Cubic Feet
Class A	75.0	97.5	97.5	270.0
Cass 8	MATERIAL SERVICE SERVI	Sales .	260	AND CONTRACTOR OF THE PARTY OF
Class C	AND THE PERSON NAMED IN COLUMN TWO IS NOT THE OWNER.	age to be	- AC	650h
Greater Than Class C	AND A SECOND CONTRACTOR OF THE SECOND CONTRACT	-	-	AND THE PROPERTY AND TH
Total	75	197.5	197.5	270.0

Watte	19 99 Gu. Pt.	Total Cubic Feet
Cass A	97.5	97.5
Class 8	COLUMN *	
Cass C	450°	Manual Control of Cont
Greater Than Class C	-	9000
Total	926	1 97.5

b.) Esumate the volumes of Mixed Waste that you expect to generate using current practices.

	1993 Cu. Pt.	1994 Cu. Pt.	1995 Qu. Ft.	Total Cubic Feet	
Mixed Waste	- System		Acceptance of the second secon	/	
aprophia opionis egypanisti televisios arcinos	1996 Gu. Pt.	1997 Gu. Pt.	1998 QJ. FE	Total Cubic Feet	
Mixed Waste	4200		Application of the control of the co	\$50 ⁸⁹	
	1999			Total Cubic Fee	
er gestelle ikk Thanserson.	1979 Gu. Ft.			- Annual profession and the contract of	

Yalume Reduction

5.	a.)	indicated in #5(a) and (b) above (1993 through 1998). Also indicate percent of volume reduction you expect to achieve.							
		Compaction	0	94	Decontamination	0	%		
		Incineration	0	94	Total Volume Reduction	U	96		
	b.)	If you do not use as install any volume #5(a) and (b)? Wh	reduction	systems in 1	duction methods now, do you the future at your facility for y and to install?	u intend to u westes indica	se of stad in		
		Yes-	one years employ to the	DAG	M COMPACTO	Recognization and the second	un sa sanga di datah sangan da		
	c.)	What is your sched	ula to obt	ain those Di	se amendments you will requi ermits or license amendments				
		NRC Lie	loral	Some	redment -	AURUS	T-1995		
tostr	d.)	By utilizing on-site reduction have you	waste rec	duction/min	imization mothode, how muc	h wacto volu	IME		
7.	a.)	indicate any Off-51 indicated in #5(a) that you expect to	and (b) (1)	e Reduction 993 through	services that you will utilize to 1998). Also indicate parcent	to reduce the tof volume r	eduction		
		Super Compaction	0	%	Incineration	0			
		Decontamination			Total Volume Reduction	0	96		
	b.)	Indicate any additi	onal perm	nits or licen	se amendments you will require to obtain those permits or l	1.00 m 1.10mm m1.1			
ZHIN	c)		Varra Rech		tor ship the volume of reduces				
		If not, what will hi	appen to t	that waste?	NA		A CONTRACTOR OF THE PARTY OF TH		
mass	d.)	amisved so far?	0_4		vices, how much weste volum				
	4.)	What are your cor available to you?			d Off-Site Volume Reduction		: be		
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Net Waste Volumes

8. Subtract volumes expected to be reduced by utilizing #6(a) and/or #7(a), from #5(a) and (b).
After subtraction, add wests inventory volumes from #4 to the remainders to indicate net or real volumes.

	. NET V	- Total Cubic Feet			
Weste Type	1993	1994	1995	, , , , , , , , , , , , , , , , , , , ,	
Cass A	45.0	45.0	60.0	150.0	
Cass 8	9986	Shine 4	gazafi.	1000	
Class C	esti	165	1945.	BECTON CONTRACTOR OF THE STATE OF CONTRACTOR OF STATE OF STATE OF CONTRACTOR OF STATE O	
Greater Then Class C	4000	NgSA	GAN-	NAMES AND ADDRESS OF THE PARTY	
Mixed Waste	41.0	Santa	4600	1 \$.0	
Total	46.0	45.0	60.0	158.0	

Weste Type	. HET V	Total Cubic Fee		
	1996	1997	1998	
CassA	\$5.0	99.5	97.5	270.0
Caul	eng.	-	900	4460
Canc			\$40)	6000
Greater Than Cass C		-		48
Mixed Waste	CEP CONTRACTOR CONTRAC	400	Cap Cap	-
Total	95.0	97.5	197.5	1270.0

	. NET VOLUMES IN CUB	IC FEET Total Cubic Feet
Waste Type	1999	
CassA	97.5	97.5
Class 8	100	, and
Canc	1500 P. C.	AND
Greater Than Class C		
Mixed Waste	NAMES OF THE PARTY	
Total	97.5	1 97.5

9.	a.)	Will you store weste indicated in #8 On-Site until December 31, 1999? Ye S
	b.)	If not then what contingency plans do you have for that weste?
	Pu	PRSVINE OFF-SITE STORAGE with Dept. of the
	,	- truny
10.	a.)	Indicate On-Site Storage Capacity you will have by January 1, 1993, for total waste volume indicated in #8. Total Capacity
	b.1	Indicate any additional permits or license amendments you will require for Qn-Site Storage of watte until December 31, 1992.
	/	A thouty to exceed NRC rummend 5 year
and a	د)	What is your schedule to obtain those pargents or license amendments? include License Renewal 19
expense	-	License Ameridment Uneval during
986538	a de la constanta de la consta	1998 - Au thority to exceed 5 year hold will,
Afr		be require ted in 1997, when the length of completing this survey, sign and date the front cage. Then mail it back to: the systemisms
		Herzardous & Solid Waste Management Admin. Maryland Department of the Environment 2500 Broening Highway Baltimore, Maryland 21224 Anchicket,
		Atterricion: Niel Thompson

MARYLAND DEPARTMENT OF THE ENVIRONMENT

ANNUAL LOW-LEVEL RADIOACTIVE WASTE SURVEY -

The Maryland Department of the Environment (MDE) Bezardous and Solid Waste Management (HSWMA) needs your assistance to meet a federally mandated milestone under the 1985 Amendments Act. Read this questionnaire carefully and fill in the information requested. Attach additional information, if necessary.

scillt)	Na:		Balteville Area	ricultu	Ra	1	Vetelingers Cint
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					E 1	4	GOVERNMENT
A.	()	NUCLEAR POWER PLANT		-	. ;	Federal
2	4	1	OTHER NUCLEAR FUEL CYCLE		- 1	()	State
	,						INDUSTRIAL
C	()	MEDICAL (NON-GOVERNMENT)		F.	,	Research & Davelopment
	()	Hospi Cal			1	Manufacturing
	5	3	Research			()	Decon. Facility & Waste
		1	Medical College or Hospital				Reduction
	-	1	Magical contake or			()	Sealed Sources/Gauges/
0.	- ()	ACADEMIC	19.			Devices
	()	Research				
)	Education				

Valume Reduction

6.	a.)	indicated in #5(a) and (b) above (1993 through 1994). Also indicate percent of volume reduction you expect to achieve.								
		Compaction	0	0 %		Decontamination			14	
		incineration	0	%	Total	Volume Reduct	ion C	94		
	b.)	If you do not use any <u>On-Site Volume Reduction</u> methods now, do you intend to use or install any volume reduction systems in the future at your facility for westes indicated in #5(a) and (b)? What systems do you intend to install?								
**************		No	er c	UM		None	At the	is ti	244	
	c.)	indicate any additi What is your sched	onal perm	its or licer	nse am endr permits or !	nents you will ricense amenda	equire for 6(a) and (b	2).	
dentar	Shift manuscrape		1) A	and a residence of the second	TO COMPANY THE WAS ARRESTED FOR THE PARTY OF			and the same of th	
	d.)	By utilizing on-site reduction have you	uachieved	so far?	materia 99					
7.	a.)	Indicate any Off-Site Valume Reduction services that you will utilize to reduce the valumes indicated in #5(a) and (b) (1993 through 1995). Also indicate percent of volume reduction that you expect to achieve.								
		Super Compaction	_0	94	Incine	PETION		96		
		Oscontamination		······································	Total	Volume Reduct	ion 0	%		
	b.)	Indicate any additi	Whatisv	aur sched	ule to cota	tu mase Setuir	9 PH HYRHIPSE B	(1.00) (PE) 115.00	111001	
		NKC.	Lice	and the	an	rinda	and	AURU	157,199.	
	c)	Will the Off-Site V	Vesto Redu	Ction Ver	dar ship th	e volume of rec	luced waste	back to y	rou for	
		If not, what will h	appen to ti	net waste	?	NA	eligical secretary physics control control			
repai	d.)	By utilizing off-sit actioned so far?	Question 46						you .	
	e.)	What are your cor available to you?	tingency ;				netrod	not be		
		ON	s: +-		TOR	76-6			Carried Million Control of the Control	

Waste Inventory

4. Estimate volume of Low-Level Radioactive Wasta (LLRW), NRC Regulated and NARM, that you expect to have in storage on-lite as of January 1 1993. This should be the amount of LLRW that could not be shipped for disposal as of December 31, 1992. Refer to 10 CFR Part 61 • 55 for the definitions of Class A. B. C or greater than Class C wastas.

Also, estimate the volume of Mixed Wasta that you expect to have in storage as of January 1, 1993. Mixed wasta refers to that radioactive wasta which also contains hazardous wasta subject to federal Resource Conservation and Recovery Act, and defined under 10 CFR Part 61 and 40 CFR Part 261.

Waste Class	CassA	Cass 8	Class C	Greater Than Class C	Mixed	Total Volume
Volume in Cubic Feet	9.5	198		Acapted	500ml	7.5 /

Grass Wasta Volumes

5. 2.) Estimate the volumes of Low-Level Radioactive Waste that you expect to generate using current practices.

Weste	1993 Cu. FL	1994 Cu. Ft.	1995 Cu. Ft.	Total Cubic Fee
Class A	7.5	15.0	22.5	45.0
Class 8	SORP 4	995	***************************************	STATE OF THE PROPERTY OF THE P
Class C	COSD .	850	4,000	William Control of the Control of th
Greater Than Class C	400	-	-	****
Total	7.5	15.0	22.5	45.0

Watte	1996 QJ. PL	1997 Cu. FL	1998	Total Cubic Fee
Class A	30.0	45.0	45.0	120.0
Class B	MESS.	-	4000	matrix
Class C	90531		400	100
Greater Than Class C	59500 April 1	-	-	QARE
Potal	30.0	45.0	45.0	120.0

Waste Class	1999 Cu. PL	Total Cubic Fee
Class A	45.0	45.0
Class 8	tion "	920
Cass C	413b	#55
Greater Than Class C	-	
Total	45.0	45.0

b.) Esumate the volumes of Mixed Waste that you expect to generate using current practices.

Mixed Waste	500ml	5025	5885	Sommel
	MARKET THE RESERVE OF THE PROPERTY OF THE PROP	THE REAL PROPERTY AND ADDRESS OF THE PERSON	Tables of the state of the stat	200000
	1996 Cu. Fe.	1997 Cu. PL	1998 QJ. FL.	Total Cubic Feet
Mixed Waste	TOTAL STREET,		1850	4000

Net Waste Volumes

8. Subtract volumes expected to be reduced by utilizing #6(a) and/or #7(a), from #5(a) and (b).
After subtraction, add waste inventory volumes from #4 to the remainders to indicate net or real volumes.

Waste Type	. NET VO	Total Cubic Feet		
	1993	1994	1995	100010000000
CassA	7.5.	15.0	22.5	45.0
Class 8	1990	elizani ,	WHIG	All parties and the second sec
Cass	4000	1000	Oppose Control	Proposition of the Control of the Co
Greater Than Class C	toses a	-	90000	No.
Mixed Waste	500mg	gddin	10000	
Total	7.5 p sound	15.0	22.5	1 45.0

	. NET	Total Cubic Feet		
Weste Type	1996	1997	1998	1000
CassA	30.0	45.0	45.0	120.0
Cass 8	Miles	seedin .	**************************************	-
Cass	ger tallet ander er man fillsteff ander er met er men er met er men er met er met er met er met er met er met Albert	- matter	Allen and a state of the state	
Greater Than Class C	ORDS 2	-	-	945
Mixed Waste	Albania de la constanta de la	4000	40000	1 -
Total	30.0	145.0	1 45.0	1120.0

	. NET VOLUMES IN CUS	C FEET Total Cubic Feet
Waste Type	1999	2500
Cass A	45.0	45.0
Cass 8	4556	4000
Class		
Greater Than Class C	40% 6	1969
Mixed Waste	Applies Applie	1
Total	45.0	1 45.0

. a.	3 Will you store weste indicated in #8 On-Size until December 31, 1999?
5.	If not then what contingency plans do you have for that weste? FDA preserved
	ff-site storage with the U.S. ARMY
0. a	Indicate On-Site Storage Capacity you will have by January 1, 1993, for total waste volume indicated in #8. Total Capacity
	Indicate any additional permits or license amendments you will require for On-Site Storage of water until December 31, 1992 Authority to useed nice recommend
5	year period for folling Econom site my also
6	What is your schedule to obtain those permits or ilcense amendments?
4	(ice and and ment mend during 1998)
	2. It it to the fold will be
After	equested in 1997 when the longth of the extension is associately predicted.
	Hazardous & Solid Waste Management Admin. Manyland Department of the Environment 2500 Broening Highway Baltimore, Manyland 21224

Attention: Niel Thompson

9-09-94 12:40AM F DAVDP/ARL

MARTLAND DEFARTMENT OF THE ENVIRONMENT ANNUAL LOW-LEVEL RADIOACTIVE WASTE SURVEY -

The Maryland Department of the Anvironment (MDE) Bazardows and Solid Maste Management (SSMMA) needs your assistance to meet a federally mandated milestone under the 1965 Amendments Act. Read this questionneity carefully and fill in the information requested. Attach additional information, if necessary.

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. CHI	وحد وإ	ye category	CEGTEES HOIHWY	FIRES YOUR	PAG	TITY:		
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0.	()	ACAGEMIC					Devices	
	1	Research Education						
	, ,	BOHA GERALAN						
2. If s	urstian t	tre above lice	nse(s) residentive w	aste n gene	retes	#110	cessions ether	
thu	enth na	icersee saar	ess addas, chadk th	s four meets mu	TB 671	@ 1985 ¢	TA CANAGE LEICH STORAGE	



Wago towartary

A Estimate volume of Low-Level Redicective Weste (LLRW), NRC Requisted and NARM, that you expect to have in storage on-site as of Lacuatry 1992. This should be the emount of LLRW that could not be shipped for disposal as of December 11, 1992. Refer to 10 CFR Pert 61 - 35 for the definitions of Classa, 8, Cor greater than Class G Wester.

Also, estimate the volume of Missel Watte that you expect to have in storage as of Lacuatry 1993. Mixed waste refers to that radical rive waste which also contains hearning weste success to federal Resources Conservation and Recovery Act, and defined under 10 CFR Part 61 and 40 CFR Part 281.

Waste Cass	Gos A	Cast	CauC	Greener Than Class C	Mined Weste	Yosal Valume
Vetures In Cubic Feet	15.0	D	Ð	Ö	0	15.0

gerral Weste Valures

E. a.) Estimate the volumes of Law-Level Radiosctive Wasta that you expect to generate using correct precises.

Weste	1393 GL PL	1994 QL FL	1995 Cal PL	Tecal Cubic Fee
CLASS A	15.0	15.0	15.0	1 45.0
Class 8	0'	0	0	10
Class C	0	0	0	10
Greater Than	0	0	0	0
Form	150	15.0	15.0	45.0

Wester	1996 QL PL	1997 Qu. PL	OT W	Total Cubic Feet
Cast	15.0	15.0	15.0	1 45.0
Case 8	0	0	10	0
Class 6	O	0	10	0
Gregger Than	0	0	0	0
Saturi	IC O	15.0	1 15.0	15.0



Waete Class	1999 OL PL	Tessi Gubi s Feer
Clack A	15.0	15.0
Gass 8	0.	1 0
Class C	0 1	0
Greeser Then Class C	0	
Possi	15.0	1 15.0

total by 1999 105.0 A3

b.) Seconda the velumes of Mixed Waste that you expect to generate using current practices.

-	1993 Cu. AL	1994 Cu. Ft.	CLA.	Tech Cabic Feet
Mixed Wase	0	0	0	0

	1996 GJ. Pt.	1977 GL PL	H98 GL PL	Total Cubic Feet
Missau	0 '	0	0	0

	1999 Cal Pe			Tetal Cubic Feet
Mined Waste	. 5	D	U	0

Yoluma Reduction

6.	a.)	inglesse <u>Or-Site Valums Beductlor</u> indicased in \$5(5) and (b) sacre (1 reduction you expect to achieve.	on memods that you will utilize to redu (1993 through 1996). Also indicate perc	tent of volumes
		Compaction	X Decontamination	Maria Ma
		Incineration	Tetal Volume Reduction	Statement of the last of the l
	8.)	If you do not use any <u>Cartille Yolur</u> install any volume reduction system #3(s) and (b)? What systems do yo	ume <u>flectual</u> methods row, do you in ans in the future at your faillity for we you intend to install?	tend to use or nee indicated in
gonzati	e)	indicate any additional permits or wheat is your schedule to obtain the	or license amendments you will require t those permits or license amendments?	or 6(a) and (b).
inadiya	4.)	ŝy utilizing enelta wasta reduction reduction have yeu achieved sa far	sermindanization methods, how much w	SCID VOLUME
7.	<u>د</u> ه	indicated in #5(a) and (b) (1983 the that you expect to achieve.	fuction services that you will utilize to m presign 1997). Also indicate decem of	edura reduction
		Super Compection	We inclneration	Property and Company of the Association of the Asso
		Dicamentalism	h Total Valume Reduction	***************************************
	b.)	indiscre any additional parmits or veture reduction. What is your to	er ilcense emeralments you valil require t schedule to obtain those permits or lice	Butilize off-site nse am endmente?
ggeo.	c.)	Will the Off-The Watte Reduction.	C Vendor ship the volume of reduced wi	este back to you for
		If not, when will happen to thes wi		innergensenter is stillin deflessligen artistes passen. A
ette e	d.)	extrapolation for the forestraps	ion services, how much weste volume n	
	63	What are year corrdingency plans s evalleble to you?	s should <u>off-fire Values Section</u> man	Mads not be
emeg	Managar) sales			

Het Weste Volumes

8. Subtract volumes expected to be reduced by utilizing #6(a) and/or #7(a), from #5(a) and (b).

After subtraction, add wests inventory volumes from #4 to the remainders to indicate net or real volumes.

	. NETV	Total Cubic Fee		
Weste Type	1993	1994	1995) Com come ree
Class A	15.0	15.0	15.0	45.0
Class 8	Williams	Statemen .	-	Name and Advanced Property of the Control of the Co
Class C	- ALTO	Ground Company of Comp	COMMENTS	Annual Control of the
Greater Than Class C	_{comment} 6	succession.		Account Accoun
Mixed Waste	The state of the s	guardin.	-	
Total	15.0	15.0	15.0	1 45.0

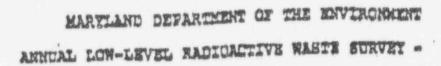
	. NET	AOLIMEZ IN CARI	Total Cubic Fee	
Waste Type	1996	1997	1998	1000.000.000
CassA	15.0	15.0	15.0	45.0
Cass 6	AND ASSESSMENT OF THE PROPERTY	-	Amendura	Thinks
Class C	elyclolocument og file file come anteknissande entonint stat entoninte	MACH		Manager and the state of the st
Greater Than Gass C	AND AND CONTRACT OF THE PROPERTY OF THE PROPER	***	SALAS PA	**************************************
Mixed Waste	granutes A Total Branch Copy of the property of the page	1	-	1
Total	15.0	15.0	15.0	1 45.0

Wana Funa	. NETVO	Total Cubic Fee		
Weste Type	1999			
CassA	15.0.	AND THE PARTY OF T	AND DESCRIPTION OF THE PARTY OF	15.0
Caul	-	•		4,900
Class	deside and the second se	*	The same of the sa	
Greater Than Gass C	control 6		NAME OF THE PROPERTY OF THE PR	
Mixed Waste	-			
Total	15.0			1 15.0

p.	a.)	Will you store wette indicated in #6 Ottolice until December 31, 1999?
10.	4)	Indicate Condito Store of Capacity you wall have by January 1, 1992. for cotal wante values in all 100 Capacity Capacity Capacity Capacity
	b)	englests any additional partition of license amondments you will require for Qr-5122 Storage of water until Document 11, 1998. Will a week license for dedicated storage faithly
500	4)	where is your school with a common of facility by On Facility

After completing this survey, sign and date the front sage. Then mail it back to:

Marardon & Solid Mosto Moregowerk Admin-Maryland Department of the Environment 2000 Encening Highway Saltimore, Maryland 21524 Attention: Riel Thompson בשבי שוב ער יום אוספר בשם אוט אוט אוטף של ער טע של



The Maryland Department of the Environment (MDE) Baxardous and Solid Waste Management (MEMMA) needs your assistance to meet a federally mandated milestone under the 1985 Amendments Act. Read this questionnaire carefully and fill in the information requested. Attach additional information, if necessary.

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		Industrial Hygienist
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	Das Category which best describes your fac	
An () Nuclear Power Plant &	() GCVERNMEHT
8. (1	other nuclear fuel cycle	() State
C	Medical (NON-GOVERNMENT) F. Mespital Laboratory Research	() INDUSTRIAL () Research & Development () Mamufacturing () Decon. Facility & Waste
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		and the same same as the same as I does
than th	the above Regnse(s) redicative watters generates Hicensee adenses above, thick this bes and attent a In complete accresses.	in of tross secucies



Wasse Inventory

4. Estimete volume of Low-Level Radioactive Watta (LRW), NRC Requisted and NARM, that you expect to have in storage on-site as of Lanuary 1993. This should be the amount of LLRW that could not be thisped for dispassal as of December 31, 1982. Refer to 10 CFR Part 61 - 55 for the definitions of Cass A, S, C or greater than Class C Wester.

Also, estimate the volume of billing Waste that you expect to have in storage as of Lanuary 1 1982. Mixed waste refers to that radioactive waste which also contains has are used to the focus resource Conservation and Recovery Act. and defined under 10 CFR Part 61 and 40 CFR Part 35.

Waste Cass	Cass A	Class 8	CIAN C	Greater Than Class C	Mixed Weste	Total Velume
Valume in Cubic Feet	22:5	0	0	0	0	22.5

Grass Wassa Valumes

E. a.) Estimate the volumes of Low-Level Redicactive Weste that you expect to generate using current areatiess.

Weste	CJ. PL	1994 Cu. Pl.	1698 Cal PL	fetal Cubis Feet
Caua	22.5	22.5	22.5	67.5
Cam s	0.	0	U	1 0
CALC	0	0	O	0
Greater Than Class C	0	b	0	0
Pessi	225	12.5	22.5	67.5

Waste	1996 Cu. Pr.	1997 OL P.	1998 OL PC	Total Cubic Fee
Caua	22.5	22.5	22.5	67.5
Cau S	0'	0	0	0
Cass C	0	0	0	1 0
Greeser Trust Class G	0	0	0	0
Fotal	22,5	22.5	22:5	67.5

Wasse Qass	1999 Cu. Pt.	Total Cubic Fee
Cass A	22.5	1 22.5
Car I	0.	
Cass C	0	
Creater Than	0	
Yess	22-5	1 22.5

5.) Szumate the volumes of Mixed Waste that you expect to generate using surrent practices.

	1993 Cu. Ps.	1994 Cu. Pl	1988	Total Cubic Fees
Mixed Waste	0	٥	0	
	1996 Gu. PL	1997 Qu. Pt.	1998	Total Cubic Feet
Missel	0	0	C	() () () () () () () () () ()

0

Misees Masse



Valume Reduction

	4.)	indicated in #\$(a) an	d (b) above (1993)	thest that you will utilize to re through 1999). Also inclease p	ercent of valume
		Compaction		Decontamination	SECRETARIO CONTRACTOR SA
		Inetheretion	W. Carrent Control	Total Valume Reduction	Contrador Contrador No.
	8.)	if you do not use any install any valume re- ##(a) and (b)? What	duction systems in	eduction methods now, do you the future at your facility for w send to install?	lintend to use or restes indicated in
	¢.)	Indicase any addition What is your schedul	al permits or licen s to obtain those p	se amendments you will requirements or license amendments	ri fer 6(a) and (b).
-	d.)	By utilizing on-site w resuction have you a	acta reduction/mil shi eved se far?	nimization mothods, how must	watto volume
	a.)	indicate any <u>STATIS</u> indicated in \$5(8) an that you expect to se	d (b) (1983 throug	geordes that you will utilize the 1995). Also indicate percent	a reduce the volumes at volume reduction
		Super Campaction	Management N	Indinarrion	
		Decomamination _	Springer and Comments of the C	fotal Valuma Reduction	96
	8.)	Indicate any addition volume reduction. W	nel permits or lieza That is your school	ne emerements you will requi	retoutilize off-site canse emandments?
Deste	£.)	Mill die Gwalse Mei	To Berly Clon Ver	ter ship the volume of reduces	weste back to you for
		If not what will hap	een to that wastel	######################################	equella incommend à litterations are firmate
Marco	d_)	By unlizing off-site v	vere reduction se	ruces, how much waste volum	e reduction have you
	4.)	What are your cantil	rgency plans chou	d offisite Volume Reduction	hethods not be



Het Waste Valumes

8. Subtract volumes expected to be reduced by utilizing #5(a) and/or #7(a), from #5(a) and (b).

After subtraction, add weets invertibly volumes from #4 to the remainders to indicate net or real volumes.

Warte Type	. HET VOLUMES IN CUBIC PEET			Total Cubic Feet
	1993	1994	1895 .	10761 #0 m0 1 44
CauA	22.5	22.5	32.5	67.5
Cast	0	0 .	0	A Description of the Control of the
Cant	0	0	C)	A Charles of the Char
Greater Than Gas C	0.	0	0	
Mised Wasse	0	0	0	A STATE OF THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS
Total	22.5	22:5	22.5	67.5

Wene Type	. NET VOLUMES IN CHEIC PEET			Total Cubic Feet
	1996	1997	1998	100010000000
Casa	22.5	22.5	22.5	47.5
Cau 8	0	0.	0	0
Cint	0	. 0 .	C	
Greater Than Gaus C	0.	P	0	0
Mixed Waste	0	0	10	Commence of the second
Petal	72.5	12215	22.5	675

Warte Type	. NET VO	Pessi Cubia Feet	
	1999		
CHA	22.5		22.5
Cau (0	*	10
Cans	0	The second secon	0
Greater Trush Class C	0.		0
MIXAE WARR	0		O Commence
FORM	122.5		22.5

Storege 9. a.) Will you more werrs indicates in #8 On-Size until December 81, 1929? b.) If not then what contingency plans do you have for that wester? be moved tolvew location. indicate Co-Site Tiorage Canadia you will have by January 1, 1993, for total waste volume 10. 2) Indicates in se Cubic Foor Potal Casacity b.) Indicate any editional sentite or license amendments you will require for Qn-Site Storage + Specific License of warte until Documper \$1, 1998. landfor a now Nead Lo Cation.

What is your school to so some nuese permits or il corse amenements? May amend SUMMER

After completing this wivey, sign and dase the front eags. Then mail it back to:

Agrandous & Solid Hests Management Admin-Maryland Department of the Environment 2500 Brosming Highway Baltimore, Manyland 20224 Attention: Miel Thompson

003

MARTLAND DEPARTMENT OF THE ENVIRONMENT ANNUAL LOW-LEVEL RADIDACTIVE WASTE SURVEY -

The Maryland Department of the Environment (MDE) Bezardous and Solid Weste Management (NSWMA) needs your essistance to ment a federally mandated milestone under the 1985 Amendments Act. Read this questionnaire carefully and fill in the information requested. Attach additional information, if necessary.

Address 3094 Go: Her Rd Rockville MD 20850 County Montgomery	L Healt
Departmentalision Office of Health Physics HFZ-60 contact Person Edward A. Tupin The Radiation Screty Office Phone: Area Code (301) 594-4752	er
Addigactive Materials License Numbers NRC 19-07583-01 State	
1. CHECK ONE CATEGORY WHICH BEST DESCRISES YOUR FACULTY: A. (') NUCLEAR POWER FLANT B. (') OTHER NUCLEAR FUEL CYCLE C. () MEDICAL (NON-GOVERNMENT) (') Hospital (') Hospital (') Hospital (') Research (') Research	
2. If under the above (iconse(s) regioactive waste is generated at locations other than the licensee address above, check this box and attach a list of those locations including complete eparesses.	
3. Hyper answers to dd. 2(8) and 2(8) are zero, you need not convolete remainder of this form. Sign below, gate and return was survey. Edward A Tyzin Radiation So feety Officer 2/22/94 Signature of Person Commissions Form	٠



Waste Inventory

4. Estimate volume of Law-Level Radiosctive Watta (LLRW), NRC Regulated and NARM, that you expect to have in storage on-site so of <u>lanuary 1, 1993</u>. This should be the ymount of LLRW that could not be shipped for disposal as of December 31, 1992. Refer to 10 CFR Pert 61 • 55 for the definitions of Class A. B. C or greater than Class C wester.

Also, astimate the volume of Mixed Yverre that you expect to have in storage as of Jacuary 1. 1995. Mixed werte refers to that regioective weste which also comains hazardous waste subject to federal Resource Conservation and Recovery ACL and defined under 10 CFR Part 61 and 40 CFR Part 261.

Waste Class	Class A	Cless 8	Class C	Greater Than Class C	Mixed Weste	Total Volume
Votume in Cubic Peet	. 3	0	0	0	0	3

Gross Waste Volumes

S. a.) Estimete the volumes of Low-Level Radioactive Waste that you expect to generate using current practices.

Waste	1993 QL PL	1994 Cu. Ft.	1995 CAL PL	Total Cubic Feet
CLASS A	85	7.5	75	1 215
Class 8	0.	0	0	1 0
Class C	0	0	0	1 0
Gresser Than Class C	0	0	0.	0
Total	65	75	75	1 215

Weste	1996 CL. Pt.	PART CL. PL	1998 Cal Pe.	focal Cubic Feet
Class A	75	75	75	225
Case 8	0 *	0	0	1 0
Cless C	0	0	0	10
Greeter Than Class C	0	0	0.	0
Tessi	75	75	75	225

Gass	Cu. PL	Total Cubic Fee
Class A	75	515
Class 8	0.	0
Class C	0	0
Greater Than Class C	0	
Total	75	515

b.) Scurrete the volumes of Mixed Weste that you expect to generate using current practices.

-	1998 OJ. Pt.	1994 Gu. R.	1995	Total Cubic Feet
Mixes	15	15	15	45

A section and the section of the sec	199.6 Qu. Pt.	1997 Gu. R.	1998 CAL FE	Total Cubic Feet
Misses	15	15	15	45

	jaga Gu. Pt.	Total Cubic Feet
Mixed	1. 15	105

Note: All "mixed waste" is liquid scintillation vials/cocktail. Which is disposable under current circumstances



Yaiuma	Rectu	CUON
B. 2010-201-11-1-20	1 sales almost	Ameri.

6.	6.)	Indicate On-fite Volume Reduction methods that you will utilize to reduce the volumes indicated in #5(a) and (b) above (1983 through 1996). Also indicate percent of volume reduction you expect to achieve.
		Compection 0 % Decontamination 0 %
		Incineration O No Total Velume Reduction 0 %
		If you do not use any <u>On-Site Volume Reduction</u> methods now, do you intend to use or install any volume reduction systems in the future at your facility for wastes indicated in \$7(s) and (b)? What systems do you intend to instal?
4000	No	one proposed at this time.
	4)	indicate any additional permits or licinse amendments you will require for 6(a) and (b). What is your schedule to obtain those permits or license amendments?
тири	٨	lone
	d.)	By utilizing orusits waste reduction/minimization mothods, how much waste volume reduction have you achieved so far? 30 %
7.	(به	Indicate any <u>Off-Sire Volume Reduction</u> services that you will utilize to reduce the volumes indicated in #5(a) and (b) (1953 through 1995). Also indicate percent of volume reduction that you expect to achieve.
		Super Comparcion 25 % Indinarration 25 %
		Decomposition 0 % Total Volume Reduction 50 %
		indicate any additional permits or license amendments you will require to utilize off-site volume reduction. What is your schedule to obtain those permits or license amendments?
A	ntho	rity to receive back comported waster Requested 11/28/93
		Will the Off-Tre Waste Reduction Vendor ship the volume of reduced waste back to you for
		Here where will happen en there weren't compacted waste to be returned.
2	cint	illation fluid used for heat recovery crashed vicis sent to
	d.)	by utilizing off-site waste reduction services, how much waste volume reduction have you acrossed so far? 25 %
	6.)	aveilable to you?
D	edi	cate additional Space to Storage - possibly install
		pactor on-site

Net Weste Valumes

8. - Subtract volumes expected to be reduced by utilizing #6(a) and/or #7(a), from #5(a) and (b). After subtraction, add waste inventory values from \$6 to the remainders to indicate net or real valumes.

	. HET V	Total Cubic Feet			
Waste Type	1993	1994	1995	19401 64514 1845	
Caus	65.	\$530	30	125	
Cass	0 1	0.	0	1 0	
Class C	0	0 1	0	0	
Greater Than Class C	0.	0	0	1 0	
Mixed Waste	15 *	0 1	0	1 0	
Total	80 1	30	30	1 125	

****	. NET	Total Cubic Feet			
Wane Type	1996	1997	1998		
C355 A	30	30	30	90	
Can 8	0	0 .	0	0	
Canc	0	. 0	0	0	
Gratter Than Gass C	0.	0	0	1 0	
Mixed Waste	0	0	0	1 0	
Total	30	30	30	190	

	. NET VO	Yetal Cubic Feet		
Werte Type	1999		1.000 0000144	
CassA	30.	+	2 45	
Claus 8	0 1	*	10	
Canc	0		10	
Greater Than Gass C	0.		10	
Mixed Waste	0		1 0	
Total	30		1245	

* LSC Viels Shipped January 1994

Net waste volumes are net of waste wid: sposed of fullowing decay in storage. Thus they will not mathematically track as projected from listed volume reduction methods



9.	ها	Will you store weste indicated in #8 Qn-11th until December 31, 19997
	bJ	If not, then what contingency plans do you have for that wester?
10.		Indicate Cn-Site Storage Capacity you will have by lanuary 1, 1993, for total waste volume indicated in #8. Total Capacity
R	mal	ine renewal of license during 1999; Authority to exced
	a)	- recommended 5 year period for holding waste on-site wherisyoursemedle to octain smore parmits or license amendments? Lense ranewal during 1999, Authority to exceed Syear hold
	11 4	accurately predicted.

After completing this survey, sign and date the from page. Then mail is back to:

Mazardous & Solid Waste Management Admin. Maryland Department of the Environment 2500 Broening Highway Baltimore. Maryland 21224 Attention: Siel Thompson

* Additional space has been converted to waste storage.

More space will be made available as waste volumes require

FOOD AND DRUG ADMINISTRATION ADMINISTRATIVE LINES OF RESPONSIBILITY SECRETARY OF HEALTH & HUMAN SERVICES TO FDA LLRW COORDINATOR

DEPARTMENT OF HEALTH AND HUMAN SERVICES

Secretary of Health and Human Services

Donna Shalala, Ph.D.

PUBLIC HEALTH SERVICE

Assistant Secretary for Health

Philip R. Lee, M.D.

FOOD AND DRUG ADMINISTRATION

Commissioner of Food and Drugs

David A. Kessler, M.D.

FOOD AND DRUG ADMINISTRATION

Office of Management and Systems

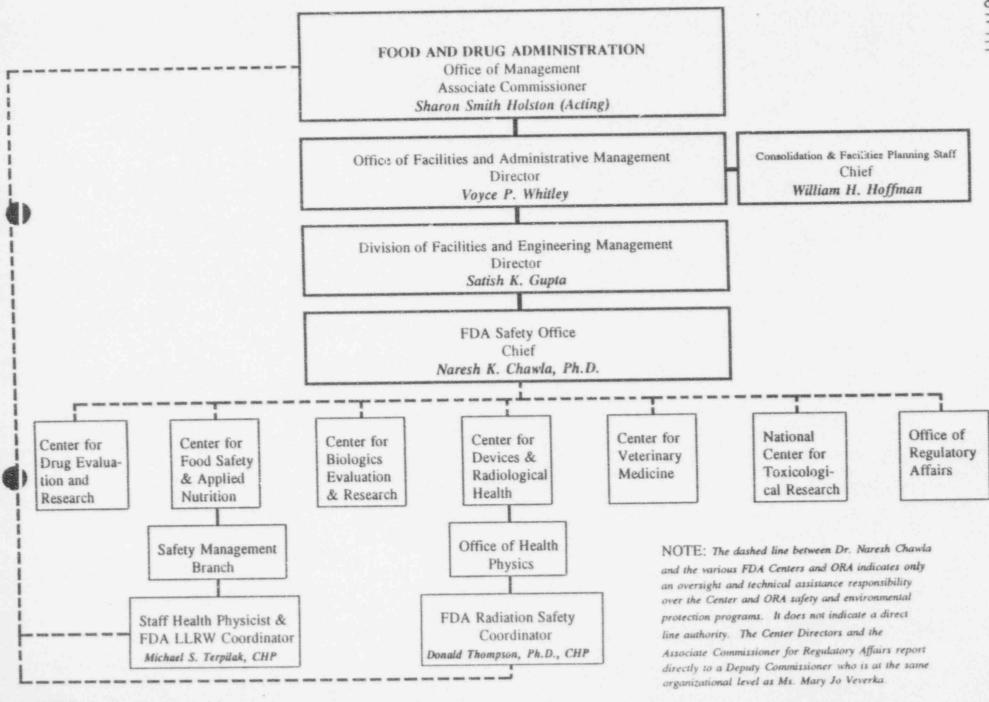
Deputy Commissioner for Management and Systems

Mary Jo Veverka

FOOD AND DRUG ADMINISTRATION

Office of Management Associate Commissioner for Management

Sharon Smith Holston (Acting)



Implies direct oversight.

Implies indirect technical and/or administrative oversight and/or coordination.

08-00412-03 116499

FOOD AND DRUG ADMINISTRATION CENTER FOR FOOD SAFETY AND APPLIED NUTRITION

OFFICE OF MANAGEMENT SYSTEMS DIVISION OF MANAGEMENT SERVICES AND POLICY

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7000, Soc. Exp. Biol. Med. 141, 765 (1972)

Enzyme Induction by Polychlorinated Biphenyls Relative to Known Inducing Agents (36867)

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Special Pharmacological Animal Laboratory, Division of Toxicology, Food and Drug Administration,
Department of Health, Education, and Welfare, Washington, D.C. 20204

Polychlorinated biphenyls (PCB) are mixtures of various chlorinated biphenyl molecules used in industry primarily in closedsystem electrical capacitors and as heat transfer agents. These chemicals were brought to the attention of the scientific community when they were found to be contaminants of wild fish and birds (1-3). Recent interest has focused on their presence in poultry and in poultry by-products (4, 5). As a result of these disclosures, toxicological investigations have dealt largely with the effects of PCB's in poultry (6, 7) and on the toxicity of PCB's to wild birds (2, 8) and fish (9, 10). Mammalian toxicity studies have also shown that there are biochemical consequences of PCB exposure. Nishizumi (11) reported that PCB's manufactured commercially in Japan produce characteristic liver lesions in mice which are detectable by light and electron microscopy, Norback (12) treated rats with chlorinated triphenyls and correlated similar microscopic alterations with deviations from normal liver enzyme function, and Pardini (13) has demonstrated the ability of numerous PCB's to inhibit enzymes located in beef heart mitochondria. Villeneuve et al. (14) studied the sensitivity of oxidative enzymes from the livers of pregmant rabbits treated with PCB and reported an increase in enzyme activity. Similarly, Litterst et al. (15) recently reported that 30-day administration of PCB to rats produces an increase in various microsomal drug-metabolizing enzymes.

Little effort, however, has been devoted to establishing the relative ability of PCB to induce microsomal enzymes as compared with known and widely studied enzyme inducers. The present study reports the ability of equimolar dietary doses of PCB, DDT, and phenobarbital to increase the activity of drug-metabolizing enzymes in the microsomes of rat liver.

Methods. Male Osborne-Mendel rats (100-200 g) were fed a diet containing 1.5, 15, or 150 amoles of either PCB, DDT, or phenobarbital per kg of food. Each dose was fed to six rats for a period of 30 days. The diets were prepared by adding undiluted Aroclor® 1254, p.p'-DDT (99.9%), or phenobarbital sodium to ground Purina Laboratory Chow with mixing, and serial dilutions were made until the desired test concentrations were obtained. To test for uniformity of mixing, diet samples were analyzed for DDT and PCB by gas chromatography; results showed that the concentrations were within 6-8% of the calculated concentrations. Experiments, with appropriate controls, were begun in a staggered fashion over a period of 7 days. Each rat was housed individually and weighed each week. Rats were given free access to food and water, and food consumption was monitored daily. At the end of the 30-day treatment period, rats were killed and their livers were excised. The six livers from each treatment were weighed and then pooled in groups of two for enzyme analysis. Livers were homogenized in ice-cold mannitolsucrose buffer and the homogenate was assayed under conditions previously described (15) for the following microsomal components or enzyme reactions; hydroxylation, N-demethylation, nitroreduction, microsomal protein, and cytochrome P-450 content. Rcsults were analyzed statistically by the Student's ! test.

Results. Food consumption of all animals

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highest dose level. The increase in microsomal content of cytochrome P-450 was similar to the increase seen in microsomal protein content.

Table II shows the relative ability of PCB, DDT, and phenobarbital to increase the activities of microsomal drug-metabolizing enzymes. At the highest dose level all chemicals studied caused a significant increase in enzyme activity, whereas at the lowest dose the only significant increase in activity was produced by DDT on demethylation.

Discussion. The increase in liver/body weight ratio produced by equimolar amounts of DDT, PCB, and phenobarbital (Table I) is a reflection of the ability of these chemicals to increase the absolute weight of the liver, an effect seen here only at the highest dose tested. The similar increase seen in microsomal protein content suggests that this increase in liver weight is probably attributable at least partially to an actual increase in de novo synthesis of hepatocyte protein. The increase in cytochrome P-450 may account for part of the increased protein synthesis and the increase in microsomal enzyme activity might be expected because of the known relation between P-450 and oxidative metabolic activity of microsomes (16). At 150 mmoles/kg, the increases in liver weight and protein content were approximately equal for the three test chemicals: however, at the same dose, phenobarbital produced a 15% increase in cytochrome P-450 content, and DDT and PCB produced 50 and 100% increases, respectively. DDT was the only enzymeinducing compound studied that produced significant increases in protein or P-450 content at doses lower than 150 amoles/kg of food.

Table II shows the ability of the three chemicals tested to increase the activity of specific enzymatic pathways in liver microsomes. At 150 µmoles/kg, PCB consistently produced a greater stimulation in activity than did phenobarbital and had approximately twice as great an effect on reduction and hydroxylation. PCB at this dose also produced a significantly greater increase in activity than did DDT on all but the demethylation reaction, where the effect was equal for

the two inducers. At the two lower doses tested, the effect of PCB on demethylation and reduction was lower than that produced by DDT, but the effect on hydroxylation was higher even at the lowest dose tested. As seen in Table 11, DDT and PCB, both highly chlorinated ecological contaminants, produced the greatest amount of enzyme stimulation. That the inducing ability of DDT appears generally to be somewhat greater than that of phenobarbital in this study is not surprising in view of the successful clinical application of DDT in cases of hyperbilirubinemia where phenobarbital was found to be ineffective (17, 18).

The usual dose of phenobarbital employed to produce maximal enzyme induction is 40-100 mg/kg of body weight administered intraperitoneally for 3 or 4 days. The results of this treatment vary quantitatively from laboratory to laboratory and range from a 15-25% increase in liver weight to a 300% increase in the activity of cytochrome P-450. Tables I and II show that the extremely small dose of phenobarbital used in this study does produce an increase in inducible components of the endoplasmic reticulum, but that the increase is far less in most cases than can be produced by phenobarbital under optimum conditions.

Summary. Enzyme induction by equimolar dictary amounts of DDT, phenoharbital, and PCB was studied in rats after 30 days of treatment. At 150 µmoles per kg of food, PCB was far more effective than phenobarbital and was at least as effective as DDT. At 15 µmoles, phenobarbital, DDT, and PCB produced substrate-specific increases in enzymatic activity.

^{1.} Kocman, J. H., Ten Noever de Brauw, M. C., and de Vos, R. H., Nature (London) 221, 1126 (1969).

^{2.} Presst, I., Jefferics, D. J., and Moore, N. W., Environ. Pollut. 1, 3 (1970).

Holmes, D. C., Sommons, J. H., and Tatton, J. O'G., Nature (London) 216, 227 (1967).

^{4.} Platonow, N. S., and Funnell, H. S., Vet. Rec. 88, 109 (1971).

^{5.} Chem. Eng. News 49(31), 18; 49(34), 30 (1971).

Vos. J. G., and Koeman, J. H., Toxicol. Appl. Pharmacol. 17, 656 (1970).

Time-Course of Induction of Microsomal Enzymes Following Treatment with Polychlorinated Biphenyl

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Division of Toxicology
Food and Drug Administration
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Washington, D.C. 20204

Concern over environmental contamination by industrial chemicals has recently disclosed the widespread presence of polychlorinated biphenyls (PCBs) in various aquatic and terrestrial ecosystems. Several authors have recently documented the ability of PCBs to induce hepatic mirrosomal drugmetabolizing enzymes. LITTERST et al. (1972) have shown that dietary administration of Aroclor 1254 to rats for 30 days produced increases in the activity of some oxidative enzymes and a marked increase in reductive reactions. In addition, LITTERST and VAN LOOM (1972) showed that the inducing activity of RCB on a molar basis was equal to or greater than that of either DDT or phenobarbital. VILLENEUVE et al. (1972) reported that the pentobarbital sleeping time of rats was decreased following dietary administration of several PCB isomers. After parenteral administration of PCB to pregnant rabbits, increases in the activities of certain oxidative liver microsomal enzymes were observed (VILLENEUVE et al. 1971). Recently BICKERS et al. (1972) attempted to correlate changes in mixed-function oxidase activity with chlorine content of administered PCBs. In all studies reported to date, apparently arbitrary durations of exposure to PCB have been utilized to induce the enzymes studied, even though no work has been conducted to determine the optimal inducing dose, the rate at which PCB produces enzyme induction, or how stable the induced enzymes are after PCB administration is discontinued. The purpose of the present communication is to provide information on the latter two questions.

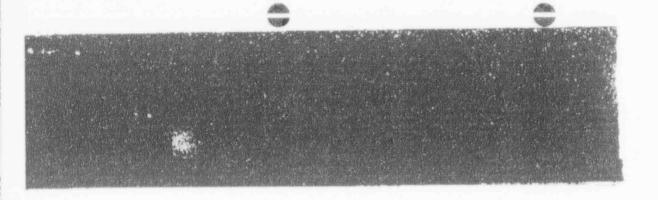
Methods

Male Osborne-Mendel rats weighing 125-150 g were used for all experiments. Rats were housed two per cage, fed Purina Laboratory Chow, and allowed free access to water. For dietary administration of the compounds, Aroclor 1254 (obtained through the courtesy of Monsanto Chemical Co., St. Louis, Mo.) or phenobarbital sodium (PB) were incorporated into the diet at a level of 50 mg of compound per kg of feed (50 ppm) as previously described (LITTERST and VAN LOON 1972). Prior to use, control feed was analyzed for content of PCB and chlorinated hydrocarbon insecticides and found to contain 0.01 ppm PCB and 0.02 ppm DDT (DDT + DDE). For single-dose studies, the agents were administered via stomach tube at a dose of 50 mg/kg of body weight; PCB

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was prepared in corr oil and Pa to 0.55% caline. Control animals were given equivalent volumes of vehicle. Experiments designed for demonstrate the stability of Pin-induced enzymes were conducted by feeding rate a duet containing 10 ppm of Pin for a period of 7 days. A group of rate was then killed (0 time) and microscoupt enzymes and nomponents were determined. The experimental diets were then replaced with control diet for the remaining animals and other groups were killed 3, 7, 10, and 14 days later for analysis.

PCB or PR were each administered to wix fats, control groups also consisted of alk cats. After treatment, the rate were killed by veryical dislocation, and their livers were excised, weighed, and homogenized in mannitule-surrose buffer as previously described buffered in a gold room at 6°C. The six livers from each treatment group were pooled in groups of two each for enryme assays, which were conducted in duplicate. The supermanant fraction from a 9000 x g centrifugation of the liver homogenate was used for assays of Nedemethylation of thelicate introduction of penitroberroic axid, and hydroxylation of literentobarbical, the 9000 x g supermatant was centring pellet was used for determination or microsomal protein and cytochrome P-450 centent, all enzyme and component assays have been described in detail in a previous communication (Litters et al. 1972). Differences between treated groups and control groups were judged significant by a two-tailed Student's g text at Put, 05,

Been The

Table 1 summarizes the results of experiments in which PCB or 88 was fed to rate at a dose level of 50 ppm in the diet. Food consumption and weight gain have been shown to be constant for control and experimental animals at this dose level (LITTERST and VAN LOOK 1972). The 50 ppm dietary level is approximately equivalent to 5 mg PCB or PB consumed per kg of body weight per day. Both PCB and PB produced mignificant increases in levels of heparic microsomal drug-metabolizing enzymes as early as 7 days after exposure. At 28 days, all parameters continued to be elevated but the activities of hydroxylase and demethylase appeared to be increasing at a much less rapid tate than earlier, while natestream reductate and P-450 continued the rapid increase in activity.

The results of oral administration of a single done of 50 mg/kg of PCB or PB are shown in Table 2. Most parameters resulted peak values by 24 hours after treatment, although in animals treated with PCB, hydroxylation apparently did not reach a peak in activity until at heast 48 hours after freatment. The relative quantities of cytechrome P-450 detectable in microsomal peilets appeared to be more closely related to activity of erhylmosphine demothylms than to activity of the other energies studied. PCB

TABLE 1

Development of Induction in Microsomes of Rat Livers Following Dietary Administration

of PCB or Phenobarbital (PB)

Days on Diet	Treat- ment b	Liver: Body Weight Ratio	Protein (mg/g)	P-450 (nucles/ mg)	Deme- thyla- tion (nmoles/ g/30 min)	Nitro- reduc- tion (µg/g/ 30 min)	Hydro- xyla- tion (µs/s/ 30 min)
7.	PCB PB	0.033+0.003 0.037+0.001 0.035+0.004	28.1±0.6 34.6±4.4 33.9±2.2°	0.62+0.02 0.78+0.06 0.78+0.02	4125+438 8750+575 <u>°</u> 8263+1285 <u>°</u>	49,2±7.4 148,1±18,25 105,0±10,25	0.22+0.02 0.44+0.04° 0.40+0.08
14	O	0.033+0.002	21.7+0.7	0.66±0.05	3406±781	57.0±4.5	0.16±0.02
	PCB	0.036+0.002	25.4+0.9	1.03±0.11°	8354±2020 <u>c</u>	149.3±8.6°	0.40±0.04°
	PB	0.034+0.001	23.4+0.9	0.75±0.04	6896±1236 <u>c</u>	88.0±6.2°	0.28±0.01°
28	O	0.030+0.002	29.5±1.5	0.66±0.01	3660±387	60.5±0.5	0.28+0.02
	PCB	0.037+0.004	41.4±1.6⊆	1.28±0.16°	7729±1385 <u>°</u>	212.8±46.0⊆	0.66+0.16C
	PB	0.034+0.003	33.9±1.2	0.86±0.05°	6605±337 <u>°</u>	105.0±7.2⊆	0.40+0.02C

Balance are means ± S.D. of 3 replicates except nitroreductase activity at 7 days where n=2.

Balance are means ± S.D. of 3 replicates except nitroreductase activity at 7 days where n=2.

Balance are means ± S.D. of 3 replicates except nitroreductase activity at 7 days where n=2.

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Balance are means ± S.D. of 3 replicates except nitroreductase activity at 7 days where n=2.

Balance are means ± S.D. of 3 replicates except nitroreductase activity at 7 days where n=2.

Estatistically different from control at P(0.05.

TABLE 2

Effect of a Single Oral Dose of PCB or Phenobarbital (PB) on the Activity of Microsomal

Drug-Metabolizing Enzymes in Rate^a

Mours after Treat-	Treat-	Liver: Body Weight	Protein (mg/g)	P-450 (nmoles/	Dene- thyle- tion	Nitro reduc- tion	Hydro- xyla- tion
ment		Ratio		mg)	(runoles/ g/30 min)	(ug/g/ 30 min)	(pug/g/ 30 mdr)
9	PCB	0,035+0,002 0,037+0,001 0,038+0,002	32.2±0.3 31.6±1.0 32.8±1.3	0.61+0.02	6262+388 4938+840 7104+1315	81,246,2 74,6+3,2 88,7+12,1	0.22+0.01
12	o SCB	0.030+0.002 0.036+0.0015 0.033+0.002	32.5+1.9 36.0+2.2 40.0+1.3	0.65+0.01	5969+219 7417+4495 7281+2215	65.9±3.4 95.5±5.7 <u>c</u> 103.0±2.0	0.26+0.02 0.28+0.02 0.28+0.04
24	0 82	0.035+0.002 0.040+0.001 <u>c</u> 0.039+0.003	26.9+0.3 38.8+1.85 36.0+2.45	0.68+0.08 1.25+0.01 1.25+0.03	7592+192 134.79+1515£ 16354+2153£	76.2+5.8 180.4+41.85 207.7+35.15	0,26+0,03
00 +2	o 82 83	0.035+0.001	32.0+1.0 40.8+4.1 39.4+1.8	0.57+0.01 1.06+0.09 0.93+0.13	5094+654 10875+2378 [©] 12500+2558 [©]	73,8418.8 200.8±28.9€ 169,3±32,5€	0.20+0.02 0.4470.145 0.42+0.095

Values are means + S.D. of 3 replicates.

Bats were given 50 mg/kg PCB or phenobarbital by stomach tube.

Statistically different from control at P(0.05.

and PB both appeared to be equally effective in their abilities to increase microsomal activity and component content, and both generally demonstrated the same approximate rates and extents of induction.

Table 3 shows decay of microsomal enzymes and components following induction by dietary treatment with PCB and PB. The levels of enzymes and components at 0 day demonstrate that all enzymes were induced before the experimental diets were removed and that the amount of induction was comparable to that in other experiments 7 days after dietary treatment (see Table 1). After rats had been fed the control diet for 10 days, values for all enzymes and components except hydroxylation had returned to normal or near-normal. PB-induced enzymes appeared to return to control levels more rapidly than did PCB-induced enzymes.

Discussion

Dietary administration of PCB has previously been shown to increase the activity of microsomal drug-metabolizing enzymes (LITTERST and VAN LOON 1972; LITTERST et al. 1972; VILLENEUVE et al. 1972); Table 1 demonstrates the approximate rate at which this induction occurs. P-450, nitroreductase, and demethylase levels from PB-treated rats appeared to reach the maximum level of induction within 7 days of treatment. In PCB-treated rats, the maximum induction of demethylation had also occurred in 7 days, but P-450 and nitroreductase levels in this group continued to increase during the entire 4 weeks of treatment. Both PCB and PB produced the same qualitative response in hydroxylation and protein content; each compound demonstrated two peaks of activity, one after 7 days and the other after 28 days of treatment, with a decline in activity between the two peaks.

PCB and PB both had the same effect on microsomal enzymes after a single oral dose; activities increased until 24 hours after treatment and then either remained elevated or declined. With both compounds, enzyme activities were still significantly increased over control values 48 hours after the single administration. Six hours after the single dose of PCB, all enzyme activities were slightly decreased. Although this decrease was not statistically significant, it is consistent with unpublished data from this laboratory in which low doses of PCBs (0.5 and 5.0 mg/kg) produced similar trends in these same parameters in three separate experiments.

The results of this study demonstrate that treatment with low dietary doses of PCB or PB produce significant levels of enzyme induction within 7 days and that with PCB, but not PB, this level of induction continues to increase. Single oral doses of PCE and PB produced similar responses in enzyme activity; the activity

 $\label{eq:table 3} \mbox{Stability of Induced Enzymes or Components Following Removal of the Inducing Substance}^{\underline{a}}.$

Days on Control Diet	Treat- ment	Liver: Body Weight Ratio	Protein (mg/g)	P-450 (mmoles/ mg)	Deme- thyla- tion (nucles/ g/30 min)	Nitro reduc- tion (ug/g/ 30 min)	Eydro- xyla- tion (ag/g/ 30 mid
0	O PCB PB	0.032+0.002 0.048+0.003b 0.044+0.001b		0.40±0.01 0.56±0.025 0.48±0.03	4818+254 8727+375 7567±574	42.7+2.2 104.6+16.1 ^b 94.4+4.6 ^b	0,22+0,02 0,47+0,05 0,41+0,04
3	O PCB PB	$\begin{array}{c} 0.037 \pm 0.001 \\ 0.041 \pm 0.001 \\ 0.042 \pm 0.004 \\ \hline \end{array}$		0.48+0.03 0.49+0.03 0.49+0.04	4875±775 8362±512 <u>b</u> 6687±262 <u>b</u>	55.0±4.0 76.5±5.5 <u>b</u> 62.5±3.5 <u>b</u>	0.26+0.04 0.48+0.04 0.38+0.02
3	PCB PB	0.041±0.002 0.049±0.003 ^b 0.045±0.001	44.2+2.4b	0,42±0,03 0,58±0,03b 0,42±0,02	5640+196 10980+770b 6640+315b	46.0±0.6 72.4±10.3 ^b 53.6+6.3	0.28±0.02 0.44±0.085 0.28±0.02
10	O PCB FB	0.042±0.002 0.041±0.002 0.041±0.002	45.0±1.6 47.7±1.1 45.4±2.0	0.38+0.01 0.44+0.015 0.41+0.05	4680±368 5730±531 4800±300	47.2±2.0 57.7±1.95 50.6±1.6	0.28±0.04 0.42±0.02 0.28±0.02

 $^{^{8}}$ Rats were maintained on diets containing 50 ppm PCB or phenobarbital for 7 days; at day 0 the treated diet was replaced with control diet. Values are means \pm S.D. of 3 replicates obtained after the indicated times on control diet.

 $^{^{}b}$ Statistically different from control at P[0.05.

reached a peak 24 hours after dosing and then slowly declined to normal. Discontinuation of PCB or PB resulted in a slow decay of the induced enzyme activity to approximately control steady-state levels after 10 days. The enzyme activity in PB-treated rats returned to normal somewhat more rapidly than did that in PCB-treated rats.

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TOXICOLOGY AND APPLIED PHARMACOLOGY 37, 319-330 (1976)

The Effect of Lindane and Phenobarbital on Microsomal Enzyme Induction in Dogs and Miniature Swine¹

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The Effect of Lindane and Phenobarbital on Microsomal Enzyme Induction in Dogs and Miniature Swinc, FARBER, T. M., SMITH, E. J., EARL, F. L., AND VAN LOON, E. J. (1975). Toxicol. Appl. Pharmacol. 37, 319-330. The enzymic activities of 9000g supernatant fractions obtained from the livers of normal beagle dogs and miniature swine and of dogs and swine treated with lindane and phenobarbital are presented. No significant sex differences in activities were noted in control dogs. Pseparations from dogs of both sexes fed lindane at 7.5 and 15.0 mg/kg exhibited a significant loss in codeine demethylase activity while nitroreductase activity was increased twofold. Phenobarbital pretreatment of dogs and swine stimulated all microsomal systems tested. Addition of lindane to the diet of these induced dogs caused a significant and rapid decline in the values after only two feedings. Enzymes induced to a greater extent in dogs by phenobarbital were inhibited to a greater extent by lindane; i.e., as a class, demethylases were affected by both lindane and phenobarbital to a greater extent than aromatic hydroxylases. In contrast, administration of lindane to phenobarbitaltreated swine caused an actual further increase in demethylase activities. A decrease in the induced state was observed in aromatic hydroxylation, azo-reduction, and nitro-reduction reactions, although the activities of these enzymes were still higher than the values from control swine.

he large-scale production and consumption of a wide variety of xcnobiotics is of creasing concern since the ultimate biological effects arising from the chronic ingestion various combinations of pesticide residues, drugs, food additives, and contaminants our food, water, and air are poorly understood. Chlorinated hydrocarbon insectides have been shown by many workers to be inducers of liver microsomal enzymes at accelerate the metabolism of many foreign compounds, including drugs and emicals. The stimulatory effect of chlordane on drug metabolism and its subsequent fect on hexobarbital sleeping time in the rat are well known (Hart et al., 1963). Similar fects were observed with other organochlorine insecticides (Hart and Fouts, 1963, 65; Gerboth and Schwabe, 1964; Azarnoff et al., 1966).

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THE SHOP SHIP IS DESCRIBED

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Studies by Radomski and Fiserova-Bergerova (1967) in the United States and by Brown (1967) in Canada indicate that lindane³ residues have been found in human fat but relatively little is known about the effect of this agent on drug metabolism in mammals. Hexobarbital sleeping times were shortened in rats pretreated with large single doses of α-, β-, or γ-hexachlorocyclohexane (Ghazal et al., 1964). Schwabe and Wendling (1967) observed that DDT and lindane are rather potent inductive agents in the rat, and Welch et al. (1971) demonstrated that lindane can stimulate the metabolism of estrone by rat liver microsomal enzymes. Except for the work of Wagstaff and Street (1971), in which the inductive effects of lindane were studied in the guinea pig, other studies on the effect of lindane on the metabolism of foreign agents have been limited to the rat (Kolmodin-Hedman et al., 1971; Chadwick et al., 1971).

The knowledge of the comparative biochemical pharmacology of lindane is potentially important in view of the frequent differences in drug metabolism between species and between sexes within a given species (Gilictte, 1963). In an effort to provide additional comparative data on drug-pesticide interactions we conducted experiments with dogs and miniature swine and chose phenobarbital and lindane as model xenobiotics. We report normal baseline data for the *in vitro* activities of microsomal enzymes in the dog and miniature swine and compare activities after the chronic ingestion of lindane. Results from studies on the effect of challenging phenobarbital-treated dogs and swine with lindane are also presented.

METHODS

Previous unpublished research in our laboratory revealed that lindane, fed to dogs at a dose of 30.0 mg/kg per day, caused signs of neurotoxicity within I-2 weeks and death in 6-8 weeks, whereas overt toxicity was not apparent in dogs administered lindane at 7.5 mg/kg. Consequently, 15 purebred beagle hounds (8 males and 7 females; approximately 6-8 months of age) were fed a Purina meal containing finely ground lindane* at a dose of 7.5 or 15 mg/kg per day for 19 weeks. After anesthesia with diethyl ether, both control (12 males and 6 females) and lindane-treated dogs were routinely sacrificed between approximately 9:00 and 10:00 AM (19 hr post-feeding). Strict adherence to this schedule minimized possible differences due to a circadian rhythm in metabolism (Radzialowski and Bousquet, 1968). Livers obtained from dogs were rapidly perfused with isotonic saline and 50-g specimens were briefly homogenized in a prechilled blender for 10 sec with two volumes of 1.15% KCl at 4°C. Homogenization was continued in a Tefion-glass homogenizer at 4°C for an additional 30 sec. The 9000g supernatant fraction was obtained by centrifugation at 10,400 rpm for 30 min in an International refrigerated centrifuge, Model PR-2, equipped with a high capacity attachment. One milliliter of the 9000g supernatant fraction (equivalent to 0.33 g of liver) was added to flasks containing: glucose 6-phosphate (50 µmol), magnesium chloride (25 µmol), nicotinamide (50 µmol), NADP (1.5 µmol), and yeast glucose-6-phosphate dehydrogenase (2.5 Kornberg units). Phosphate buffer (0.1 M, pH 7.4) was added to adjust the final volume to 5.0 ml and the following substrates, in aqueous

y Isomer of hexachlorocyclohexane. Also referred to as y-benzene hexachloride (y-BHC).
 Provided by Hooker Chemical Corporation, Stamford, Connecticut 06905.

solution, were added to separate flasks: 10 µmol of aminopyrine, codeine, or aniline; 5 µmol of N-methylaniline or ethylmorphine, 6 µmol of p-nitrobenzoic acid and 3 µmol of zoxazolamine or p-nitroanisole. Forty micromoles of semicarbazide hydrochloride was added to flasks containing substrates to be demethylated, and formaldehyde was measured by the Nash (1953) procedure as modified by Stitzel et al. (1966). Flasks were shaken (90–100 rpm) at 37°C for 30 min in a Dubnoff metabolic incubator.

Conversion of aniline to <u>p-aminophenol</u> was determined colorimetrically after deproteinization with trichloroacetic acid (Imai et al., 1966). Zoxazolamine hydroxylation was measured spectrophotometrically after extraction into a 1.5% solution of isoamyl alcohol in heptane (Juchau et al., 1965). Nitroreductase activity was determined by measuring the p-aminobenzoic acid formed from p-nitrobenzoic acid during incubation under a stream of nitrogen (Fouts and Brodie, 1957).

Blood was routinely drawn at biweekly intervals for the determination of serum alkaline phosphatase (Kind and King, 1954) and for the detection of lindanc and its metabolites in plasma. One milliliter of plasma was extracted with 19 ml of hexane for gas-liquid chromatographic analyses of chlorinated hydrocarbons, and generally 5-10 µl of the hexane extract was injected into the column. Retention data were obtained by using a Packard Model 838 gas chromatograph equipped with an electron capture detector. A coiled column (6 ft × 5-mm inner diameter) was packed with 6% DC-200 silicone on 80-100-mesh Gas-Chrom Q. Column temperature was maintained at 200°C and the nitrogen carrier gas flow rate at 120 ml/min.

In the second experiment, 29 purebred beagle dogs (15 males and 14 females) were fed powdered phenobarbital mixed in a commercial chow at a dose level of 35 mg/kg per day. Two dogs were sacrificed as described above at Days 5, 13, 20, and 41 to determine the extent of hepatic microsomal enzyme induction. Beginning at Day 21, powdered lindane was included in the phenobarbital-containing dietary meal at a level of 30 mg/kg per day. Subsequently, dogs (3 per day) were sacrificed at 23, 26, 30, 33, 37, 39, and 45 days after the initiation of the experiment.

An autopsy was performed on the dogs in both of the above studies for gross pathological lesions. Samples were taken from the brain, spinal cord, sciatic nerve, thyroid, thymus, lung, heart, liver, gall bladder, kidney, urinary bladder, adrenals, pancreas, stomach, small intestines, colon, spleen, testes, ovaries, uterus, and skeletal muscle tissue and were fixed in buffered formalin for evaluation by light microscopy.

Ten miniature Hormel-Hanford swine of both sexes, when 4 months old, were started on a diet containing phenobarbital at a dose level of 25 mg/kg per day. After the diet had been fed for 8 months, lindanc at a dose level of 50 mg/kg per day was co-administered along with the phenobarbital in the diets of five of these pigs for a 6-day period. On the day before the administration of the lindane and on Days 3 and 6 of lindane administration, blood samples were taken from all of the pigs for serum phenobarbital determinations by a modification of the method of Cooper and Brodie (1955).

The miniature swine were killed by exsanguination, and their livers were quickly removed and rinsed in ice-cold mannitol (0.25 M)-sucrose (0.07 M) solution. The livers were minced and then homogenized in additional ice-cold mannitol-sucrose solution, using a Potter-Elvejhem tissue grinder with a Teflon pestle and a constant torque motor. The homogenate was centrifuged at 9000g for 30 min in an International PR-2

refrigerated centrifuge equipped with a high capacity attachment. The final concentration of the 9000g supernatant was adjusted with mannitol-sucrose so that 1 ml was the

equivalent of 200 mg of liver tissue.

The 9000g supernatant fraction was used to study the following enzyme pathways: N-dealkylation of aminopyrine (10 µmol), codeine (10 µmol), and ethylmorphine (5 μmol) to formaldehyde, measured by the method of Cochin and Axelrod (1959); side-chain oxidation of [14C]pentobarbital (1 µmol) to hydroxylated metabolites by the method of Kuntzman et al. (1967); p-hydroxylation of aniline (10 µmol) to p-aminophenol by the method of Imai et al. (1966); anaerobic azo reduction of 1,2-dimethyl-4-(p-carboxyphenylazo)-5-hydroxybenzene (5 µmol) to p-aminobenzoic acid and anaerobic nitro reduction of p-nitrobenzoic acid (10 µmol) to p-aminobenzoic acid by the method of Smith and Van Loon (1969).

Each flask contained 1 ml of the 9000g supernatant, 1 ml of the appropriate substrate in aqueous solution, and 3 ml of the incubation medium containing 50 µmol of nicotinamide, 25 µmol of megnesium chloride, 25 µmol of glucose 6-phosphate, and 0.6 µmol of NADP dissolved in 0.5 M K2HPO4-NaH2PO4 buffer at pH 7.4. In addition, all demethylation flasks contained 0.1 ml of a 5% semicarbazide hydrochloride solution.

Flasks used for demethylation and p-hydroxylation reactions were incubated at 37°C for 30 min in an oxygen atmosphere. Flasks containing [1+C]pentobarbital were incubated for 15 min at 37°C in an oxygen atmosphere and those used for the azo- and nitro-reduction reactions were incubated for 30 min at 37°C in a nitrogen atmosphere. All flasks contained small plastic balls to ensure adequate mixing of the incubation mixture in the Dubnoff shaking incubator.

RESULTS

Data presented in Table 1 indicate no statistically significant differences in in vitro microsomal drug-metabolizing activities between control male and female beagle dogs with regard to the seven substrates examined in the study. Data in this and the subsequent tables were analyzed for statistical significance by the Student's t test; p < 0.05was considered to be statistically significant. The effects of lindane on microsomal activities were essentially identical at the 7.5- and 15-mg/kg dose levels and therefore the values from the two groups were combined for presentation in this table.

The 9000g supernatant fractions of liver from lindane-treated dogs of both sexes exhibited a significant loss in codeine demethylase activity (47-58%; p < 0.001); conversely, the nitroreductase activity of these preparations was significantly enhanced (85-110%; p < 0.001). Lindane had no effect on the in vitro microsomal metabolism of the other substrates examined, although it produced significant increases in the relative liver weights of the animals of both sexes.

A gradual but statistically significant elevation in alkaline phosphatase activity was seen; values increased from a normal mean of 8.2 ± 3.6 (SD) King-Armstrong U/100 ml of serum to 21.5 \pm 5.2 and 67.8 \pm 6.8 U in dogs given 7.5 and 15 mg/kg, respectively. A toxic effect on the liver was indicated by scattered degenerating hepatic cells or focal liver areas and individual hepatic cells with vacuolated cytoplasm, giving the cells a foamy appearance. No other tissue had histopathologic changes associated with the administration of lindane.

changes in the liver (Litchfield and Conning 1972; Farber et al., 1970). However, the microscopic findings of some modest degree of hepatic toxicity caused by lindane alone, in conjunction with the observed elevation in serum alkaline phosphatase activity, would indicate that the liver in these animals is in a rather complex state, perhaps analogous to the hypertrophic, hypoactive state seen with high levels of dieldrin as described by Hutterer et al. (1968).

Sesame et al. (1968) have also observed rapid suppression of microsomal mixed oxidases after carbon tetrachloride was administered to phenobarbital-pretreated animals. Under their conditions, a 49 % decrease in liver ethylmorphine demethylation concomitant with significant losses in cytochrome P-450 in both liver and adrenal microsomes was noted shortly after carbon tetrachloride administration. Puri et al. (1971) have reported that an increase in hexobarbital sleeping time and chloroform lethality

occurred in phenobarbital-treated rats exposed to chloroform vapors.

The rapid decline in microsomal activities from the highly induced state associated with phenobarbital administration to control levels in dogs following subsequent lindane administration leads to the speculation that two different types of microsomal enzymes which metabolize the same substrate may exist. One type may be more sensitive to the inhibitory effects of lindane, or perhaps its synthesis is more readily affected by lindane. Lindane had little effect on the aminopyrine demethylase activity of normal dogs but had a great inhibitory action on this enzyme from phenobarbital-treated dogs; this might indicate that the aminopyrine demethylase from phenobarbital-treated dogs is a different form from the "normal" enzyme. Codeine demethylase activity was inhibited in lindaue-treated dogs and was markedly inhibited in the phenobarbitalinduced dogs given lindane, whereas nitroreductase activity was significantly increased in the lindanc-treated dogs and only modestly inhibited in the phenobarbital-induced dogs, suggesting differences in enzyme sensitivities in the same microsomal preparation. Consideration should be given to the possibility that newly induced membranes of the phenobarbital-stimulated endoplasmic reticulum are more subject to changes caused by lindane than are noninduced membranes.

The phenobarbital-treated pig responded to lindane in a manner opposite to that seen in the phenobarbital-treated dog. The microsomal enzymes involved in reduction and hydroxylation were inhibited to a greater extent than those involved in demethylation. The levels of activity remained elevated, whereas in the beagle dog all activities fell to normal levels. In fact, in the phenobarbital-treated pig, lindane caused additional increases in demethylation activity. It is possible that the rate of enzymic synthesis and destruction is higher for reductase and hydroxylase enzymes in the pig than in the dog. Another explanation may lie with the metabolism of lindane in the dog and pig; chromatographic analysis of dog blood indicated the presence of lindane and two unidentified peaks but only one peak (lindane itself) has been found in the pig (Smith et al., 1969). The differences in the influence of lindane on microsomal metabolism in the dog and pig may be due to effects caused by lindane metabolites in the dog or may be due to unknown intrinsic differences in enzyme sensitivities in these different species.

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Food and Drug Administration Washington DC 20204

January 13, 1994

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United States Nuclear Regulatory Commission Region I 475 Allendale Road King of Prussia, PA 19406-1414

Attn: Mohammed M. Shanbaky, Chief

Research & Development Section

Division of Radiation Safety and Safeguards

License No. 08-00482-03 Docket No. 030-03917 Control No. 116499

Dear Dr. Shanbaky:

This is in reference to your letter dated November 2, 1993 requesting additional information on the Decommissioning Funding Plan (DFP) submitted to your office by the Food and Drug Administration (FDA) Center for Food Safety and Applied Nutrition (CFSAN). I trust this letter and enclosures will be sufficient to expedite the evaluation of our license renewal request.

I would appreciate the transmittal of all correspondence relative to the licensing of these facilities directly to Mrs. Dorie Waddick, Radiation Safety Officer for the Center for Food Safety and Applied Nutrition (CFSAN) Safety Management Branch (SMB).

Please communicate directly with her at the following address:

Dorie Waddick, Radiation Safety Officer U.S. Food and Drug Administration Safety Office, Mail Code HFS-657 Room 6113 200 "C" Street, S.W. Washington, DC 20204

(202) 205-4281

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OFFICIAL RECORD COFY 10. 10 JAN 1 4 1994

Page 2 Thank you in advance for your utmost cooperation and attention in this matter. Sincerely, Dorie Waddick Dorie Waddick Radiation Safety Officer cc: N. Chawla D. Thompson W. Hoffman M. Terpilak

Responses to Nuclear Regulatory Commission Request for Additional Information

Prepared by

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In accordance with

FDA Purchase Order FDA 2571840094TD00

January 12, 1994

RESPONSES TO NRC QUESTIONS

INTRODUCTION

On November 16, 1992, the Food and Drug Administration (FDA) submitted a Decommissioning Funding Plan (DFP) and a Letter of Intent to provide financial assurance for Nuclear Regulatory Commission (NRC) License No. 08-00482-03 (Docket No. 030-03917). In a letter dated November 2, 1993, the NRC requested additional information. This document provides responses to these NRC requests for additional information. In preparing this document, the information contained in the referenced documents and information received from FDA documents and from interviews with FDA personnel have been utilized.

NRC QUESTIONS AND RESPONSES

Question 1.

Table 2, "Acceptable Surface Contamination Levels" of your submittal states that the limit for removable contamination for natural thorium and other isotopes in that group is 1000 dpm/100 cm². You state that the source for this table is the NRC Regulatory Guide 1.86, Table 1, 1974. The contamination limit for these isotopes listed in Regulatory Guide 1.86 is 200 dpm/100 cm². Please confirm that you will use a removable contamination limit of 200 dpm/100 cm² for natural thorium and other isotopes in that group.

Response to Question 1:

We confirm that it is the FDA's intent to utilize the limits of Regulatory Guide 1.86, Table 1, 1974, in decontamination and decommissioning these FDA facilities. The value of 1000 dpm/100 cm² listed in Table 2 of the DFP is a typographical error. The correct value is 200 dpm/100 cm².

Question 2.

Page 2-21 of your submittal states that "before the early 1970's, radioactive liquid sastes were disposed of into the Beltsville Research Facility, (BRF) septic system." You also state that you will take soil samples (just prior to commencing decommissioning of the facility) to determine how much, if any, radioactive material is in the soil. Please review the disposal records for this time period to determine if the material released was in accordance with 10 CFR Part 20. If so, you need not include this material in your DFP. If this determination cannot be made with certainty, you must evaluate the amount and extent of contamination and propose what steps will be taken to remediate the situation at this time.

Response to Question 2:

At the request of the General Services Administration (GSA), the firm of Greenhorne & O'Mara, Inc. (G&O) conducted a Phase II initial environmental site assessment at the FDA Beltsville, Maryland, site prior to further development of the site. The study was designed as an initial environmental assessment to survey the site for potential chemical and radioactive contaminants due to past releases of hazardous materials/hazardous wastes or other contaminants. The field work for this study was performed from April 2 through May 7, 1993, and is reported in "Final Phase II Initial Environmental Site Assessment for the U.S. Food and Drug Administration - Beltsville Site, Prince Georges County, Maryland." Soil and water samples were taken from the septic system area of the BRF. The samples were:

- two monitoring wells were advanced in the site; one split spoon sample and one ground water sample were collected from each of these wells, and
- eight soil samples were collected from eight different test pits that were dug up to cover the entire septic drain field area.

The samples were analyzed by a certified laboratory for gross alpha, beta, and gamma activity, and on positive detection a complete analysis was conducted. The data was

also evaluated by a certified Health Physicist. The study concluded, "Based on the existing sample analytical results, it is concluded that the radioactive levels observed are all within acceptable levels for naturally occurring radionuclides." A copy of pertinent pages from the radiological assessment portion (Appendix H, Radiological Assessment) of the G&O study are attached (Attachment 1).

Question 3:

Page 2-21 further states that waste material was reportedly buried on the BRF Site in the early 1970's. This must be fully evaluated to determine the validity of this claim. If this is true, the nature and extent of the contamination must be evaluated. If the material was buried and was not in accordance with 10 CFR Part 20 regulations at the time of burial, you must propose the steps which will be taken to remediate the situation at this time.

Response to Question 3:

An individual was interviewed who reported seeing waste material buried on the BRF site. The nature of the material which was buried is unknown. The material was contained in a paper bag like those used for animal feed. The individual is unsure when the event occurred, but believes the incident occurred sometime between 1971 and 1975. Inspection of the wooded area where the alleged burial took place disclosed a sump/well pump part, sheet steel, bottles, and miscellaneous trash. From the nature of the debris contained in the wooded areas surrounding the BRF, it appears that there has been a continuing history of material being dumped in the wooded areas.

In the conduct of the site survey, G&O documented a debris dump area located north of the BRF septic system drain field. This dump area contains wood, masonry, and metal debris which, in some instances, can be identified as scrap material from the BRF. G&O took soil samples from this dump area and found no evidence of radioactive material above natural background.

Since access to the areas where debris has been located is not controlled, no definitive conclusion can be made as to the source of the trash, whether from FDA personnel or from community sources. However, due to the nature of the debris, there is reasonable probability that at least some of the discarded material is from the BRF.

The NRC issued license Amendment No. 35 to the FDA to permit use of radioactive materials at the BRF. Following the issuance of Amendment No. 35, dosed animal carcasses were disposed of by on-site incineration and liquid and solid

radioactive waste was disposed of by use of a licensed disposal contractors.

Accordingly, there appears to be no incentive for FDA personnel to dispose of radioactive materials in the wooded area. However, there is apparently a long history of disposal of waste materials by "dumping it in the woods." Thus, no conclusions can be made about what the bag contained.

The BRF was added to the FDA license by Amendment No. 35, dated January 27, 1975. Prior to that time no use of radioactive material was authorized by the NRC. However, a review of research papers and interviews with available FDA research personnel who were employed at the BRF between 1968 and 1975+ indicates that radioactive materials were used prior to receipt of Amendment No. 35 in 1975. There is no assurance that materials containing radioactivity were not discarded in the woods surrounding the BRF. FDA will investigate further whether the radioactive portions of these studies were conducted at BRF.

In view of the above, the FDA has concluded that it will be necessary to evaluate the need for further environmental surveys of the areas surrounding the BRF facility. The FDA will provide the NRC with technical details of this evaluation when program plans are finalized.

Question 4:

Regulatory Guide 3.66 (enclosed) recommends that a contingency factor be included in the decommissioning cost estimate. You inferred a contingency factor of \$250 000 (21 %) by including \$150,000 for the HVAC system in Federal Building 8 and \$100,000 for the remediation of the BRF site. Incorporating a contingency factor in the cost estimate helps es sure that you are prepared for unexpected circumstances that could raise decommissioning costs. The more conservative approach is to include all possible known costs and incorporate a contingency factor for truly unexpected costs. NUREG/CR-1754 Technology, Safety and Costs of Decommissioning Reference Non-Fuel-Cycle nuclear Facilities, and NUREG/CR-1754 Addendum 1 (Enclosed), use a contingency factor of 25 percent in the cost estimates for each of six reference laboratories. Incorporate a contingency factor of 25 percent into the decommissioning cost estimate or you may choose to use a lower contingency factor if you can show why a lower factor is appropriate.

Response to Question 4:

In preparation of the cost estimates reported in the cost tables of the DFP, a contingency factor was utilized. This factor was not explicitly reported in the tables. For example, the final radiological survey was based upon a cost basis of \$15 per wipe sample. The current cost (December 1993) for radiological wipe samples in the Washington, DC, area is less than \$11 each. When this final survey contingency (\$83,600) is added to those for the HVAC and the BRF site remediation, the total is \$333,600 which represents about 28 percent of the total cost estimate. Accordingly, it is concluded that the contingency requirement of 25 percent is adequately met and that no further financial commitment is needed.

Question 5:

You have submitted cost estimates for decommissioning which appear to be adequate, however, it is difficult to be certain without knowing the average and maximum amount of radioactive material used in each location as well as the average radioactive contamination found in areas such as fume hoods, glove boxes, floors and laboratory benches. Please supply this information to enable us to compare your estimates with those found in NUREG/CR-1754 AND NUREG/CR-1754, Addendum 1.

Response to Question 5:

To assist you in your assessment, an inventory of the radionuclides in use at the four FDA facilities in February 1993 is provided below:

	ISOTOPE INVENTORY (micro curies)				
Facility	H-3	C-14	P-32	S-35	
FB 8	10,069	42,320	250	1,170	
MOD I	40,970	20,946	600	500	
BRF	1,210	18,483	NONE	NONE	
CVM	NONE	10,800	NONE	NONE	
TOTAL	52,249	92,549	850	1,670	
LICENSE LIMIT	10x10 ⁶	400,000	200,000	200,000	

Prior to preparing the DFP, a scoping radiological survey was conducted by Ecology Services, Inc., to define the amount of decontamination that might be required at the time of decommissioning of each of the FDA facilities. This survey, which was submitted to the NRC with the DFP, was not designed to be extensive, but was intended to provide guidance in establishing a basis for cost estimates. Representative laboratories and associated equipment were surveyed. The results of this survey are summarized below:

FB-8 The areas surveyed included 30 laboratories/cold rooms, animal cage washing area, incinerator and incinerator room, and accessible portions of the HVAC air handling system. The results of the survey showed radioactivity above instrument background in one lab sink (800 gcpm) and on concrete flooring in the vicinity of the incinerator (500 gcpm/18.5 cm² beta). All other survey results were negative, i.e., no detectable radioactivity above instrument background was located.

Module 1 The areas surveyed included only the air handling system for the fume hoods. Laboratories were not surveyed since, at the time the DFP was prepared, only limited or no radioactive materials had been used in those MOD 1 facilities designated for radioactive material use. No detectable radioactivity above instrument background was observed in the areas surveyed.

BRF The incinerator, five laboratories, 20 vivarium floor drains, and HVAC system components were surveyed. No radioactivity above instrument background was detected.

CVM The two incinerators, seven laboratories and their exhaust ducts, and an old manure compost pile were surveyed. A low level of radioactivity was detected in one laboratory sink (250 gcpm). The manure compost pile exhibited radioactive response (150 gcpm/18.5 cm²) similar to undisturbed soils in the area.

In addition, the routine surveys of the FDA facilities were reviewed and considered in preparing the bases for decontamination cost estimates. A sample of the surveys, covering the time of June 1992 through December 1992 are attached (Attachment 2) for your information.

Question 6:

Please submit documentary evidence that the parties signing the letter of intent are authorized to represent the Department of Health and Human Services in the transaction.

Response to Question 6:

The responsibilities of Ms. Sharon Smith Holston, the Food and Drug Administration Associate Commissioner for Management and Operations, are described in the Position Description. As identified in Part III, she is "authorized to speak for and commit the Commissioner and the FDA on administrative management matters." Further guidance can be found in the FDA Staff Manual Guide FDA 1405.3 "Delegation of Administrative and Financial Management, Authority to the Associate Commissioner for Management and Operations." Copies of these documents are presented in Attachment 3. At this time, Mr Donald Sauer has assumed the position of the Food and Drug Administration Associate Commissioner for Management and Operations.

Question 6:

Please submit documentary evidence that the parties signing the letter of intent are authorized to represent the Department of Health and Human Services in the transaction.

Response to Question 6:

The responsibilities of Ms. Sharon Smith Holston, the Food and Drug Administration Associate Commissioner for Management and Operations, are described in the Position Description. As identified in Part III, she is "authorized to speak for and commit the Commissioner and the FDA on administrative management matters." Further guidance can be found in the FDA Staff Manual Guide FDA 1405.3 "Delegation of Administrative and Financial Management, Authority to the Associate Commissioner for Management and Operations." Copies of these documents are presented in Attachment 3.

ATTACHMENT 1

GREENHORNE & O'MARA

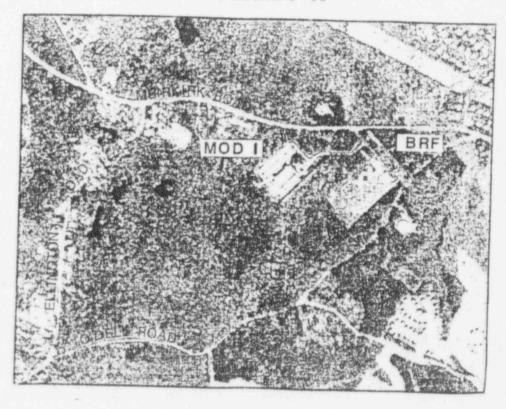
PHASE II INITIAL ENVIRONMENTAL SITE ASSESSMENT

APPENDIX H

(Selected Pages)

Phase II Initial Environmental Site Assessment For The U.S. Food and Drug Administration Beltsville Site

Prince Georges County, Maryland Volume II





Submitted to:

Gene al Services Administration National Capital Region

7th & D Streets, SW Washington, DC 20407

Contract No. 11P92EGD0002 Work Order No. P1193EG0072

Prepared by:



October 1993



FINAL

PHASE II

INITIAL ENVIRONMENTAL SITE ASSESSMENT

FOR THE

U.S. FOOD AND DRUG ADMINISTRATION - BELTSVILLE SITE

PRINCE GEORGES COUNTY, MARYLAND

VOLUME II

Submitted to:

General Services Administration National Capital Region 7th & D Streets, SW, Room 7600 Washington, D.C. 20407

Prepared by:

Greenhorne & O'Mara, Inc. 9001 Edmonston Road Greenbelt, Maryland 20770

October 1993

APPENDIX H

RADIOLOGICAL ASSESSMENT-PACIFIC NUCLEAR REPORT

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1.0 EXECUTIVE SUMMARY

Pacific Nuclear completed a radiological assessment of the FDA Beltsville site for the Phase II Site Assessment. The assessment's purpose was to establish a baseline of the naturally occurring radioactivity inherent in the environment and to identify any residual radioactivity resulting from research operations.

The results of the assessment indicate that no significant radioactivity contamination exists on or near the site. The sample analytical results indicate levels within anticipated range of average naturally occurring radionuclides for the geographical area. It is concluded that the radioactive levels identified are within acceptable levels for naturally occurring radionuclides.

A Certified Health Physicist (CHP)* completed field radiation measurements during all field activities at the site. No measurable radiation levels were observed in excess of background during the field activities which consisted of:

- soil borings for split spoon sampling
- installation of ground water test well
- equipment surface sampling prior to removal from the controlled area.

A total of 57 samples were collected, consisting of 41 soil samples and 16 water samples. The samples were prepared for shipment to the analytical lab in accordance with all regulatory requirements. Chain-of-custody documentation was prepared for all samples.

* A CHP must pass an extensive examination process and become certified by the American Board of Health Physics.

The sample results indicate small levels of radioactivity above the laboratory's lowest limit of detection. The levels are attributable to the presence of naturally occurring radionuclides. The analytical results do not indicate any level of radioactive contamination attributed to past or present licensed activities.

A records search was completed to obtain all available documents related to the use of radioactive materials at the site. These documents included licenses, inspection reports, notices of violation and other miscellaneous records. The documents were obtained from various sources including the NRC Public Document Room and the Region II Nuclear Regulatory Commission (NRC) office. An analysis to identify radioactive disposal limits and practices was completed. Although several violations were documented between May 10, 1980 through July 18, 1991, only two specific instances involving the disposal of licensed material were identified. One incident involved inadequate inventory records for the receipt, use and disposal of licensed material for periods as long as one month. The second incident involved the disposal of radioactive material to the sanitary sewer system that were not recorded. Per discussion with the cognizant site CHP, this incident occurred at the U.S. Department of Health and Human Services, Food and Drug Administration facility at Washington, D.C. Records of activity concentrations and total activity released were not maintained. Corrective actions for these violations have been undertaken. The impact of the undocumented, disposal of radioactive material was assessed as minimal based on the results of the samples obtained from the sewage tank area. No indication of radioactive contamination was present.

The laboratory analytical results were reviewed for the 41 soil samples and 16 water samples. The results included samples that indicated levels of activity slightly above the normal radioactive background levels for the geographical area. Detailed results are found in Section 4.0.

2.0 DATA COLLECTION

The FDA-Beltsville Research Facility is located in a wooded rural setting in the northern part of Prince Georges County. The site is about 200 acres in area and houses test laboratories, administrative offices, animal kennels and associated maintenance buildings. The facility is presently operated by the Food and Drug Administration (FDA) as a laboratory to conduct biomedical research.

The aim of this study is to assess the site for possible radioactive contamination. Contamination could have resulted from normal or accidental disposal of radionuclides to the surroundings. The first step in this study was to collect soil and water samples from various locations on the site. Sample collection was carried out by a team of drillers and was coordinated by a Project Manager.

All activities were conducted in compliance with all applicable regulatory requirements and quality control in collection, labeling and shipment of the samples. A summary of data obtained along with their approximate geographical sampling location is provided in this section.

2.1 Geography of the Site

The primary structures on the site are the Beltsville Analytical Research Facility (BRF) located northeast of the site and the adjacent Mod I laboratory. The BRF consists of a 71,000 square foot, single-story, brick laboratory/kennel facility, associated trailers and other smaller buildings. This area also has several trailers, a garage and four septic tanks along its southeast boundary. Outside the southeast boundary, there is a sanitary settling tank and a drain pumping station. Adjacent to this is an abandoned septic system distribution box and drain lines leading away from it. The areas along the southwest corner of the BRF appear to have been used as a general refuse area. The Mod I facility consists of four floors with various laboratories and offices. This facility is also licensed to utilize byproduct materials in the same quantities as the BRF.

There are five underground storage tanks (USTs) located on the property storing No. 2 heating oil. Two of them are located in the BRF, three are located at the Mod I facility.

Other locations of interest at the site are the proposed building sites of the Mod II building and the Low-Level Radioactive Waste Storage Building. Both proposed building site locations are in an underdeveloped, heavily wooded portion of the site. The location of these sites and the existing buildings are shown in a schematic form in Figure 2.1(a) and (b).

2.2 General Sampling Procedures

A schematic description of the sampling locations is presented in Figure 2.1(a) and (b). Water and soil samples were collected from the Monitoring Wells (MW) and Soil Borings (SB). Test Pits (TP) were dug near septic tanks and soil samples were collected to check for any possible leakage. Additional Hand Augered (HA) soil borings were performed near the garage in the BRF and in the refuse area along the southwest boundary of the BRF. One surface water sample and one sediment sample were also collected from the outfall of the septic system that is no longer in use. The total number of samples collected from the sources above are:

Monitoring Wells - 13
Soil Borings - 11
Test Pits - 12
Hand Auger - 3
Surface Water - 1
Sediment - 1

Soil excavation and drilling was performed by a qualified team of drillers under the supervision of a project manager. Reporting to the project manager was a Certified Health Physicist (CHP) responsible for the radiological assessment.

FDA - BELTSVILLE RESEARCH FACILITY: LAB ANALYSES FOR SOIL & WATER SAMPLES

(all values in pCi/gm for soil and pCi/L for water)

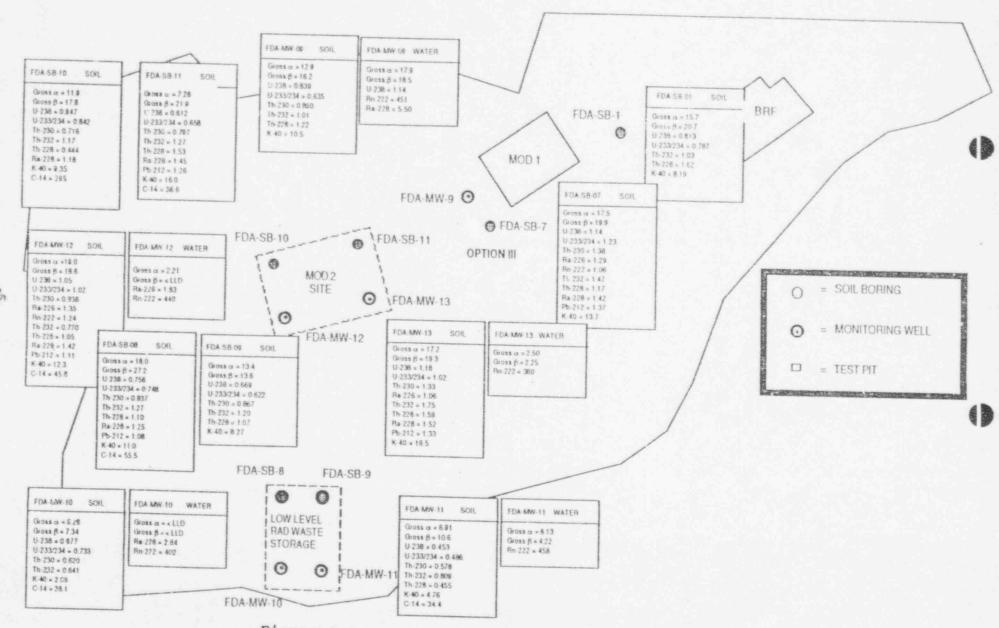


Figure 2.1 a. Approximate Locations of Excavations - The Mod II and the RWS Site.

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The equipment used for excavation was thoroughly cleaned to remove any pre-existing material before taking it into the controlled area. Once in this controlled area the equipment was not taken out of the controlled area until the sampling was complete.

Two different measurements were performed to assess the radioactivity in the samples. First, using field instruments, gross Alpha, Beta and Gamma radiation levels were measured. None of the samples contained sufficient activity to be detected by field instrumentation. The samples were placed in appropriate containers and were shipped to the laboratory.

Detailed analyses were completed by the laboratory. The presence of specific radionuclides and their respective activities were identified.

2.3 Sampling Techniques

Field measurements were completed to identify the radiation levels. The equipment used for measurement along with their characteristics are shown in Table 2.1. The soil and water samples from each excavation were individually screened for radioactivity using these instruments.

Table 2.1						
Instrument Name	Used for Detecting	% Efficiency (Calibration Nuclide)	Serial Number	Last Calibration Date		
Ludium Model 3 Rate Meter With	Alpha	17.2	#93037	04-05-93		
Ludlum Model 63-65 Alpha Scintillation Det.		(Th-230)	 \$089767			
Ludium Model 3 Rate Meter With	Beta Gamma	12.6	#93939	04-05-93		
Ludium Model 44-9 GM Detector		(Tc-99)	#014			
Ludlum µ Meter Model 19	Gamma	Not Applicable (Cs-137)	#91568	04-05-93		

Soil samples were collected from the soil borings. The samples from the soil borings were composites from split spoons at the five to the seven foot depth interval. This depth was chosen in order to test for contamination of the subsurface soil. Approximately 500 grams of soil was collected from the split spoon. Additional soil samples were obtained from test pits and hand augered borings. Test pits adjacent to the septic tanks were dug deep enough to identify any visible signs of leakage. Contamination monitoring was performed for all borings and test pits with particular attention to those adjacent to the septic tanks, in the septic drain field, and in the refuse area. The samples were monitored with a 2mg/cm² Geiger Mueller pancake detector and an Alpha scintillation detector. Hand augered samples were obtained from the UST area and the refuse area.

Water samples were collected from the monitoring wells. Each sample consisted of two (2) one-half gallon plastic containers, one (1) one-half liter poly container, and two (2) approximately 100 ml vials. All samples were monitored for contamination prior to shipping them to the laboratory for analysis.

Additionally, one surface water and one sediment sample were collected to test for the contamination at the outfall. General area monitoring was performed on site in an extensive manner and background radiation levels were documented on representative area maps. A summary of field results is shown in the next section.

Equipment contamination surveys were done by a 100 sq. cm area swipes using an approximate $1\frac{1}{2}$ " cloth smear moistened with glycerin. The smears were washed into scintillation vials using ~ 2 ml distilled water. Scintillation vials were counted by BRF personnel using BRF equipment. These were strictly qualitative samples, intended only to identify the presence of ^{14}C and ^{3}H .

2.4 Summary of Data Obtained

A summary of the data collected from the site is given in Table 2.2. This includes 16 water samples and 41 soil samples taken from the various locations mentioned before. Three of the 29 samples from the monitoring wells were duplicate samples taken in accordance with Quality Control procedures. The number of samples collected from

each location is in accordance with contractual agreements and under the direction of the Project Manager. The exact location for each sample was chosen such that the general characteristics of the site were well represented.

FIELD MEASUREMENTS

		Tab	le 2.2	
	Soil Boring	Sample Obtained	Location	Maximum Area Rad. Levels (µR/hr)
1.	FDA-SB-1	1 Soil	Background (Mod I Gate)	3
2.	FDA-SB-2	1 Soil	Kennel 4 and 6	4
3.	FDA-SB-3	1 Soil	Investigation (Option 1)	
4.	FDA-SB-4	1 Soil		
5.	FDA-SB-5	1 Soil		
6.	FDA-SB-6	1 Soil	Area Adjacent to Electrical to Transformer (Option 2)	2
7.	FDA-SB-7	1 Soil	Area Behind Mod I Boiler Room (Option 3)	2
8.	FDA-SB-8	1 Soil	Low-Level Radwaste	2.5
9.	FDA-SB-9	1 Soil	Storage	
10.	FDA-SB-10	1 Soil	Mod II Building Site	3.5
11.	FDA-SB-11	1 Soil		
M	onitoring Wells	Samples Obtained	Location	
12.	FDA-MW-1	1 Water, 1 Soil	Background	3
13.	FDA-MW-2	1 Water, 1 Soil	Refuse Area	
14.	FDA-MW-3	1 Water, 1 Soil	Septic Drain Field Wells	2.5
15.	FDA-MW-4	1 Water, 1 Soil		
16.	FDA-MW-5	1 Water, 1 Soil	Kennel 4 and 6	4
17.	FDA-MW-6	1 Water, 1 Soil	Investigation (Option 1)	H The L
18.	FDA-MW-7	1 Water, 1 Soil	UST at BRF	2.5

	TOTAL STREET, AND A STREET,	Tab	le 2.2	
19.	FDA-MW-8	1 Water, 1 Soil	Area Adjacent to Electrical Transformer (Option 2)	2.5
20.	FDA-MW-9	1 Water, 1 Soil	Area Behind Mod I Boiler Room (Option 3)	2
21.	FDA-MW-10	1 Water, 1 Soil	Low-Level Radwaste	2.5
22.	FDA-MW-11	1 Water, 1 Soil		
23.	FDA-MW-1	1 Water, 1 Soil	Mod II Building Site	3.5
24.	FDA-MW	1 Water, 1 Soil		
25.	FDA-MW-14	1 Soil	QC Duplicate of MW-	
26.	FDA-MW-14	1 Water	QC Duplicate of MW-	
27.	FDA-MW-30	1 Wa	QC Duplicate of MW-3	
	Test Pits	Sample Obtained	Location	
28.	FDA-TP-1	1 Soil	Septic	2
29.	FDA-TP-2	1 Soil	System Test Pits	
30.	FDA-TP-3	1 Soil		
31.	FDA-TP-4	1 S		
32.	FDA-TP-5	1 Soil	Septic	2.5
33.	FDA-TP-6	1 Soil	Drain Field	
34.	FDA-TP-7	1 Soil (Not Analyzed)	Test Pits	
35.	FDA-TP-8	1 Soil		
36.	FDA-TP-9	1 Soil	Refuse Area	2
37.	FDA-TP-10	1 Soil		
38.	FDA-TP-11	1 Soil		
39.	FDA-TP-12	1 Soil		
10.	FDA-TP-13	1 Soil	Septic Drain Field	2.5

		Tabl	e 2.2	
1	Samples	Sample Obtained	Location	
41.	FDA-UST-HA-	1 Soil (Not Analyzed)	UST at BRF	2.5
42.	FDA-UST-HA- 2	1 Soil		
43.	FDA-UST-HA-	1 Soil (Not Analyzed)		
44.	FDA-RA-HA-4	1 Soil	Refuse Area	2
45.	FDA-RA-HA-5	1 Soil		
	Outfall Data			
46.	FDA-SW-1	1 Water	Outfall Area	2.5
47.	FDA-SED-1	1 Soil		

General area gamma radiation monitoring indicated no unusual radiation levels at any location. The maximum value recorded was $4\mu R/hr$ along the western boundary of the BRF. This value is well within acceptable limits for background radiation (Ref. 2).

Contamination monitoring performed for all borings and test pits did not identify any contaminated soil at all locations. Also, no contamination was detected from the area swipes for the site equipment or the sample shipments.

3.0 ANALYTICAL RESULTS

3.1 Shipment and Analysis Process

The samples collected from the site were individually sealed and marked for easy identification. The soil samples were sealed in glass jars and isolated using ziplock bags. They were shipped in a strong tight container. The water samples were distributed in half gallon, half liter and 100 ml containers. They were then stored in a cooler that was filled with vermiculite and then taped thoroughly for leak tightness. The samples were shipped out by Federal Express mail in batches. A chain of custody form was included in each shipment. The complete set of the chain of custody forms was later returned to Pacific Nuclear along with the sample analysis results. Copies of these forms are attached in Appendix B. The coolers and the airmail boxes were surveyed for contamination before mailing. The packages were internally marked using the Limited Quantity Radioactive Shipment Record form to conform with conditions and limitations of 49CFR173.421 for excepted radioactive material. An outgoing shipment record log was also maintained by the site CHP and this is included in Appendix C.

At the laboratory, the samples were analyzed using internally established Standard Operating Procedures (SOPs). These procedures provide necessary instructions to conduct the analysis for gross value determination as well as detailed analysis of radionuclides in soil and water. The apparatus and reagents used, quality control procedures and calculations for activity, uncertainty and the Lower Limit of Detection for each analysis are also given in the SOPs. An uncontrolled copy of the SOPs are attached in Attachment I for reference. The samples were first analyzed for gross alpha, non-volatile beta and gamma activity. The samples were analyzed in detail to identify the radionuclides and their activity if the sample indicated levels above the LLD for gross alpha, non-volatile beta and gamma.

The Lower Limit of Detection (LLD) is a minimum activity which can be reliably detected at a specified statistical confidence level by a particular counting instrument. The LLD is a function of counting intervals, background, efficiencies and other related factors.

XGR-001-002

3.2 Natural Radiation Levels

The average concentration levels for naturally occurring radionuclides in soil and water were obtained from several sources. The Th-232 and U-238 decay chains represent the main primordial nuclide chains that account for a number of nuclides identified in this study. The Thorium-232 chain has, besides other intermediate nuclides, Th-228, Ra-228 and Pb-212 in its decay series. Similarly, the Uranium-238 chain has in its decay series, U-234, Th-230, Ra-226 and Rn-222 among other nuclides. A schematic diagram of the Uranium and Thorium primordial decay chains are shown in Fig. 3.1 and 3.2 respectively for reference. Under ideal conditions a state of secular equilibrium should be achieved, wherein all daughter activities are equal to the activity of the parent. This equilibrium condition does not generally occur, since daughter half lives are sufficiently long to permit chemical and geophysical processes to act on their concentrations. There is also substantial geographical variation in radionuclide concentration and activity across the continental United States. Based on the lithography of the site location, an activity estimate for the nuclides at the head of the decay chains were obtained from Ref. 1 and 2. The average concentrations for the daughter nuclides of the chains were estimated based on discussions presented in Ref. 1. An equilibrium activity level is assumed for natural concentrations not identified in references. The naturally occurring concentrations of K-40 that is a common independently occurring radionuclide was also obtained from Refs. 1 and 2. An estimate for specific activity of Carbon-14 is 6 pCi per gram of surface Carbon [Ref. 2]. Tritium levels were obtained from Ref. 3. These levels are estimated to be less than or equal to 60 pCi/L for surface streams. The naturally occurring Radium 226 and Radium 228 concentrations were obtained from Ref. 4. Several references were reviewed for Uranium and Thorium concentrations in ground water.

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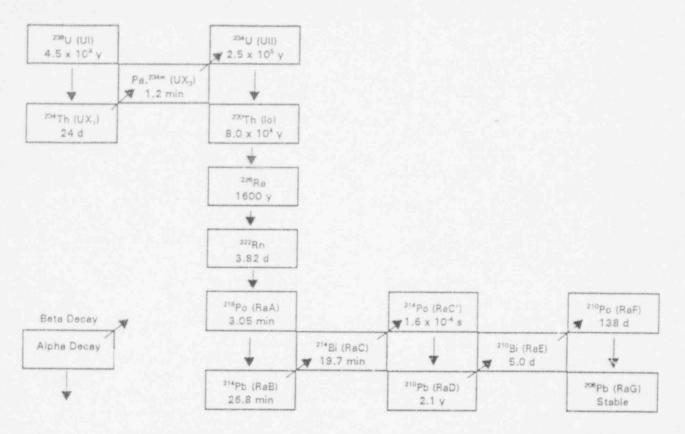


Fig. 3.1 Primordial Nuclides Decay Chain - Uranium Series

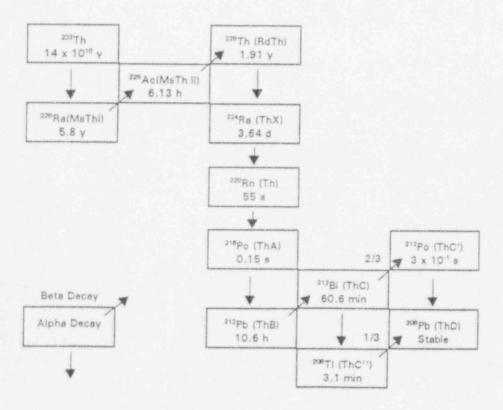


Fig. 3.2 Primordial Nuclides Decay Chain - Thorium Series

3.3 LLDs and Estimated Naturally Occurring Levels

The radionuclides that were investigated for in the samples and their respective LLDs and the available background levels for soil and water samples are given below.

		TABLE 3.1					
Radionuclide		Vater pCi/L)	Soil (pCi/g)				
	LLD	Naturally Occurring Level	LLD	Naturally Occurring Level			
Gross Alpha	2.00		5.00	一 连线			
Non-Volatile Beta	2.00		5.00				
Gamma PHA							
Lead-212	15.0		1.00	0.7			
Potassium-40	110		1.00	8-20			
Cesium-137			0.100				
Isotopes							
Uranium-238	1.00	0.7	0.200	0.7			
Uranium-235	1.00		0.500				
Uranium-234	1.00	0.4	0.200	0.7			
Thorium-232	1.00		0.200	0.7			
Thorium-230	1.00		0.200	0.7			
Thorium-228	1.00		0.200	0.7			
Radium-228	1.00	0-18	1.00	0.7			
Radium-226	1.00	0-26	1.00	1.0			
Radon-222	200	10 ² - 10 ³	1,00	1.0			
Carbon-14	200		20.0	6.0*			
Tritium	700	60					

3.4 Analysis Results

The laboratory data is fairly extensive and includes results from the gross analysis and the concentrations of the individual radionuclides. The samples from the Background, the Low-Level Radwaste site, the Mod II site and the Option areas were submitted for full analysis. The remaining samples, Outfall, Refuse Area, Septic System area and the UST area required only screening tests. The laboratory has conducted a full spectrum analysis for all samples that were submitted with such requests. For the samples submitted for screening, the gross analysis was first conducted. If the results were above the LLD activity for the alpha or beta analysis, a complete isotopic analysis was conducted. These results are tabulated in a spreadsheet and are presented in Tables 3.2(a) and 3.2(b). Table 3.2(a) gives the data for the monitoring well samples, both soil and water, and for the single surface water sample. Table 3.2(b) gives the results from all the remaining soil samples that were obtained from soil borings, test pits, hand augered samples and the sediment sample. In both tables, only the values that are above the LLDs are shown. Blank spaces indicate the levels were below LLDs. The entry 'NA' indicates that this nuclide was not tested for, since the screening test resulted in a negligible amount of alpha or beta activity. Table 3.3 presents the same data classified according to the sample locations.

For each sample entry, the gross alpha and non-volatile beta measurements are shown. This is followed by the results of the detailed analysis. Uranium-235 and Tritium are not included since no sample indicated any activity above the LLD value for these nuclides. The order in which the nuclides are presented reflects the decay series that they belong to. The nuclides in the first six columns under the heading 'Isotopes', from U-238 through Rn-222, belong to the Uranium series. The next four, Th-232 through Pb-212 belong to the Thorium series. Pb-212 is a gamma emitter, and shows up in the gamma spectrum analysis. It is classified under the gamma-Peak Height Analysis (gamma-PHA) measured elements. The other gamma emitters are Potassium-40 and Cesium-137. Carbon-14 is a cosmogenic and a weapons fallout isotope that is independent of the decay chains and is classified under a separate column.

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3.5 General Observations

The gross alpha and non-volatile beta are of relatively the same magnitude for all the samples that indicated values above the LLD. None of the samples have any levels significantly above the LLD.

The Uranium chain shows fair consistency in the concentrations of the constituent radionuclides, Uranium-238, Uranium-234 and Thorium-230. Radium-226 and Radon-222, although belonging to the same decay chain, seem to occur independently in many locations. Considering the fact that the concentration is a transient parameter subject to nuclide migration and other external effects there is a good agreement in levels among these nuclides. Further, the concentrations are also nearly of the same magnitude, approximately equal to estimated naturally occurring levels.

The Thorium chain nuclides are also present in nearly equal concentrations. Lead-212, one of the latter elements of the chain is not evident in as many locations as the parent nuclides. This can be attributed to the transient phenomena associated with the decay. The average concentrations are all at nearly naturally occurring levels.

All other nuclides that were identified are approximately at naturally occurring levels. In the next section each of the sample analysis results obtained from the laboratory is assessed on a location by location basis. The impact of these measurements on future use of the location is analyzed and recommendations are provided if required.

TABLE 3.2a	1			SUMMAP		
				{Units: so	oil - pCi/g	g; water -
			Gross	Non-Vol.		
			Alpha	Beta	U-238	U-233/2
LLD		Water	2.00	2.00	1.00	1.00
Natural	Levels	Water			0.70	0.40
LLD		Soil	5.00	5.00	0.200	0.200
Natural	Levels	Soil			0.700	0.700
Sample-ID	Туре	Location				0.212
MW-1	Soil	Background			0.050	4
MW-2	Soil	Refuse Area	12.1	11.9	0.656	0.829
MW-3	Soil	Septic Sys.			NA	NA
MW-4	Soil	Septic Sys.	5.23	5.80	0.446	0.488
MW-5	Soil	Option 1			0.229	0.25
MW-6	Soil	Option 1		7.82	0.280	0.32
MW-7	Soil	UST Area	5.80	7.63	0.421	0.36
MW-8	Soil	Option 2	5.65			0.31
MW-9	Soil	Option 3	12.9	16.2	0.839	0.63
MW-10	Soil	LLRWS Site	6.28	7.34	0.677	0.73
MW-11	Soil	LLRWS Site	6.91	10.6	0.453	
MW-12	Soil	Mod 2 Site	19.0	18.6	1.05	1.02
MW-13	Soil	Mod 2 Site	17.2	19.3	1.18	1.02
MW-14	Soil	Mod 2 Site	10.6	21.1	1.10	1.09
MW-1	Water	Background	12.9	10.9		
MW-2	Water	Refuse Area	4.35	5.43		
MW-3	Water	Septic Sys.	2.65	4.53	NA	NA
MW-4	Water	Septic Sys.	2.75	5,56		
MW-5	Water	Option 1	4.93	5.07		
MW-6	Water	Option 1	8.77	8.20		
MW-7	Water	UST Area	9.79	11.0	3400	
MW-8	Water	Option 2	4.18	5.84	and the state of	
MW-9	Water		17.9	18.5	1.14	
MW-10	Water	The second second		age Lacinos Sectionalistica		
MW-11	Water	I commence and the	6.13	4.22		
MW-12	Water	The second second	2.21	on opine policy		
MW-13	Water	The second second	2.50	2.25		
MW-14	Water	The second			4	
MW-30	Water	Septic Sys.	3.09	THE RESERVE AND ADDRESS OF THE PARTY OF THE	NA	NA
SW-1	Wate	Outfall		17.1		

Note1 Note2 Denotes levels measured
NA Not Analyzed

RESULTS OBTAINED F ROM THE BELTSVILLE SITE

pÇi/L; e	cept whe	re indica	ted othe	rwise}		Na			
	Isotope	S					Gamma	and the second s	
4 Th-23	0 Ra-226	Rn-222	Th-232	Th-228	Ra-228	Pb-212	K-40	Cs-137	and the supplement of the latest transfer of
1.00	1.00	200	1.00	1.00	1.00	15.0	110	10.0	200
	10.0	400			10.0				8E+05
0.200	1.00	1.00	0.200	0.200	1.00	1.00	1.00	0.100	20.0
0.700	1.00	1.00	0.700	0.700	0.70		10.0	0.000	
0.24	5		0.235						
1.08			1.44	1.37		1.03	7.20		
NA	NA		NA	NA	NA				
			0.471				1.81		
0.27	9		0.379	0.244					
			0.359	0.436			2.35		
0.37	3		0.596	0.492			2.17		96.9
			0.262						
0.89	0		1.01	1.22			10.5		
0.62	0		0.641				2.06		38.1
0.57	3		0.809	0.455			4.76		34.4
0.93	1,35	1.24	0.770	1.05	1.42	1.11	12.3		45.8
1.33	1.06		1.75	1.59	1.52	1.33	16.5		
0.75	3 1.10		0,909	1.15	1.44	1.29	15.7		
	2.92	341			1.60			100000	
	2.67				1.50				
NA	NA		NA	NA	NA				
	1.31	204							
					1.60			1000000	27.0
	2.99				1.30				
7 72		335	13		2.20		E ME	1.72	
					1.60		第3 x 2 x 2 x 3 x 5 x 5 x 5 x 5 x 5 x 5 x 5 x 5 x 5		
0 100-	In the second case	451	* 200	-	5.50				
	2.84	402							
4 2000		458	rek.		1				
	1.83	440							
	****	380							
		295							
NA	NA		NA	NA	NA				
		500000				3	-		

ANSTEC APERTURE CARD-

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are below LLD

Rev: Jun 10 825

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TABLE 3.2b)			SUMMARY
			Gross	Non-Vol.
			Alpha	Beta
LLD		Soil	5.00	5.00
Natural	Levels	Soil		
and the second second				
Sample-ID	Type	Location		
HA-2	Soil	UST Area	Anguerrott Contraction or	6.44
HA-4	Soil	Refuse Area	9.75	10.1
HA-5	Soil	Refuse Area	12.6	8.86
SB-1	Soil	Background	15.7	20.7
SB-2	Soil	Option 1	13.5	14.7
SB-3	Soil	Option 1	8.40	10.4
SB-4	Soil	Option 1	6.95	6.74
SB-5	Soil	Option 1		
SB-6	Soil	Option 2		
SB-7	Soil	Option 3	17.5	19.9
SB-8	Soil	LLRWS Site	18.0	27.2
SB-9	Soil	LLRWS Site	13.4	13.6
SB-10	Soil	Mod 2 Site	11.9	17.8
SB-11	Soil	Mod 2 Site	7.26	21.9
SED-1	Soil	Outfall		100000
TP-1	Soil	Septic Sys.	11.9	15.0
TP-2	Soil	Septic Sys.	7.66	9.21
TP-3	Soil	Septic Sys.	9.46	14.8
TP-4	Soil	Septic Sys.	18.2	13.6
TP-5	Soil	Septic Sys.	7.12	6.46
TP-6	Soil	Septic Sys.	9.21	6.76
TP-8	Soil	Septic Sys.		
TP-9	Soil	Refuse Area	6.99	5.61
TP-10	Soil	Refuse Area	7.69	14.2
TP-11	Soil	Refuse Area	7.89	10.6
TP-12	Soil	Refuse Area	3	
TP-13	Soil	Septic Sys.	5.30	

Note1 Note2 Note3 Samples TP-7, HA

Denotes

NA Not Analy

						AND DESCRIPTION OF THE PERSON NAMED IN	A CONTRACTOR OF THE PARTY	C-Contraction of the last of t			
OF AN	NALYTICAL			INEDF	HT MOF	EBELTS	VILLE S	ITE			
		{Units -	discourage and the same and	-	***				Gamma	-PHA	
Mark Mark State of the		TI 000	Isotopes	and the state of t	TL 000	Th-228	Ra-228		K-40	Cs-137	C-14
-238	U-233/234	ALTERNATION OF THE OWNER, WHEN THE PARTY	Ra-226	Carlotti China Carlotti Carlot	Th-232	- CARLES AND THE PARTY OF THE P	1.00	1.00	1.00	0.100	20.0
200	0.200	0.200	1.00	1.00	0.200	0.200	0.70	1,00	10.0	0.000	
700	0.700	0.700	1.00	1.00	0.700	0.700	0.70				
.472	0.433	0.275			0.496				1.86		31.8
.645	0.578	0.449			0.606	1.38			4.73	0.132	
.707	0.549	0.679	\$ 100 A 100 A		0.839	0.794			6.64		
.813	0.787	0.070	Accept these		1.03	1.62			8.19		
.693	0.634	0.868			1.06	1.23	1.43	1.06	6.23		
1.525	0.483	0.322			1.03	0.807			3,65		
1.323	0.318	0.334		20.50	0.429			-	1.28		
).319	0.510	0.862			0.702	0.613					
).256	0.010	0.284			***************************************				1.03		
1.14	1.23	1.38	1.29	1.06	1.47	1.17	1.42	1,37	13.7		
).756	0.748	0.937		a variation of a	1.27	1.10	1,25	1.08	11.0		55.5
0.669	0.622	0.867	1000		1.20		1.07		8.27		
0.947	0.842	0.716			1.17	0.444	1.18		9.35		295
0.612	0.658	0.797			1.27	1.53	1.45	1.26	16.0		36.6
NA	NA	NA	NA		NA	NA	NA		2.19	0.150	
0.898	-	0.981			1.02	0.772			6.08		
0.690	4	0.516			0.828	0.830			4.21		
0.402		0.631			0.710				6.43		
0.698		0.00			0.857				1.13		
0.636		1.82			0.447	0.477			1.37		
		0.972	,		0.479				2.03		1
0.936	NA NA	NA	NA	100	NA	NA	NA				1
NA		0.501	\$1000000000000000000000000000000000000		0.403	0.635	5	2 7 7 7 7	1.25		83.9
0.416		0.001			0.425	A second second	100000000000000000000000000000000000000		4.75		
0.513				7	0.608	CONCORDED OUTCOMENS			5.32		
0.606	NA	NA	NA		NA	NA			1.46		
NA 0.274		0.350	\$10,000,000,000,000,000		0.401						46.4

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1 and HA-3 were not sent for analysis. evels measured are below LLD zed ANSTEC APERTURE CARD

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TABLE 3.3						VALYTICAL						SVILLE S	ITE			
				{Units: so	oil - pCi/	g; water - po	Ci/L; exc	ept wher	re indica	ted other	wise}					
			Gross	Non-Vol.				Isotope						Gamma	A STATE OF THE PARTY OF THE PAR	
			Alpha	Beta	U-238	U-233/234	Th-230	Ra-226	Rn-222	Th-232	Th-228	Fla-228	-	K-40	Cs-137	C-14
LLD		Water	2.00	2.00	1.00	1.00	1.00	1.00	200	1.00	1.00	1.00	15.0	110	10.0	200
Natural	Levels	Water			0.70	0.40		10.0	400			10.0				8E+0
LLD		Soil	5.00	5.00	0.200	0.200	0.200	1.00	1.00	0.200	0.200	1.00	1.00	1.00	0.100	20.0
Natural	Levels	Soil			0.700	0.700	0.700	1.00	1.00	0.700	0.700	0.70		10.0	0.000	
Sample-ID	Type	Location														
SB-1	Soil	Background	15.7	20.7	0.813	0.787				1.03	1.62			8.19		
MW-1	Soil	Background	Contraction of the Contraction o		19313	0.212	0.245			0.235	13.07.0				18913	
MW-1	Water	Background	CONTRACTOR OF STREET	10.9				2.92	341	A .		1.60				
MW-10	Soil	LLP.WS Site	6.28	7.34	0.677	0.733	0.620			0.641		438.80		2.06		38.
MW-10	Water	LLRWS Site						2.84	402				100			
MW-14	Water	LLRWS Site							295	that .						4
MW-11	Soil	LLRWS Site	6.91	10.6	0.453	0.486	0.578			0.809	0.455			4.76		34.4
MW-11	Water	LLRWS Site	6.13	4.22					458							
SB-8	Soil	LLRWS Site	18.0	27.2	0.756	0.748	0.937	1000		1.27	1.10	1.25	1.08	11.0		55.5
SB-9	Soil	LLRWS Site	13.4	13.6	0.669	0.622	0.867			1.20		1.07		8.27		
MW-12	Soil	Mod 2 Site	19.0	18.6	1.05	1.02	0.938	1.35	1.24	0.770	1.05	1.42	1.11	12.3		45.8
MW-12	Water	Mod 2 Site	2.21					1.83	440							
MW-13	Soil	Mod 2 Site	17.2	19.3	1.18	1.02	1.33	1.06		1.75	1.59	1.52	1.33	16.5		
MW-13	Water	Mod 2 Site	2.50	2.25	5.15				380							
MW-14	Soil	Mod 2 Site	10.6	21.1	1.10	1.09	0.753	1.10		0.909	1.15	1.44	1.29	15.7		
3B-10	Soil	Mod 2 Site	11.9	17.8	0.947	0.842	0.716			1.17	0.444	1.18		9.35	7000	295
SB-11	Soil	Mod 2 Site	7.26	21.9	0.612	0.658	0.797			1.27	1.53	1.45	1.26	16.0		36.0
MW-5	Soil	Option 1			0.229	0.256	0.279			0.379	0.244	16-16-2				
MW-5	Water	Option 1	4.93	5.07	52 3			27.5	1000	1.5		1.60	1000		(April)	
MW-6	Soil	Option 1		7.82	0.280	0.325		<u>, </u>	Company	0.359	0.436			2.35	41.5 most	REE.
MW-6	Water	Option 1	8.77	8,20				2.99				1.30		5 82		1.25/16 27

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or other party of	2	
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T	SB-2	Soil	Option 1	13.5	14.7	0.693	0.634	0.868			1.06	1.23	1.43	1.06	6.23		
-	SB-3	Soil	Option 1	8.40	10.4	0.525	0.483	0.322			1.03	0.807			3.65		
1	SB-4	Soil	Option 1	6.95	6.74	0.232	0.318	0.334			0.429				1.28		
1	SB-5	Soil	Option 1	75.37		0.319	0.510	0.862			0.702	0.613				1	
-	MW-8	Soil	Option 2	5.65			0.319				0.262						
1	MW-8	Water	Option 2	4.18	5.84								1.60				
	SB-6	Soil	Option 2	4015		0.256		0.284					11.79		1.03		
T	MW-9	Soil	Option 3	12.9	16.2	0.839	0.635	0.890			1.01	1.22		100,00	10.5		
	MW-9	Water	Option 3	17.9	18.5	1.14				451			5.50				1000
	SB-7	Soil	Option 3	17.5	19.9	1.14	1.23	1.38	1.29	1.06	1.47	1.17	1.42	1.37	13.7		
-	SED-1	Soil	Outfall	100		NA	NA	NA	NA	4,15	NA	NA	NA		2.19	0.150	
diam'r.	SW-1	Water	Outfali		17.1	401		100	N Maria								
1	HA-4	Soil	Refuse Area	9.75	10.1	0.645	0.578	0.449			0.606	1.38	1000		4.73	0.132	
	HA-5	Soil	Refuse Area	12.6	8.86	0.707	0.549	0.679			0.839	0.794			6.64		
1	MW-2	Soil	Refuse Area	12.1	11.9	0.656	0.829	1.08			1.44	1.37	F. Last	1.03	7.20		44
-	MW-2	Water	Refuse Area	4.35	5.43				2.67				1.50				97
1	TP-10	Soil	Refuse Area	7.69	14.2	0.513	0.564				0.425	0.782	- 3 (5)		4.75		
	TP-11	Soil	Refuse Area	7.89	10.6	0.606	0.524				0.608				5.32		
-	TP-12	Soil	Refuse Area			NA	NA.	NA	NA		NA	NA	NA	1	1.46		
-	TP-9	Soil	Refuse Area	6.99	5.61	0.416	0.345	0.501			0.403	0.635			1.25		83.9
	E-WM	Soil	Septic Sys.		785	NA	NA	NA	NA		NA	NA	NA	1 192		The second	
	MW-3	Water	Septic Sys.	2.65	4.53	NA	NA	NA	NA	55.6	NA	NA	NA				10000
	MW-30	Water	Septic Sys.	3.09	4.07	NA	NA	NA	NA		NA	NA	NA				
M	MW-4	Soil	Septic Sys.	5.23	5.80	0.446	0.488			107.55	0.471				1.81		
	MW-4	Water	Septic Sys.	2.75	5.56				1.31	204			THE RESERVE			[景]	
	TP-1	Soil	Septic Sys.	11.9	15.0	0.898	0.925	0.981			1.02	0.772	3 625	33.23	6.08		
•	TP-13	Soil	Septic Sys.	5.30		0.274	0.456	0.350			0.401	TO SE	413.50	Test.		1 To	46.4
-	TP-2	Soil	Septic Sys.	7.66	9.21	0.482	0.508	0.516			0.828	0.830		111 12	4.21		
-	TP-3	Soil	Septic Sys.	9.46	14.8	0.711	0.700	0.631			0.710				6.43		
1	TP-4	Soil	Septic Sys.	18.2	13.6	0.698	0.669	ASSESSED.			0.857			THE STATE OF	1.13		
1	TP-5	Soil	Septic Sys.	7.12	6.46	0.636	0.581	1.82			0.447	0.477		2.3	1.37		1 (1) (1) (1) (1) (1) (1) (1) (1) (1) (1
the same	TP-6	Soil	Septic Sys.	9.21	6.76	0.936	0.890	0.972	San Lan	A. (2) (8) (1)	0.479				2.03		
-	TP-8	Soil	Septic Sys.			NA	NA	NA	NA	10.04	NA	NA	NA				
	HA-2	Soil	UST Area		6.44	0.472	0.433	0.275			0.496				1.86		31.8
-	MW-7	Soil	UST Area	5.80	7.63	0.421	0.363	0.373			0.596	0.492			2.17	B.C.	96.9
-	MW-7	Water	UST Area	9.79	11.0					335			2.20				

Note1 Note2

Note3

Samples TP-7, HA-1 and HA-3 were not sent for analysis.

Denotes levels measured are below LLD

NA Not Analyzed

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4.0 SAMPLE ANALYSIS RESULTS

A summary of the sample analysis was provided in the last section and is tabulated under Table 3.3. In this section a complete assessment of the activity levels observed on a location by location basis is conducted. The order of assessment follows the same order as that presented in Table 3.3.

For each group of samples, the location, nature of the samples collected and the type of analysis performed is described. The expected contamination based on past usage of the location is mentioned where appropriate. This is followed by a assessment of the data obtained from different samples for that location. The concentration of the radionuclides are compared with their expected levels for natural occurrence. If the levels are in the order of magnitude of the naturally occurring levels, they are considered to be within acceptable limits. Further, the concentrations of nuclides belonging to the same chain are verified to see if they reflect steady state concentrations. This adds theoretical support to the analysis and helps to identify any anomalies. Any sample result that shows markedly above natural level values is identified and discussed in detail.

4.1 Background Measurements

Field Location and Description:

These samples were taken to obtain baseline readings from random locations expected to be unaffected by past operations. One monitoring well, MW-1, was advanced in the North-West side of the parking lot which is adjacent to the BRF administration building. A split spoon soil sample and a water sample was collected. An additional soil boring, SB-1, was advanced in the area near the Mod I building gate and a split spoon soil sample was obtained. The samples were analyzed for gross alpha, beta and gamma activity and this was followed by a complete isotopic analysis including analysis for Carbon-14 and Tritium.

XGR-001-002

Analysis Results:

The soil sample from SB-1 indicates the presence of alpha and beta emitters in the gross analysis. Readings of the same order of magnitude for these emissions are seen from the water sample in MW-1.

Detailed analysis of the samples reveals the presence of various decay chain elements. These chain elements, if present, are of nearly the same concentrations as their parent nuclides. The levels are at or below estimated natural levels for these nuclides.

The tritium and Carbon-14 values were found to be below their respective LLDs.

The MW-1 water sample shows the presence of Radon-222 reflecting the nuclides tendency to remain in a dissolved form [Ref. 2].

Overall the concentrations are in the order of naturally occurring levels.

No recommendations are made for these locations.

4.2 The Low-Level Radwaste Storage Site

Field Location and Description:

This site is located along the southern boundary of the FDA property. This area is the proposed site to locate the Low-Level Radwaste storage building. Two monitoring wells and two soil borings were advanced in this site. The approximate locations of these advancements are shown in Fig. 2.1(a). A ground water and a split spoon sample was collected from each monitoring well and a split spoon sample was collected from each of the soil borings. The samples were subjected to gross and isotopic analysis.

A duplicate water sample was obtained from the monitoring well, MW-10 and was marked MW-14, water. This was done in accordance with procedures for quality assurance of the laboratory analysis process.

Analysis Results:

The gross analysis indicated the presence of alpha and beta emitters in all but one water sample. The samples obtained from the soil borings indicate higher levels of alpha and beta activity than the samples from the monitoring wells.

The detailed analyses indicate the presence of various primordial decay nuclides. For each sample, the concentrations of the daughter nuclides of a chain are seen to be nearly the same as that of the nuclide that heads the chain, indicating that a steady state exists in the decay process. In a few soil measurements the Uranium series is fully represented except for Radium-226 and Radon-222, as in samples MW-10, SB-8 and SB-9. In each of these cases it may be noticed that the expected steady state concentrations of Radium-226 and Radon-222 are below 1 pCi/g, thus below the LLD selected for these nuclides. Accordingly, when all levels are above the LLD value, a complete set of the decay chain nuclides is seen, as in the Thorium series for SB-8. The overall concentration levels for the different primordial nuclides are in the order of magnitude of the estimated levels for natural activity.

The maximum Carbon-14 concentration for this site is 55.5 pCi/g observed in the soil sample from SB-8. This does not pose a radiological health problem.

Potassium-40 was also observed in varying concentrations in the samples, all in the order of magnitude of naturally occurring levels.

The duplicate water sample, MW-14, shows nearly the same levels as the original water sample.

No recommendations are made for this location.

4.3 The Mod II Building Site

Field Location and Description:

The Mod II building site is located due north of the Low-Level Radwaste Site and southwest of the Mod I site. Two monitoring wells and two soil borings were installed at this site. A ground water sample and a split spoon sample was collected from each monitoring well and a split spoon sample was collected from each soil boring. The sample locations are approximately shown in Fig. 2.1(a). The samples were analyzed for gross activity and followed with a detailed analysis.

A duplicate of a split spoon sample was obtained from one of the monitoring wells in accordance with procedures for performing quality control on the analysis process. This was obtained from the monitoring well MW-13 and the sample was marked as MW-14, soil.

Analysis Results:

The gross analysis shows the presence of alpha and beta emitters. Again as in the Low-Level Radwaste site, the soil samples show higher alpha and beta values than the water samples. This is probably due to the selective solubility of some of the nuclides.

The levels of primordial nuclides present in the different samples may be justified in a similar manner as discussed for the LLRWS site. The concentrations of the daughter nuclides of a series closely follows the concentration of the nuclide that heads the series. The readings show a high level of consistency in this behavior within statistical variations expected for such an analysis. Again Radon-222 is seen to occur more in water samples than in soil samples due to its tendency to remain in a dissolved state. All these measurements are still well within the levels expected for naturally occurring radionuclides.

A significant measurement for Carbon-14 was observed in one of the samples. The soil sample from SB-10 was found to contain 295 pCi/g of Carbon-14. This sample was reanalyzed by the laboratory and the second analysis resulted in 200 pCi/g. Since

no experimental activity was undertaken at this location to explain the presence of Carbon-14, it is assumed that the measurement is not related to the activities of the research facility. Carbon-14 is commonly present in coal byproducts that are natural effluent from industrial processes. On the site itself there were melted ore samples which read up to 50 cpm with a pancake detector. These ore samples have been traced to iron ore extraction activities that were conducted in the past.

The duplicate soil sample obtained for MW-13 is recorded as the MW-14 soil sample. The duplicate sample indicates a high degree of agreement with the first sample.

No recommendations are made for this location.

4.4 Option 1 Area - Kennels

Field Location and Description:

The kennels are located in the BRF complex. The open area adjacent to the kennels is an option for locating the Low-Level Radwaste Site. Two monitoring wells and four soil borings were advanced in this area. The approximate locations of each of these advancements in shown in Figure 2.1(b). A split spoon sample and a ground water sample was collected from each of the monitoring well, and a soil sample was collected from each soil boring. A complete analysis was performed for all the samples.

Analysis Results:

Soil and Water analysis results from the monitoring wells, MW-5 and MW-6 indicated either below LLD or barely above LLD measurements for most of the samples.

For the remaining samples from the soil borings, the results indicate concentrations within naturally occurring levels for all the nuclides. The nuclides from the Uranium and Thorium series are consistently present. The Radium and Radon levels are below their respective LLDs. Potassium-40 levels present are within naturally occurring levels.

Tritium, Carbon-14 and Cesium-137 levels were below their respective LLDs.

No recommendation is made for this location.

4.5 Option 2 Area - Transformer Pad

Field Location and Description:

This site is located due south-east of the BRF parking lot. This area is the second option to locate the Low-Level Radwaste Site. One monitoring well and one soil boring was installed in this site. A split spoon sample and a ground water sample was collected from the monitoring well and a split spoon sample was collected from the soil boring. A full analysis was completed on all these samples.

Analysis Results:

The gross analysis indicates levels slightly above the LLD for the alpha and beta emitters for the monitoring well samples. Traces of Uranium and Thorium are seen in the soil sample from the monitoring well. A small concentration of Radium-228 is observed in the monitoring well water sample. Similar readings are seen from the soil sample at SB-6. A slight amount above LLD is observed for Potassium-40. No Carbon-14 or Tritium were found in these samples.

No recommendation is made for this location.

4.6 Option 3 Area - Site Adjacent to Mod I building

Field Location and Description:

This site is located adjacent to the Mod I building towards the southwest direction. This is the third available option for locating the Low-Level Radwaste Storage Site. One monitoring well and one soil boring was installed at this location. One split spoon and one ground water sample was collected from the monitoring well and one soil

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sample was collected from the soil boring. The samples were submitted for complete analysis.

Analysis Results:

All the samples indicated nearly the same above LLD values for both the gross alpha analysis and for the non-volatile beta analysis. The soil sample from MW-9 indicated the presence of the first three nuclides in the Uranium decay chain all at nearly the same activity. The water sample indicated a relatively high level of Radium-228, 5.5 pCi/L, which is about four times the levels generally seen for other locations. This level is still within acceptable naturally occurring amounts for this nuclide.

The sample from the soil boring, SB-7 contained only naturally occurring radionuclides. The Uranium chain was fully represented and the concentrations of all the daughter nuclides were nearly at the same activity as that of Uranium-238. The Thorium decay chain indicated similar consistency in all its daughter nuclides.

Potassium-40 levels were found to be in the order of magnitude for naturally occurring levels for both soil samples. No other gamma emitters were identified. No Tritium or Carbon-14 was detected in any of the samples.

No recommendation is made for this location.

4.7 Outfall Area

Field Location and Description:

The outfall area is located due south of the septic drain field in a wooded location. This area was the drain for the waste water from the septic drain field when it was in use. To assess the presence of any contamination, one sediment (surface soil) and one water sample was collected from the outfall area. These samples were subjected to initial screening and on positive activity a complete analysis was conducted.

Analysis Results:

The soil sample indicated only traces of gamma activity. Besides a small concentration of Potassium-40, this sample indicated minute traces of Cs-137 in the analysis possibly from an atmospheric fallout. No Carbon-14 or Tritium concentrations above the respective LLDs were observed.

No recommendation is made for this location.

4.8 Refuse Area

Field Location and Description:

The refuse area is located due west of the BRF, behind the trailers. This location has been used in the past to dump debris from the facility. Building material, waste sheet metal, piping and old machinery were unearthed from the test pits that were dug at this location. Four test pits were dug and soil samples were collected. An additional monitoring well was advanced and a split spoon sample and a ground water sample were collected from this location. Two more hand augered soil samples were collected from the vicinity of the test pits.

All the samples were subjected to screening tests. On positive identification in the gross analysis, a detailed isotopic analysis was conducted.

Analysis Results:

The gross alpha and beta analysis indicated readings above the LLDs for all but one of the test pits. Accordingly full analysis was conducted for all the test pits that indicated above LLD values for the gross analysis. The concentration of the primordial nuclides appeared to reflect the decay chain they belong to, all values being well within the estimated naturally occurring levels. The Uranium and Thorium nuclides were below 1 pCi/g for all the test pit samples. Radium and Radon were not observed in these samples.

In the gamma analysis, the test pit samples indicates a small concentration of Potassium-40, which is within the naturally occurring concentrations for this nuclide. One of the test pit soil samples indicated the presence of low levels of Carbon-14.

Test pit TP-12 did not indicate values above the LLDs for the gross alpha and beta analysis and therefore a detailed analysis was not completed for this sample.

The monitoring well ground water and soil samples from the refuse area indicate a similar variation as that of the samples discussed above. Both indicate slightly above LLD levels for the gross alpha and beta analysis. The soil sample detailed analysis indicated positive values for the decay series elements. The soil sample also indicated small levels of Lead-212. All the levels of activity are within naturally occurring concentrations.

The hand augered samples also revealed the presence of alpha and beta emitters in the gross analysis. The Uranium series elements reflected steady state concentrations for both samples. Radium-226 and Radon-222 were below their respective LLDs.

No recommendation is made for this location.

4.9 Septic System Area

Field Location and Description:

The septic system drain field is located along the boundary of the BRF, due south from where the kennels are located. This system was in use about 20 years ago and was a disposal site for liquids from the laboratory. Two monitoring wells were advanced in this site. One split spoon sample and one ground water sample were collected from each of these wells.

A duplicate water sample was collected from one of the monitoring wells, MW-3, in accordance with procedures to perform quality assurance of the analysis process. This was labeled MW-30.

Additionally, eight soil samples were collected from eight different test pits that were dug up to cover the entire septic drain field area. Four of these were dug adjacent to the four septic tanks that are located along the boundary of the BRF. The approximate locations of these test pits are shown in Fig 2.1(b). Test pit samples included stained soil and sludge from the leach bed.

Analysis Results:

The monitoring well MW-3 soil and water analysis indicate near LLD values in the gross alpha and beta analysis. Detailed isotopic analysis was not completed for these samples. No gamma activity was detected. The Carbon-14 and Tritium levels for these samples were also below their respective LLD values.

The duplicate water sample, MW-30, indicated values that were nearly identical to the water sample from the same well, MW-3. No alpha or beta isotopic analysis was carried out for this sample. No gamma activity, Carbon-14 or Tritium activity was identified in this sample.

The monitoring well MW-4 samples indicate levels slightly above the LLD values in the gross analysis. The detailed analysis results indicate traces of alpha and beta emitters all below naturally occurring levels.

The test pit samples indicate nearly consistent behavior in the concentrations of the decay chain nuclides. Radium and Radon were at levels below their respective LLDs. None of the values seen are above naturally occurring levels.

Potassium-40 is present at levels within naturally occurring concentrations. No Carbon-14 or Tritium were identified.

Test pit TP-8 indicated below LLD levels for gross alpha and beta analysis. Alpha and beta isotopic analyses were not completed for this sample. Analysis for gamma, Carbon-14 and Tritium were completed and the results were all below the respective LLDs.

No recommendation is made for this location.

4.10 The UST Area

Field Location and Description:

The Underground Storage Tanks (USTs) are in the BRF, adjacent to the service vehicles garage. One monitoring well was advanced and a split spoon sample and a ground water sample were obtained. An additional soil sample was obtained from a hand augered boring. All the samples were screened for gross values and on obtaining positive identification, they were analyzed in detail.

Analysis Results:

The soil samples from both the monitoring well and the hand augered boring indicate concentrations of the respective decay chain nuclides. All these levels are below concentrations for naturally occurring nuclides.

The soil samples also indicate traces of Potassium-40 and Carbon-14. These levels are also well within acceptable limits.

The water sample from the monitoring well indicated low concentrations of Radon-222 and Ra-228. Tritium concentrations for this sample were below the LLD values.

No recommendation is made for this location.

5.0 LITERATURE ANALYSIS AND RESULTS

This section describes the findings from a literature search of license documents relating to the FDA - Beltsville site. The literature search was conducted primarily using the NRC Public Document Room (PDR) document database. This database was remotely accessed using a modern and a series of searches were conducted to retrieve a complete list of relevant documents. Pertinent documents were selected and obtained from our NRC liaison in Washington, D.C.

A summary of the documents obtained are as follows:

- ORIGINAL LICENSE
- LICENSE AMENDMENTS NO. 1 THROUGH 46.
- SAFETY INSPECTIONS 80-01, 81-01, 84-01, 88-001, 91-001.
- NOTICES OF VIOLATION FOR CORRESPONDING SAFETY INSPECTIONS.
- CORRECTIVE ACTIONS.
- MISCELLANEOUS DOCUMENTS.

5.1 License Amendments

License Amendments are issued to record any change in the original license terms and conditions. All the 46 amendments made to the original license have been reviewed. Most of the amendments change the amount of byproduct material that is allowed to be held by the facility at any time. Others include procedural changes, licensee address changes or new Radiation Safety Officer appointments. A description of the amendments is given below. The last five amendments made are described in detail.

The following license amendments changed the maximum amount of byproduct material that could be held by the facility.

Amendment No: 1, 2, 4, 5, 6, 7, 8, 9, 10, 11, 12, 14, 15, 17, 18, 19, 20, 21, 22, 24, 25, 26, 28, 30, 32, 34, 35, 36, 37, 40, 41.

The maximum allowable byproduct material as defined by the license and the above mentioned amendments at any time were as follows:

BYPRODUCT MATERIAL	FORM	MAXIMUM ALLOWABLE
A. Any byproduct material with Atomic Numbers 3-83 inclusive	Any	Not to exceed 200mCi of each Radionuclide
B. Hydrogen - 3	Any	120
C. Xenon - 133	Any	1Ci
D. Plutonium - 238	Sealed Source	30mCi
E. Plutonium - 239	Calibration Source	0.5 μgm
F. Carbon - 14	**	1Ci
G. Nickel - 63	Any	10Ci
H. Mercury - 203	Any	10mCi

The following additional changes apply to Amendments 1 through 41:

- Amendment 1 defined the testing requirements for sealed sources.
- Amendment 3 and 37 defined caution color coding requirements for sources.
- Amendment 7 included testing requirements for Sr-90.
- Amendment 13 defined the contamination testing procedure for H-3.
- Amendment 16 changed the expiration date of the license.
- Amendment 23 indicated a supervisor change.
- Amendment 26 modified the conditions for leak testing and defined the incinerator disposal levels. This was also addressed by Amendment 31.

- Amendment 27 and 39 indicated address modifications of the licensed facilities.
- Amendment 35 defined the bioassay requirements for persons conducting operations.
- Amendment No. 42: Dated January 11, 1985
 Changes the name and address of the licensee from Department of Health and Human Services, Food & Drug Administration, 200 C St., S.W. Washington, D.C. 20204 to Department of Health and Human Services, Food & Drug Administration, Radiation Safety, HFF-14, 200 C St., S.W., Washington D.C. 20204.
- Amendment No. 43: Dated January 6, 1988
 This amendment renews the license for the facility covering a period to December 31, 1992.
- Amendment No. 44: Dated March 29, 1988
 This amendment appoints Doris Waddick as the Acting Radiation Safety
 Officer.
- Amendment No. 45: Dated September 3, 1988
 Appoints Doris Waddick as the Radiation Safety Officer
- Amendment No. 46: Dated February 11, 1991
 The following changes were made to the license.

The complete address of the Beltsville Research complex was included in the address of the licensee.

The testing requirements for sealed sources and detector cells were rephrased as follows:

- Test intervals for these sources should not exceed six months or at such other intervals as are specified by the certificate of registration referred to in 10CFR32.210, not to exceed three years.
- Notwithstanding the previous condition, sealed sources designed to emit alpha particles shall be tested for leakage and/or contamination at less than three month intervals.
- Sealed sources and detector cells need not be leak tested if:
 - They contain only Hydrogen 3; or
 - ii. They contain only Krypton 85; or
 - iii. The half life of the isotope is 30 days or less; or
 - iv. They have not more than $100\mu\text{C}$ of Beta emitters and/or Gamma emitters or not more than $10\mu\text{C}$ of alpha emitters; or
 - v. They are not designed to emit alpha particles, are in storage and are not being used. No sealed sources or detector cells shall be stored for more than 10 years without testing.

The remaining conditions were rearranged and reworded but their implications did not change with this amendment.

5.2 Safety Inspections, Violations, Corrective Actions

The following is a summary of the safety inspections, violations recorded and corrective actions obtained from the PDR.

XGR-001-002

- Safety Inspection 80-01: Dated May 20, 1980
 - Surveys to comply with 10CFR20.101 that limits the radiation exposure to the extremities of individuals were not conducted.
 - Survey to comply with 10CFR20.207 "Storage and Control of Licensed Materials in Unrestricted Areas", were not conducted.

No corrective actions are recorded.

- 2. Safety Inspection 81-01: Dated September 23, 1981
 - Survey of Laboratories using radionuclides was not conducted. This
 was in non-compliance with item number 1.9 of the Radiation Safety
 Handbook.
 - GM meters had not been calibrated for more than six months. This was in violation to commitment (Item 11) in the letter dated November 17, 1980.

Corrective actions were taken to rectify the above-mentioned violations.

- 3. Safety Inspection 84-01: Dated February 20, 1985
 - The Radiation Safety Committee had not met for more than six months violating Item 1.7 of the Radiation Safety Handbook.

Corrective actions were taken to rectify this violation.

- 4. Safety Inspections 88-001: Dated October 5, 1988
 - No violations

- 5. Safety Inspection 91-001: Dated July 18, 19, 1991.
 - Refrigerators containing licensed material, located in an unrestricted corridor at the Beltsville Research facility were not locked and were not under constant surveillance. This was found to be in non-compliance with the following sections of Title 10 Code of Federal Regulations.

10CFR20.207(a) 10CFR20.207(b) 10CFR20.3(a)(17)

- Principal radioisotope user's inventory records were not properly maintained. Specifically, the receipt, use and disposal of licensed material was not entered on inventory forms for periods as long as one month. This was found to be not in compliance with condition 20 of the license, Section 1.11 a(6) of the Radiation Safety Handbook and Item 7 of the letter dated October 26, 1987.
- Disposals to the sanitary sewerage system were not recorded. Records
 of activity concentrations and total activity released were not
 maintained. This was found not to be in compliance with Section
 10CFR20.303 of Title 10 Code of Federal Regulations.
- License, license conditions, amendments and related documents were not posted for employee information. This was found to be not in compliance with Section 10CFR19.11(a) (b) (c) of Title 10 Code of Federal Regulations.

Corrective actions were taken to rectify the abovernentioned violations.

5.3 Miscellaneous Documents

Other documents obtained from the PDR were:

- Resume of the Radiation Safety Officer
- Financial Assurance for Decommissioning

The PDR database has the listing of all correspondence that took place after 1978. Any amendments, violations or correspondence before this year cannot be obtained directly from the PDR. A separate Freedom of Information Act (FOIA) request was filed directly with the NRC to release all documents associated with the license under docket #30-03917. All the information obtained from the NRC and that obtained from the PDR is included in Appendix D.

6.0 CONCLUSION

The radiological contamination assessment for the FDA Beltsville site was conducted by excavating soil and ground water samples from subsurface depths. 41 soil samples and 16 ground water samples were collected. The samples were analyzed by a certified laboratory for gross alpha, beta and gamma analysis and on positive detection a complete analysis was conducted.

The complete analysis involved measurement of the Uranium isotopes, the Thorium isotopes, the Radium isotopes, Radon, Carbon-14 and Tritium.

The primordial chain nuclides indicated consistent concentrations with levels for naturally occurring radionuclides for all samples. One sample indicated above natural level concentrations and has been submitted for reanalysis. Potassium-40 and Tritium were found to be in the order of concentrations for naturally occurring radionuclides for all samples. Traces of Cs-137 were observed in two samples. This may be attributed to statistical fluctuation in the analytical process. A few Carbon-14 samples indicated slightly above naturally occurring levels. These levels are not due to past or present licensed activities of the research facility and are not sufficient to pose a threat of contamination.

Overall, no inordinate radioactive material concentrations were observed in any of the samples. Based on the existing sample analytical results, it is concluded that the radioactive levels observed are all within acceptable levels for naturally occurring radionuclides.

7.0 REFERENCES

- Radiological Quality of the Environment in the United States, 1977, U.S. Environmental Protection Agency, EPA 520/1-77-009.
- Exposure of the Population in the United States and Canada from Natural Background Radiation, NCRP-94, National Council for Radiation Protection, December 30, 1987.
- Tritium in the Environment, NCRP-67, National Council for Radiation Protection, 1979.
- Ground Water Concentrations of Radiums, Isotopes, Health Physics Journal, Vol. 48, No. 5.
- Radiological Health Handbook, U.S. Department of Health, Education and Welfare, January 1970.

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CERTIFICATE OF ANALYSIS

Client

Pacific Nuclear

1111 Pasquinelli Drive

Suite 100

Westmont, Illinois 60559

Contact:

Ms. Cathy Hall

cc: PCFN00193

Report Date: June 04, 1993

Page 1 of 3

Sample ID : FDA-MW-3
Lab ID : 9304566-01
Matrix : GroundH2O
Date Collected : 04/27/93
Date Received : 04/30/93
Priority : Routine
Collector : Client

Parameter	Qualifier	Result Units	Method	In Indiana Burney
Radiological		Trouis Chris	Method	Analyst Date Time
Gross Alpha - 3 ilei	21.5			
Accuracy, Gross A		1 02 -0:4		
Gross Alpha	pna	1.03 pCi/L		DHC 05/08/93 1200
Weight of Sample,	A P. D	2.65 pCi/L		
Nonvolatile Beta -	NOC D	22.7 mg	경험을 다니 생각하다다	
Accuracy, Nonvola		0.000 00		
Nonvolatile Beta	The Dera	0.990. pCi/L		
Weight of Sample,	A F.D	4.53 pCi/L		
Gamma PHA - 40 ii		22.7 mg		
Accuracy, Actinium		0.00 .018		
Accuracy, Antimon		0.00 pCi/L	HASL 300	MDS 05/04/93 0304
Accuracy, Cerium-		0.00 pCI/L		
Accuracy, Cesium-		0.00 pCi/L		
Accuracy, Cesium-		0.00 pCi/L		
Accuracy, Cobalt-5		0.00 pCi/L		
Accuracy, Cobalt-6		0.00 pCi/L		
Accuracy, Europium		0.00 pCi/L		
Accuracy, Europium		0.00 pCi/L		
Accuracy, Europium		0.00 pCi/L		
Accuracy, Lead-212		0.00 pCi/L		
		15.3 pCi/L		
Accuracy, Mangane		0.00 pCi/L		
Accuracy, Potassium		52.7 pCi/L		
Accuracy, Promethi		0.00 pCi/L		
Accuracy, Promethi		0.00 pCi/L		
Accuracy, Rutheniu		0.00 pCi/L		
Accuracy, Sodium-2		0.00 pCi/L		
Accuracy, Thorium-		0.00 pCi/L		
Accuracy, Yttrium-8	38	0.00 pCi/L		
Accuracy, Zinc-65		0.00 pCi/L		

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Report Date: June 04, 1993

Page 2 of 3

	Sample ID	: FDA-MW	-3		
Parameter	Qualifier	Result Units	Method	Analyst	Date Tim
Actinium-228	<	30.0 pCi/L			***************************************
Antimony-125	<	20.0 pCi/L	HASL 300	MDS 05/04	1/93 0304
Cerium-144	<	60.0 pCi/L		11200 00/0	175 050
Cesium-134	<	10.0 pCi/L			
Cesium-137	<	10.0 pCi/L			
Cobalt-57	<	10.0 pCi/L			
Cobalt-60	<	10.0 pCi/L			
Europium-152	<	40.0 pCi/L			
Europium-154	<	20.0 pCi/L			
Europium-155	<	30.0 pCi/L			
Lead-212	<	15.0 pCi/L			
Manganese-54	<	10.0 pCi/L			
Potassium-40		110 pCi/L			
Promethium-144	<	10.0 pCi/L			
Promethium-146	<	10.0 pCi/L			
Ruthenium-106	<	90.0 pCi/L			
Sodium-22	<	10.0 pCi/L			
Thorium-234	<	350 pCi/L			
Yttrium-88	<	60.0 pCi/L			
Zinc-65	<	20.0 pCi/L			
Carbon 14 - 2 items					
Accuracy, Carbon-1	4	25.3 pCi/L	HASL 300	WBS 05/20	In 1006
Carbon-14	<	200 pCi/L	***************************************	W.D.S 03/20	/93 1805
Radon-222 - 2 items					
Accuracy, Radon-22	2	133 pCi/L	HASL 300	MDS 05/04	f)2 +050
Radon-222	<	200 pCi/L	11101 200	MDS 05/04	/93 1929
Tritium - 2 items		Post D			
Accuracy, Tritium		0.200 pCi/mL ·	EPA 906.0	Ame orne	na n
Tritium	<	0.700 pCi/mL	M 7 700,0	MDS 05/06	/93 0152

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Report Date: June 04, 1993

Page 3 of 3

Sample ID

: FDA-MW-3

Parameter

Qualifier

Result Units

Method

Analyst

Date Time

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Mack Swafford at (803) 556-8171.

Knalytical Report Specialist

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Laboratory Certifications

FL.	D9015 (P200)
7.70	E87156/57294
NC	233
SC	10120
TN	02934
VA	00151
WI	99988779

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Report Date: June 03, 1993

Page 1 of 3

Sample ID : FDA-MW-4 Lab ID : 9304566-03 Matrix : GroundH2O Date Collected : 04/27/93 Date Received : 04/30/93 Priority : Routine Collector : Client

Parameter	Qualifier	Result Units	Method	Analyst	Date.	Tim
adiological						
Gross Alpha - 3 items						
Accuracy, Gross Alpha		1.04 pCi/L		DHC	05/08/93	1200
Gross Alpha		2.75 pCi/L				
Weight of Sample, A&B		21.1 mg				
Nonvolatile Beta - 3 item	LS					
Accuracy, Nonvolatile B	leta	1.04 pCi/L				
Nonvolatile Beta		5.56 pCi/L				
Weight of Sample, A&B		21.1 mg				
Alpha Spectroscopy Tho						
Accuracy, Thorium-228		0.118 pCi/L	HASL 300	CSH	05/17/93	180
Accuracy, Thorium-230		0.0831 pCi/L			A 1 1 1 1 1 1 1 1	100
Accuracy, Thorium-232		0.00 pCi/L				
Thorium-228	<	1.00 pCi/L				
Thorium-230	<	1.00 pCi/L				
Thorium-232	<	1.00 pCi/L				
Alpha Spectroscopy Ura	nium - 6 items					
Accuracy, Uranium-233/	234	0.190 pCi/L	HASL 300	BTM	05/17/93	1342
Accuracy, Uranium-235		0.00 pCi/L			02/11/20	1072
Accuracy, Uranium-238		0.110 pCi/L				
Uranium-233/234	<	1.00 pCi/L				
Uranium-235	<	1.00 pCi/L				
Uranium-238	<	1.00 pCi/L				
Gamma PHA - 40 items						
Accuracy, Actinium-228		0.00 pCi/L	HASL 300	MDS	05/04/93	2115
Accuracy, Antimony-125		0.00 pCi/L			02/04/22	4110
Accuracy, Cerium-144		0.00 pCi/L				
Accuracy, Cesium-134		0.00 pCi/L				
Accuracy, Cesium-137		0.00 pCi/L				
Accuracy, Cobalt-57		0.00 pCi/L				

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	Sample ID	: FDA-M	W-4	
Parameter	Qualifier	Result Units	Method	Analyst Date Time
Accuracy, Cobalt-	50	0.00 pCi/L		
Accuracy, Europiu		0.00 pCi/L	HASL 300	MDS 05/04/93 2115
Accuracy, Europiu	m-154	0.00 pCi/L		
Accuracy, Europiu	m-155	0.00 pCi/L		
Accuracy, Lead-21	2	0.00 pCi/L		
Accuracy, Mangan	ese-54	0.00 pCi/L		의 경기교육 전시 기업으로 # 11
Accuracy, Potassiu	ım 40	55.5 pCi/L		
Accuracy, Prometh	ium-144	0.00 pCi/L		
Accuracy, Prometh	ium-146	0.00 pCi/L		
Accuracy, Rutheni	um-106	0.00 pCi/L		
Accuracy, Sodium-	22	0.00 pCi/L		
Accuracy, Thorium	1-234	0.00 pCi/L		
Accuracy, Yttrium-	-88	0.00 pCi/L		
Accuracy, Zinc-65		0.00 pCi/L		
Actinium-228	<	30.0 pCi/L		
Antimony-125	<	20.0 pCi/L		
Cerium-144	<	60.0 pCi/L		
Cesium-134	<	10.0 pCi/L		
Cesium-137	<	10.0 pCi/L		
Cobalt-57	<	10.0 pCi/L		
Cobalt-60	<	10.0 pCi/L		
Europium-152	<	40.0 pCi/L		
Europium-154	<	20.0 pCi/L		
Europium-155	<	30.0 pCi/L		
Lead-212	<	15.0 pCi/L		
Manganese-54	<	10.0 pCi/L		
Potassium-40	<	110 pCi/L		
Promethium-144	<	10.0 pCi/L		
Promethium-146	<	10.0 pCi/L		
Ruthenium-106	<	90.0 pCi/L		
Sodium-22	<	10.0 pCi/L		
Thorium-234	<	350 pCi/L		
Yttrium-88	<	60.0 pCi/L		
Zinc-65	<	20.0 pCi/L		
Carbon 14 - 2 items				
Accuracy, Carbon-	14	31.6 pCi/L	HASL 300	WBS 05/20/93 1906

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Parameter	Qualifier	Result Units	Method	Analyst	Date	Time
Carbon-14 Radium-226 - 2 items	<	200 pCi/L				
Accuracy, Radium-226 Radium-226 Radium-228 - 2 items		0.450 pCi/L 1.31 pCi/L	EPA 903	ADW (05/17/93	1305
Accuracy, Radium-228 Radium-228 Radon-222 - 2 items	<	1.00 pCi/L 1.00 pCi/L	EPA 904.0	RLM (05/18/93	2136
Accuracy, Radon-222 Radon-222 Tritium - 2 items		134 pCi/L 204 pCi/L	HASL 300	MDS (5/04/93	2138
Accuracy, Tritium Tritium	<	0.200 pCi/mL 0.700 pCi/mL	EPA 906.0	MDS 0	5/06/93	0656

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Sample ID

Lab ID

: FDA-MW-30 : 9304566-02

Matrix

: GroundH2O

Date Collected

: 04/27/93

Date Received

: 04/30/93

Priority

: Routine

Collector

: Client

Parameter	Qualifier	Result Units	Method	Analyst Da	te Time
Radiological					-
Gross Alpha - 3 items					
Accuracy, Gross Alpha		1.05 pCi/L		DHC 05/08/9	3 1200
Gross Alpha		3.09 pCi/L		2110 05/00/	2 1400
Weight of Sample, A&E	3	15.1 mg			
Nonvolatile Beta - 3 iten	11.5				
Accuracy, Nonvolatile E	Beta	0.960 pCi/L			
Nonvolatile Beta		4.07 pCi/L			
Weight of Sample, A&F	3	15.1 mg			
Gamma PHA - 40 items					
Accuracy, Actinium-228	3	0.00 pCi/L	HASL 300	MDS 05/04/9	3 2116
Accuracy, Antimony-12	5	0.00 pCi/L		11.00 03/04/2	2 2110
Accuracy, Cerium-144		0.00 pCi/L			
Accuracy, Cesium-134		0.00 pCi/L			
Accuracy, Cesium-137		0.00 pCi/L			
Accuracy, Cobalt-57		0.00 pCi/L			
Accuracy, Cobalt-60		0.00 pCi/L			
Accuracy, Europium-15:	2	0.00 pCi/L			
Accuracy, Europium-15	4	0.00 pCi/L			
Accuracy, Europium-15.	5	0.00 pCi/L			
Accuracy, Lead-212		8.27 pCi/L			
Accuracy, Manganese-5-	4	0.00 pCi/L			
Accuracy, Potassium-40		0.00 pCi/L			
Accuracy, Promethium-	44	0.00 pCi/L			
Accuracy, Promethium-	146	0.00 pCi/L			
Accuracy, Ruthenium-10	06	0.00 pCi/L			
Accuracy, Sodium-22		0.00 pCi/L			
Accuracy, Thorium-234		0.00 pCi/L			
Accuracy, Yttrium-88		0.00 pCi/L			
Accuracy, Zinc-65		0.00 pCi/L			

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	Sample ID	: FDA-MW	7-30			
Parameter	Qualifier	Result Units	Method	Analyst	Date	Time
Actinium-228	<	30.0 pCi/L				-
Antimony-125	<	20.0 pCi/L	HASL 300	MDS	05/04/93	2116
Cerium-144		60.0 pCi/L				
Cesium-134	<	10.0 pCi/L				
Cesium-137	<	10.0 pCi/L				
Cobalt-57	<	10.0 pCi/L				No.
Cobalt-60	<	10.0 pCi/L				
Europium-152	<	40.0 pCi/L				
Europium-154	<	20.0 pCi/L				
Europium-155	<	30.0 pCi/L				
Lead-212	<	15.0 pCi/L				
Manganese-54	<	10.0 pCi/L				
Potassium-40	<	110 pCi/L				
Promethium-144	<	10.0 pCi/L				
Promethium-146	<	10.0 pCi/L				
Ruthenium-106	<	90.0 pCi/L				
Sodium-22	<	- 10.0 pCi/L				
Thorium-234	<	350 pCi/L				
Yttrium-88	<	60.0 pCi/L				
Zinc-65	<	20.0 pCt/L				
Carbon 14 - 2 items						
Accuracy, Carbon-14		19.0 pCi/L	HASL 300	WBS	05/20/93	1835
Carbon-14	<	200 pCi/L			W. C. L. C.	*0.00
Radon-222 - 2 items						
Accuracy, Radon-222	The second second	133 pCi/L	HASL 300	MDS	05/04/93	2034
Radon-222	<	200 pCi/L				and Diff
Tritium - 2 items						
Accuracy, Tritium		0.200 pCi/mL	EPA 906.0	MDS	05/06/93	0152
Tritium	<	0.700 pCi/mL			02/00/22	0104

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Sample ID

: FDA-MW-30

Parameter

Qualifier

Result Units

Method

Analyst

Date Time

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Sample ID : FDA-MW-3 Lab ID : 9304312-10 Matrix : Soil Date Collected : 04/15/93 Date Received : 04/16/93 Priority : Routine Collector : Client

Parameter	Qualifier	Result Units	Method	Analyst	Date	Time
diological					The state of the s	490
Gross Alpha - 3 items						
Accuracy, Gross Alpha		0.900 pCi/g		CWS	04/22/93	1720
Gross Alpha	<	5.00 pCi/g				
Weight of Sample, A&B		3.00 mg				
Nonvolatile Beta - 3 items						
Accuracy, Nonvolatile Bet	ta	1.04 pCi/g				
Nonvolatile Beta	<	5.00 pCi/g				
Weight of Sample, A&B		3.00 mg				
Gamma PHA - 40 items						
Accuracy, Actinium-228		-0.00 pCi/g	HASL 300	MDS	04/30/93	1143
Accuracy, Antimony-125		0.00 pCi/g				
Accuracy, Cerium-144		0.00 pCi/g				
Accuracy, Cesium-134		0.00 pCi/g				
Accuracy, Cesium-137		0.00 pCi/g				
Accuracy, Cobalt-57		0.00 pCi/g				
Accuracy, Cobalt-60		0.00 pCi/g				
Accuracy, Europium-152		0.00 pCi/g				
Accuracy, Europium-154		0.00 pCi/g				
Accuracy, Europium-155		0.00 pCi/g				
Accuracy, Lead-212		0.0519 pCi/g				
Accuracy, Manganese-54		0.00 pCi/g				
Accuracy, Potassium-40		0.350 pCi/g				
Accuracy, Promethium-14	4	0.00 pCi/g				
Accuracy, Promethium-14	6	0.00 pCi/g				
Accuracy, Ruthenium-106		0.00 pCi/g				
Accuracy, Sodium-22		0.00 pCi/g				
Accuracy, Thorium-234		0.00 pCi/g				
Accuracy, Yttrium-88		0.00 pCi/g				
Accuracy, Zinc-65		0.00 pCi/g				

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		Sample ID	: FDA-	MW-3			
Par	rameter	Qualifier	Result Units	Method	Analyst	Date	Time
Act	unium-228	<	1.00 pCl/g				
An	timony-125	<	0.200 pCi/g	HASL 300	MDS	04/30/93	1142
Cer	ium-144	<	0.500 pCi/g				
Ces	sium-134	<	0.100 pCi/g				
Ces	sium-137	<	0.100 pCi/g				
Col	balt-57	<	0.100 pCi/g			*	-
Col	balt-60	<	0.100 pCi/g				
Eur	opium-152	<	0.500 pCi/g				
Eur	ropium-154	<	0.200 pCi/g				
Eur	opium-155	<	0.200 pCi/g				
Lea	id-212	<	1.00 pCi/g				
Ma	nganese-54	<	0.100 pCi/g				
Pot	assium-40	<	1.00 pCi/g				
Pro	methium-144	<	0.100 pCi/g				
Pro	methium-146	<	0.100 pCi/g				
Rut	thenium-106	<	0.800 pCi/g				
Soc	lium-22	<	0.700 pCi/g				
Tho	orium-234	<	5.00 pCi/g				
Ytt	rium-88	<	0.100 pCi/g				
Zin	c-65	<	0.200 pCi/g				
Car	bon-14 - 2 items						
A.C.C	curacy, Carbon-14		9.37 pCi/g	HASL 300	WBS	05/06/93	1425
Car	bon-14	<	20.0 pCi/g				
Rac	lon-222 - 2 items						
Acc	curacy, Radon-222		0.00 pCi/g	HASL 300	MDS	04/23/93	1212
Rac	lon-222	<	1.00 pCi/g				
Trit	ium - 2 items						
Acc	curacy, Tritium		4.38 pCi/g	EPA 906.0 modified	ADW	04/22/93	1630
	ium	<	2.00 pCi/g				

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Sample ID

: FDA-MW-3

Parameter

Qualifier

Result Units

Method

Analyst

Date Time

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Sample ID

: FDA-MW-4

Lab ID

: 9304422-02

Matrix

: Soil

Date Collected Date Received

: 04/16/93

Priority

: 04/22/93 : Routine

Collector

: Client

Parameter	Qualifier	Result Units	Method	Analyst	Date	Time
Radiological						No.
Gross Alpha - 3 items						
Accuracy, Gross Alph	a	2.06 pCi/g		CWS	04/27/93	1230
Gross Alpha		5.23 pCl/g		0113	104/7/1/22	1231
Weight of Sample, A&		9.50 mg				
Nonvolatile Beta - 3 its	ems					
Accuracy, Nonvolatile	Beta	1.83 pCi/g				
Nonvolatile Beta		5.80 pCi/g				
Weight of Sample, A&	B	9.50 mg				
Alpha Spectroscopy Th	norium - 6 items					
Accuracy, Thorium-22		.0.00 pCi/g	HASL 300	AHT	05/18/93	1739
Accuracy, Thorium-23		0.00 pCi/g			02/10/22	3 × 32
Accuracy, Thorium-23	2	0.256 pCi/s				
Thorium-228	<	0.200 pCi/g				
Thorium-230	<	0.200 pC:/g				
Thorium-232		0.471 rCi/g				
Alpha Spectroscopy Ur	anium - 6 items					
Accuracy, Uranium-23		0.173 pCi/g	HASL 300	AHT	05/26/93	0041
Accuracy, Uranium-23		0.0369 pCi/g		7431	02/20/22	(K)+1
Accuracy, Uranium-23	8	0.158 pCi/g				
Uranium-233/234		0.488 pCi/g				
Uranium-235	<	0.500 pCi/g				
Uranium-238		0.446 pCi/g				
Gamma PHA - 40 item	5					
Accuracy, Actinium-22		0.150 pCi/g	HASL 300	MDS	04/27/93	2002
Accuracy, Antimony-1	25	0.00 pCi/g		141173	U4/21/93	2002
Accuracy, Cerium-144		0.00 pCi/g				
Accuracy, Cesium-134		0.00 pCi/g				
Accuracy, Cesium-137		0.00 pCi/g				
Accuracy, Cobalt-57		0.00 pCi/g				

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	Sample ID	: FDA-M	W-4	Here wing		-
Parameter	Qualifier	Result Units	Method	Analyst	Date	Time
Accuracy, Cobalt-60		0.00 pCi/g				-
Accuracy, Europium-	-152	0.00 pCi/g	HASL 300	MDS	04/27/93	2002
Accuracy, Europium		0.00 pCi/g		IVIDS	UM/21/93	2002
Accuracy, Europium-	-155	0.00 pCi/g				
Accuracy, Lead-212		0.0632 pCi/g				
Accuracy, Manganes	e-54	0.00 pCi/g				
Accuracy, Potassium		0.477 pCi/g				-
Accuracy, Promethiu	m-144	0.00 pCi/g				
Accuracy, Promethiu	m-146	0.00 pCi/g				
Accuracy, Ruthenium	n-106	0.00 pCi/g				
Accuracy, Sodium-22	2	0.00 pCi/g				
Accuracy, Thorium-2	134	3.54 pCi/g				
Accuracy, Yttrium-88	8	0.00 pCi/g				
Accuracy, Zinc-65		0.00 pCi/g				
Actinium-228	<	1.00 pCi/g				
Antimony-125	<	0.200 pCi/g				
Cerium-144	<	0.500 pCi/g				
Cesium-134	<	0.100 pCi/g				
Cesium-137	<	0.100 pCi/g				
Cobalt-57	<	0.100 pCi/g				
Cobalt-60	<	0.100 pCi/g				
Europium-152	<	0.500 pCi/g				
Europium-154	<	0.200 pCi/g				
Europium-155	<	0.200 pCi/g				
Lead-212	<	1.00 pCi/g				
Manganese-54	<	0.100 pC /a				
Potassium-40		1.81 pCi/g				
Promethium-144	<	0.100 pCi/g				
Promethium-146	<	0.100 pCi/g				
Ruthenium-106	<	0.800 pCi/g				
Sodium-22	<	0.700 pCi/g				
Thorium-234	<	5.00 pCi/g				
Yttrium-88	<	0.100 pCi/g				
Zinc-65	<	0.200 pCi/g				
Carbon-14 - 2 items						
Accuracy, Carbon-14		3.28 pCi/g	HASL 300	WBS (5/13/93	1205

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Sample ID

: FDA-MW-4

Parameter		Qualifier	Result U	nits	Method	Analyst	Date	Time
Carbon-14		<	20.0 p	Ci/g				
Radium-22	6 - 2 items							
Accuracy, 1	Radium-226		0.0820 p	Ci/g	EPA 903	MDS	05/04/93	0846
Radium-22	6	<	1.00 p	Ci/g				
Radium-22	8 - 2 items							
Accuracy,	Radium-228		0.136 p	Ci/g	EPA 904.0	MDS	05/04/93 -	0 846
Radium-22		<	1.00 p					
Radon-222	- 2 items							
Accuracy, 1	Radon-222		0.100 p	Ci/g	HASL 300	MDS	04/27/93	2002
Radon-222		<	1.00 p					
Tritium - 2	items							
Accuracy,	Tritium		4.84 p	Ci/g	EPA 906.0 modified	ADW	05/07/93	1230
Tritium		<	2.00 p					

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: FDA-TP-1 Sample ID Lab ID : 9304312-11 Matrix : Soil Date Collected : 04/08/93 Date Received : 04/16/93 Priority : Routine Collector : Client

Parameter	Qualifie-	Result U	nits	Method	Analyst	Date	Time
Radiological							*************
Gross Alpha - 3 item	15						
Accuracy, Gross Alp	ha	1.61 p	Ci/g		CWS	04/22/93	1720
Gross Alpha		11.9 p	Ci/g				
Weight of Sample, A	&B	19.7 m	g				
Nonvolatile Beta - 3	items						
Accuracy, Nonvolati	le Beta	1.43 pt	Ci/g				
Nonvolatile Beta		15.0 pt					
Weight of Sample, A	&B	19.7 m					
Alpha Spectroscopy	Thorium - 6 items						
Accuracy, Thorium-	228	0.232 pt	Ci/g	HASL 300	AHT	05/04/93	1834
Accuracy, Thorium-	230	0.261 pt					
Accuracy, Thorium-	232	0.267 pt	700				
Thorium-228		0.772 pt					
Thorium-230		0.981 pc					
Thorium-232		1.02 pc					
Alpha Spectroscopy	Uranium - 6 items						
Accuracy, Uranium-	233/234	0.203 pc	Ci/g	HASL 300	AHT	05/04/93	1835
Accuracy, Uranium-	235	0.0406 pc	CVg				
Accuracy, Uranium-	238	0.198 pc	Ci/g				
Uranium-233/234		0.925 pc	Ci/g				
Uranium-235	<	0.500 pC					
Uranium-238		0.898 pc	Ci/g				
Gamma PHA - 40 ite	771.5						
Accuracy, Actinium-	228	0.172 pC	Zi/g	HASL 300	MDS	04/30/93	1143
Accuracy, Antimony	-125	0.00 pc					
Accuracy, Cerium-14	4	0.00 pc					
Accuracy, Cesium-13	34	0.00 pc					
Accuracy, Cesium-13	37	0.00 pC	100				
Accuracy, Cobalt-57		0.00 pC					

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Parameter Qual	ifier	Result Units	Method	Analyst Date Tim
Accuracy, Cobalt-60		0.00 pCi/g		
Accuracy, Europium-152		0.00 pCi/g	HASL 300	MDS 04/30/93 114
Accuracy, Europium-154		0.00 pCi/g		
Accuracy, Europium-155		0.00 pCi/g		
Accuracy, Lead-212		0.0715 pCi/g		
Accuracy, Manganese-54		0.00 pCi/g		
Accuracy, Potassium-40		0.740 pCi/g		
Accuracy, Promethium-144		0.00 pCi/g		
Accuracy, Promethium-146		0.00 pCi/g		
Accuracy, Ruthenium-106		0.00 pCi/g		
Accuracy, Sodium-22		0.00 pCi/g		
Accuracy, Thorium-234		1.57 pCi/g		
Accuracy, Yttrium-88		0.00 pCi/g		
Accuracy, Zinc-65		0.00 pCi/g		
Actinium-228	<	1.00 pCi/g		
Antimony-125	<	0.200 pCi/g		
Cerium-144	<	0.500 pCi/g		
Cesium-134	<	0.100 pCi/g		
Cesium-137	<	0.100 pCi/g		
Cobalt-57	<	0.100 pCi/g		
Cobait-60	<	0.100 pCi/g		
Europium-152	<	0.500 pCi/g		
Europium-154	<	0.200 pCi/g		
Europium-155	<	0.200 pCi/g		
Lead-212	<	1.00 pCi/g		
Manganese-54	<	0.100 pCi/g		
Potassium-40		6.08 pCi/g		
Promethium-144	<	0.100 pCi/g		
Promethium-146	<	0.100 pCi/g		
Ruthenium-106	<	0.800 pCi/g		
Sodium-22	<	0.700 pCi/g		
Thorium-234	<	5.00 pCi/g		
Yttrium-88	<	0.100 pCi/g		
Zinc-65	<	0.200 pCi/g		
Carbon-14 - 2 items				

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Page 3 of 3

	Sa	mple ID	: FDA-TP-				
,444	Parameter	Qualifier	Result Units	Method	Analys	t Date	Time
	Carbon-14	<	20.0 pCi/g				
	Radium-226 - 2 items						
	Accuracy, Radium-226		0.114 pCi/g	EPA 903	MDS	04/30/93	1143
	Radium-226	<	1.00 pCi/g				
	Radium-228 - 2 items						
	Accuracy, Radium-228		0.172 pCi/g	EPA 904.0	MDS	04/30/93	T143
	Radium-228	<	1.00 pCi/g				
	Radon-222 - 2 items						
	Accuracy, Radon-222		0.107 pCi/g	HASL 300	MDS	04/23/93	.617
	Radon-222	<	1.00 pCi/g				
	Tritium - 2 items						
	Accuracy, Tritium		4.58 pCi/g	EPA 906.0 modified	ADW	04/22/93	1715
	Tritium	<	2.00 pCi/g				

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Page 1 of 3

Sample ID

: FDA-TP-2

Lab ID

: 9304367-01

Matrix

: Soil

Date Collected

: 04/08/93

Date Received

: 04/20/93

Priority Collector : Routine : Client

Parameter	Qualifier	Result	Units	Method	Analyst	Date	Time
Radiological						-	-
Gross Alpha - 3 items							
Accuracy, Gross Alph	a	3.22	pCi/g		CWS	04/28/93	0710
Gross Alpha		7.66	pCi/g				
Weight of Sample, Ad	&B	15.1	mg				
Nonvolatile Beta - 3 it	ems						
Accuracy, Nonvolatile	e Beta	2.80	pCi/g				
Nonvolatile Beta			pCi/g				
Weight of Sample, Ad	¢В	15.1					
Alpha Spectroscopy T							
Accuracy, Thorium-2		0.187	pCi/g	HASL 300	AHT	05/22/93	112
Accuracy, Thorium-2			pCi/g				
Accuracy, Thorium-2	32		pCi/g				
Thorium-228		0.830	pCi/g				
Thorium-230			pCi/g				
Thorium-232			pCi/g				
Alpha Spectroscopy U	ranium - 6 items		4000				
Accuracy, Uranium-2	33/234	0.116	pCi/g	HASL 300	AHT	05/12/93	181
Accuracy, Uranium-2	35	0.0210					
Accuracy, Uranium-2	38		pCi/g				
Uranium-233/234		0.508	A				
Uranium-235	<	0.500					
Uranium-238		0.482					
Gamna PHA - 40 iter	N P						
Accuracy, /.curium-2	228	0.162	pCi/g	HASL 300	MDS	05/03/93	071
Accuracy, Antimony-	125		pCi/g				
Accuracy, Cerium-14			pCi/g				
Accuracy, Cesium-13			pCi/g				
Accuracy, Cesium-13			pCi/g				
Accuracy, Cobalt-57			pCi/g				

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	Sample ID	: FDA-TP	-2	
Parameter	Qualifier	Result Units	Method	Analyst Date Time
Accuracy, Cobalt-6	50	0.00 pCi/g		
Accuracy, Europius	m-152	0.00 pCi/g	HASL 300	MDS 05/03/93 0714
Accuracy, Europius	m-154	0.00 pCi/g		
Accuracy, Europius	m-155	0.00 pCi/g		
Accuracy, Lead-21	2	0.0695 pCi/g		
Accuracy, Mangan	ese-54	0.00 pCi/g		
Accuracy, Potassiu	m-40	0.638 pCi/g		
Accuracy, Prometh	ium-144	0.00 pCi/g		
Accuracy, Prometh	ium-146	0.00 pCi/g		
Accuracy, Rutheniu	ım-106	0.00 pCi/g		
Accuracy, Sodium-	22	0.00 pCi/g		
Accuracy, Thorium	-234	1.92 pCi/g		
Accuracy, Yttrium-	88	0.00 pCi/g		
Accuracy, Zinc-65		0.00 pCi/g		
Actinium-228	<	1.00 pCi/g		
Antimony-125	<	0.200 pCi/g		
Cerium-144	<	0.500 pCi/g		
Cesium-134	- · · · · · · · · · · · · · · · · · · ·	0.100 pCi/g		
Cesium-137	<	0.100 pCi/g		
Cobalt-57	<	0.100 pCi/g		
Cobalt-60	<	0.100 pCi/g		
Europium-152	<	0.500 pCi/g		
Europium-154	<	0.200 pCi/g		
Europium-155	<	0.200 pCi/g		
Lead-212	<	1.00 pCi/g		
Manganese-54	<	0.100 pCi/g		
Potassium-40		4.21 pCi/g		
Promethium-144	<	0.100 pCi/g		
Promethium-146	<	0.100 pCi/g		
Ruthenium-106	<	0.800 pCi/g		
Sodium-22	<	0.700 pCi/g		
Thorium-234	<	5.00 pCi/g		
Yttrium-88	<	0.100 pCi/g		
Zinc-65	<	0.200 pCi/g		
Carbon-14 - 2 item:	5			
Accuracy, Carbon-1	14	2.53 pCi/g	HASL 300	WBS 05/13/93 0247
		Prop bong	ANTON JOH	W D3 03/13/93 0247

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Sample ID

: FDA-TP-2

Parameter	Qualifier	Result Units	Method	Analyst	Date	Time
Carbon-14	<	20.0 pCi/g				
Radium-226 - 2 items Accuracy, Radium-226 Radium-226	<	0.105 pCi/g 1.00 pCi/g	EPA 903	MDS	05/03/93	0714
Radium-228 - 2 items Accuracy, Radium-228 Radium-228	<	0.162 pCi/g 1.00 pCi/g	EPA 904.0	MDS	05/03/93	0714
Radon-222 - 2 items Accuracy, Radon-222 Radon-222	<	0.396 pCi/g 1.00 pCi/g	HASL 300	MDS	04/26/93	1336
Tritium - 2 items Accuracy, Tritium Tritium	<	4.74 pCi/g 2.00 pCi/g	EPA 906.0 modified	ADW	04/23/93	1745

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Contact:

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 Sample ID
 : FDA-TP-3

 Lab ID
 : 9304367-02

 Matrix
 : Soil

 Date Collected
 : 04/08/93

 Date Received
 : 04/20/93

 Priority
 : Routine

Qualifier Result Units Method Analyst Date Time Parameter Radiological Gross Alpha - 3 items 04/28/93 0854 Accuracy, Gross Alpha CWS 3.61 pCi/g Gross Alpha 9.46 pCi/g Weight of Sample, A&B 20.3 mg Nonvolatile Beta - 3 items Accuracy, Nonvolatile Beta 3.21 pCi/g Nonvolatile Beta 14.8 pCi/g Weight of Sample, A&B 20.3 mg Alpha Spectroscopy Thorium - o items 0045 Accuracy, Thorium-228 0.00 pCi/g HASL 300 AHT 05/19/93 Accuracy, Thorium-230 0.346 pCi/g Accuracy, Thorium-232 0.369 pCi/g Thorium-228 0.200 pCi/g Thorium-230 0.631 pCl/g Thorium-232 0.710 pCi/g Alpha Spectroscopy Uranium - 6 items HASL 300 Accuracy, Uranium-233/234 0.136 pCl/g AHT 05/12/93 1813 Accuracy, Uranium-235 0.0299 pCi/g Accuracy, Uranium-238 0.137 pCi/g Uranium-233/234 0.700 pCi/g Uranium-235 0.500 pCi/g Uranium-238 0.711 pCi/g Gamma PHA - 40 items Accuracy, Actinium-228 0.222 pCi/g HASL 300 MDS 05/03/93 0715 Accuracy, Antimony-125 0.00 pCi/g Accuracy, Cerium-144 0.00 pCi/g Accuracy, Cesium-134 0.00 pCi/g Accuracy, Cesium-137 0.00 pCi/g Accuracy, Cobalt-57 0.00 pCi/g

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Sample ID		: FDA-TP-	3	
Parameter Qualif	ier	Result Units	Method	Analyst Date Tim
Accuracy, Cobalt-60		0.00 pCi/g		
Accuracy, Europium-152		0.00 pCi/g	HASL 300	MDS 05/03/93 071
Accuracy, Europium-154		0.00 pCi/g		
Accuracy, Europium-155		0.00 pCi/g		
Accuracy, I ead-212		0.0740 pCi/g		
Accuracy, Manganese-54		- 0.00 pCi/g		
Accuracy, Potassium-40		0.761 pCl/g		
Accuracy, Promethium-144		0.00 pCi/g		
Accuracy, Promethium-146		0.00 pCi/g		
Accuracy, Ruthenium-106		0.00 pCi/g		
Accuracy, Sodium-22		0.00 pCi/g		
Accuracy, Thorium-234		1.22 pCi/g		
Accuracy, Yttrium-88		0.00 pCi/g		
Accuracy, Zinc-65		0.00 pCi/g		
Actinium-228	<	1.00 pCi/g		
Antimony-125	<	0.200 pCi/g		
Cerium-144	<	0.500 pCi/g		
Cesium-134	<	0.100 pCi/g		
Cesium-137	<	0.100 pCi/g		
Cobalt-57	<	0.100 pCi/g		
Cobalt-60	<	0.100 pCi/g		
Europium-152	<	0.500 pCi/g		
Europium-154	<	0.200 pCi/g		
Europium-155	<	0.200 pCi/g		
Lead-212	<	1.00 pCl/g		
Manganese-54	<	0.100 pCi/g		
Potassium-40		6.43 pCi/g		
Promethium-144	<	0.100 pCi/g		
Promethium-146	<	0.100 pCi/g		
Ruthenium-106	<	0.800 pCi/g		
Sodium-22	<	0.700 pCi/g		
Thorium-234	<	5.00 pCi/g		
Yttrium-88	<	0.100 pCi/g		
Zinc-65	<	0.200 pCi/g		
Carbon-14 - 2 items				

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Sample ID

: FDA-TP-3

Parameter	Qualifier	Result	Units	Method	Analyst	Date	Time
Carbon-14	<	20.0	pCi/g				
Radium-226 - 2 items							
Accuracy, Radium-226		0.136	pCi/g	EPA 903	MDS	05/03/93	0715
Radium-226	<	1.00	pCi/g				
Radium-228 - 2 items							
Accuracy, Radium-228		. 0.222	pCi/g	EPA 904.0	MDS	05/03/93	0715
Radium-228	<	1.00	pCi/g				
Radon-222 - 2 items							
Accuracy, Radon-222		0.611	pCi/g	HASL 300	MDS	04/26/93	0714
Radon-222	<	1.00	pCi/g				
Tritium - 2 items							
Accuracy, Tritium		4.98	pCi/g	EPA 906.0 modified	ADW	04/23/93	1830
Tritium	<		pCi/g				

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FL	E\$7156/8729
NC	2.3
SC	1012
TN	0293
VA	0015
WI	9998877

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Page 1 of 3

Sample ID : FDA-TP-4
Lab ID : 9304367-03
Matrix : Soil
Date Collected : 04/09/93
Date Received : 04/20/93
Priority : Routine
Collector : Client

Parameter	Qualifier	Result Units	Method	Analyst	Date	Time
Radiological						-
Gross Alpha - 3 items						
Accuracy, Gross Alpha		4.77 pCVg		CWS	04/28/93	142
Gross Alpha		18.2 pCi/g				
Weight of Sample, A&F	3	24.6 mg				
Nonvolatile Beta - 3 iter						
Accuracy, Nonvolatile I	Beta	3.06 pCi/g				
Nonvolatile Beta		13.6 pCi/g				
Weight of Sample, A&I	3	24.6 mg				
Alpha Spectroscopy Tho						
Accuracy, Thorium-228		0.00 pCi/g	HASL 300	AHT	05/16/93	121
Accuracy, Thorium-230		0.00 pCi/g				
Accuracy, Thorium-232		0.272 pCi/g				
Thorium-228	<	0.200 pCi/g				
Thorium-230	<	0.200 pCi/g				
Thorium-232		0.857 pCi/g				
Alpha Spectroscopy Ura	anium - 6 items					
Accuracy, Uranium-233		0.134 pCi/g	HASL 300	AHT	05/12/93	181
Accuracy, Uranium-235	5	0.0308 pCi/g				
Accuracy, Uranium-238	3	0.136 pCi/g				
Uranium-233/234		0.669 pCi/g				
Uranium-235	<	0.500 pCi/g				
Uranium-238		0.698 pCi/g				
Gamma PHA - 40 items	5					
Accuracy, Actinium-22	.8	0.244 pCi/g	HASL 300	MDS	05/03/93	093
Accuracy, Antimony-12		0.00 pCi/g				
Accuracy, Cerium-144		0.00 pCi/g				
Accuracy, Cesium-134		0.00 pCi/g				
Accuracy, Cesium-137		0.00 pCi/g				
Accuracy, Cobalt-57		0.00 pCi/g				

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Parameter	Qualifier	Result Units	Method	Analyst	Date	Time
Accuracy, Cobalt-60)	0.00 pCi/g				
Accuracy, Europium		0.00 pCi/g	HASL 300	MDS	05/03/93	0931
Accuracy, Europium		0.00 pCi/g				
Accuracy, Europium	1-155	0.00 pCi/g				
Accuracy, Lead-212		0.0872 pCi/g				
Accuracy, Mangane	se-54	8.15 pCi/g				-
Accuracy, Potassiun	1-40	1.13 pCi/g				
Accuracy, Promethi	urn-144	0.00 pCi/g				
Accuracy, Promethi		0.00 pCi/g				
Accuracy, Ruthenius	m-106	0.00 pCi/g				
Accuracy, Sodium-2		0.00 pCi/g				
Accuracy, Thorium-	234	3.00 pCi/g				
Accuracy, Yttrium-8	38	0.00 pCi/g				
Accuracy, Zinc-65		0.00 pCi/g				
Actinium-228	<	1.00 pCi/g				
Antimony-125	<	0.200 pCi/g				
Cerium-144	<	0.500 pCi/g				
Cesium-134	<	0.100 pCi/g				
Cesium-137	<	0.100 pCi/g				
Cobalt-57	<	0.100 pCi/g				
Cobalt-60	<	0.100 pCi/g				
Europium-152	<	0.500 pCi/g				
Europium-154	<	0.200 pCi/g				
Europium-155	<	0.200 pCi/g				
Lead-212	<	1.00 pCi/g				
Manganese-54	<	0.100 pCi/g				
Potassium-40		1.13 pCi/g				
Promethium-144	<	0.100 pCi/g				
Promethium-146	<	0.100 pCi/g				
Ruthenium-106	<	0.800 pCi/g				
Sodium-22	<	0.700 pCi/g				
Thorium-234	<	5.00 pCi/g				
Yttrium-88	<	0.100 pCi/g				
Zinc-65	<	0.200 pCi/g				
Carbon-14 - 2 items		area bong				
Accuracy, Carbon-1		2.93 pCi/g	HASL 300	WBS	05/13/93	0347

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80	175 MIN	15-875	276	-10	1.3
- 23	20.11	10	150	4.	Sec.
-		15.			

: FDA-TP-4

Parameter	Qualifier	Result Units	Method	Analyst	Date	Time
3 83 84110304	Z married			Carried and an arrangement of the contract of		
Carbon-14	<	20.0 pCi/g				
Radium-226 - 2 items						
Accuracy, Radium-226		0.120 pCi/g	EPA 903	MDS	05/03/93	0931
Radium-226	<	1.00 pCi/g				
Radium-228 - 2 items						
Accuracy, Radium-228		0.243 pCi/g	EPA 904.0	MDS	05/03/93	0931
Radium-228	<	The second secon				-
Radon-222 - 2 items						
Accuracy, Radon-222		0.607 pCi/g	HASL 300	MDS	04/26/93	0935
Radon-222		1.00 pCi/g				
Tritium - 2 items		Tion hous				
Accuracy, Tritium		4.42 pCi/g	EPA 906.0 modified	ADW	04/23/93	1915
Tritium	<	2.00 pCi/g	as it soon mounted			

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IC .	23
C	1012
N	0293
A	0015
VI	9998877

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Contact:

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Sample ID Lab ID

1 460 1 01

Lab ID Matrix : FDA-TP-5 : 9304367-04

Matrix
Date Collected

: Soil : 04/13/93

Date Received

: 04/20/93 : Routine

Priority Collector

: Client

Parameter	Qualifier	Result Units	Method	Analyst	Date	Ŧim
Radiological			10 - 11 - 11 - 11 - 11 - 11 - 11 - 11 -			-
Gross Alpha - 3 items						
Accuracy, Gross Alpl	ha	3.21 pCi/g		CWS	04/28/93	1213
Gross Alpha		7.12 pCi/g			0.4120122	141
Weight of Sample, A		22.5 mg				
Nonvolatile Beta - 3 i	tems					
Accuracy, Nonvolatil	e Beta	2.57 pCi/g				
Nonvolatile Beta		6.46 pCi/g				
Weight of Sample, A.	&B	22.5 mg				
Alpha Spectroscopy T	horium - 6 items					
Accuracy, Thorium-2	28	0.128 pCi/g	HASL 300	AHT	05/16/93	1210
Accuracy, Thorium-2	30	0.295 pCi/g		751.1.1	02/10/93	1210
Accuracy, Thorium-2	32	0.123 pCi/g				
Thorium-228		0.477 pCi/g				
Thorium-230		1.82 pCi/g				
Thorium-232		0.447 pCi/g				
Alpha Spectroscopy U	Iranium - 6 items					
Accuracy, Uranium-2	33/234	0.132 pCi/g	HASL 300	AHT	05/12/93	1813
Accuracy, Uranium-2	35	0.00 pCi/g		754.1.1	00114170	1012
Accuracy, Uranium-2	38	0.139 pCi/g				
Uranium-233/234		0.581 pCi/g				
Uranium-235	<	0.500 pCi/g				
Uranium-238		0.636 pCi/g				
Gamma PHA - 40 iten	71.5					
Accuracy, Actinium-2	228	0.187 pCi/g	HASL 300	MDS	05/03/93	0933
Accuracy, Antimony-	125	0.00 pCi/g		11120	02/03/73	0933
Accuracy, Cerium-14-	4	0.00 pCi/g				
Accuracy, Cesium-13-	4	0.00 pCi/g				
Accuracy, Cesium- 3	7	0.00 pCi/g				
Accuracy, Cobalt-57		0.00 pCi/g				



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Westmont, Illinois 60559

Contact:

Ms. Cathy Hall

PCFN00193

Report Date: June 03, 1993

	Sample ID	: FDA-TP-5			Time
Parameter	Qualifier	Result Units	Method	Analyst Date	1 ime
Accuracy, Cobalt-6	50	0.00 pCi/g		MDS 05/03/93	0933
Accuracy, Europiu	m-152	0.00 pCi/g	HASL 300	14,00	
Accuracy, Europiu	m-154	0.00 pCi/g			
Accuracy, Europiu	rm 155	0.00 pCVg			
Accuracy, Europiu	12	0.0795 pCi/g			
Accuracy, Lead-21	nece 54	0.00 pCi/g			
Accuracy, Mangar	1050-24	0.489 pCi/g			
Accuracy, Potassii	hirm 144	0.00 pCi/g			
Accuracy, Promet	him 146	0.00 pCi/g			
Accuracy, Promet	nium-140	0.00 pCi/g			
Accuracy, Ruthen	10m-100	0.00 pCVg			
Accuracy, Sodium	1-22	1.12 pCi/g			
Accuracy, Thorius	m-234	0.00 pCi/g			
Accuracy, Yttriun	n-88	0.00 pCi/g			
Accuracy, Zinc-6	>	1.00 pCi/g			
Actinium-228	<	0.200 pCi/g			
Antimony-125	2	0.500 pCi/g			
Cerium-144	<	0.100 pCi/g			
Cesium-134	<	0.100 pCi/g			
Cesium-137		0.100 pCi/g			
Cobalt-57	<	0.100 pCi/g			
Cobalt-60	<	0.500 pCi/g			
Europium-152	<	0.200 pCi/g			
Europium-154	<	0 000 -01/-			
Europium-155	<	1 nn - m:/-			
Lead-212	<	0.100 011			
Manganese-54	<	1.37 pCi/g			
Potassium-40		0.100 -011-			
Promethium-144		0.100 -011-			
Promethium-146					
Ruthenium-106					
Sodium-22	*	6.00 -01/-			
Thorium-234					
Yttrium-88	×	0.100 pCi/g			
Zinc-65		0.200 pCi/g			
Carbon-14 - 2 i	tems		HASL 300	WBS 05/13	3/93 0
Accuracy, Carb	xon-14	1.42 pCi/g	HASL SW		

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Report Date: June 03, 1993

Page 3 of 3

Sample ID

: FDA-TP-5

Parameter	Qualifier	Result Units	Method	Analyst	Date	Time
Carbon-14 Radium-226 - 2 items	<	20.0 pCi/g				
Accuracy, Radium-226 Radium-226 Radium-228 - 2 items	<	0.107 pCi/g 1.00 pCi/g	EPA 903	MDS	05/03/93	0933
Accuracy, Radium-228 Radium-228 Radon-222 - 2 items	<	0.187 pCi/g 1.00 pCi/g	EPA 904.0	MDS	05/03/93	-0933
Accuracy, Radon-222 Radon-222 Tritium - 2 items	<	0.334 pCi/g 1.00 pCi/g	HASL 300	MDS	04/26/93	0936
Accuracy, Tritium Tritium	<	4.78 pCi/g 2.00 pCi/g	EPA 906.0 modified	ADW	04/23/93	2000

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Page 1 of 3

Sample ID

: FDA-TP-6

Lab ID

: 9304367-05

Matrix

: Soil

Date Collected

: 04/13/93

Date Received Priority

: 04/20/93

Collector

: Routine : Client

Parameter	Qualifier	Result Units	Method	Analyst	Date	Time
liological						-
Gross Alpha - 3 items						
Accuracy, Gross Alph		2.35 pCi/g		CWS	04/25/93	021
Gross Alpha		9.21 pCi/g				
Weight of Sample, Ad	&B	11.4 mg				
Nonvolatile Beia - 3 ii						
Accuracy, Nonvolatile	Beta	1.82 pCi/g				
Nonvolatile Beta		6.76 pCi/g				
Weight of Sample, Ad	&B	11.4 mg				
Alpha Spectroscopy T						
Accuracy, Thorium-2		0.00 pCi/g	HASL 300	AHT	05/16/93	080
Accuracy, Thorium-2		0.190 pCi/g				
Accuracy, Thorium-2		0.123 pCi/g				
Thorium-228	<	0.200 pCi/g				
Thorium-230		0.972 pCi/g				
Thorium-232		0.479 pCVg				
Alpha Spectroscopy U	Tranium - 6 item					
Accuracy, Uranium-2		0.186 pCi/g	HASL 300	AHT	05/12/93	181
Accuracy, Uranium-2	35	0.0447 pCi/g				
Accuracy, Uranium-2		0.189 pCi/g				
Uranium-233/234		0.890 pCi/g				
Uranium-235	<	0.500 pCi/g				
Uranium-238		0.936 pCi/g				
Gamma PHA - 40 ites	71.5	10				
Accuracy, Actinium-		0.137 pCi/g	HASL 300	MDS	05/03/93	121
Accuracy, Antimony-		0.00 pCi/g				
Accuracy, Cerium-14		0.00 pCi/g				
Accuracy, Cesium-13		0.00 pCi/g				
Accuracy, Cesium-13		0.00 pCi/g				
Accuracy, Cobalt-57		0.00 pCi/g				

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Report Date: June 03, 1993

	Sample ID	: FDA-TI	2-6			
Parameter	Qualifier	Result Units	Method	Analyst	Date	Tim
Accuracy, Cobalt-	60	0.00 pCi/g		*		
Accuracy, Europiu	m-152	0.00 pCi/g	HASL 300	1000	ornana	
Accuracy, Europiu	m-154	0.00 pCi/g	11131 300	MDS	05/03/93	121
Accuracy, Europiu	m-155	0.00 pCi/g				
Accuracy, Lead-21		0.0622 pCi/g				
Accuracy, Mangan		0.00 pCi/g				
Accuracy, Potassiu		0.513 pCi/g				-
Accuracy, Prometh	iium-144	0.00 pCi/g				
Accuracy, Prometh	ium-146	0.00 pCi/g				
Accuracy, Ruthenii	um-106	0.00 pCi/g				
Accuracy, Sodium-	22	0.00 pCi/g				
Accuracy, Thorium	1-234	5.99 pCi/g				
Accuracy, Yttrium-	-88	0.00 pCi/g				
Accuracy, Zinc-65		0.00 pCi/g				
Actinium-228	<	1.00 pCi/g				
Antimony-125	<	0.200 pCi/g				
Cerium-144	<	0.500 pCi/g				
Cesium-134	<	0.100 pCi/g				
Cesium-137	<	0.100 pCi/g				
Cobalt-57	<	0.100 pCi/g				
Cobalt-60	<	0.100 pCi/g				
Europium-152	<	0.500 pCVg				
Europium-154	<	0.200 pCi/g				
Europium-155	<	0.200 pCi/g				
Lead-212	<	1.00 pCi/g				
Manganese-54	<	0.100 pCi/g				
Potassium-40		2.03 pCi/g				
Promethium-144	<	0.100 pCi/g				
Promethium-146	<	0.100 pCi/g				
Ruthenium-106	<	0.800 pCi/g				
Sodium-22	<	0.700 pCi/g				
Thorium-234	<	5.00 pCi/g				
Yttrium-88	<	0.100 pCi/g				
Zinc-65	<	0.200 pCi/g				
Carbon-14 - 2 items		orano benk				
Accuracy, Carbon-1		1.92 pCi/g	11463 200			
,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		1.92 PCA8	HASL 300	WBS 05	5/13/93	0447

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Sa	imple ID	: FDA-TP	-6			
Parameter	Qualifier	Result Units	Method	Annly		
Carbon-14 Radium-226 - 2 items	<	20.0 pCi/g		Analy	st Date	Time
Accuracy, Radium-226 Radium-226 Radium-228 - 2 items	<	0.0961 pCi/g 1.00 pCi/g	EPA 903	MDS	05/03/93	1213
Accuracy, Radium-228 Radium-228 Radon-222 - 2 items	<	0.137 pCi/g 1.00 pCi/g	EPA 904.0	MDS	05/03/93	1213
Accuracy, Radon-222 Radon-222 Tritium - 2 items	<	0.244 pCi/g 1.00 pCi/g	HASL 300	MDS	04/26/93	1144
Accuracy, Tritium Tritium	<	4.05 pCi/g 2.00 pCi/g	EPA 906.0 modified	ADW	04/23/93	2045

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Report Date: June 03, 1993

Page 1 of 3

Sample ID

Lab ID

: FDA-TP-8 : 9304312-12

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au ix

: Soil

te Collected

: 04/13/93

Late Received

: 04/16/93

Priority

: Routine

Collector

: Client

Parameter	Qualifier	Result Units	Method	Analyst	Date	Time
Radiological					No. of the Control of the Control of the	
Gross Alpha - 3 items						
Accuracy, Gross Alpha		1.13 pCi/g		CWS	04/23/93	1023
Gross Alpha	<	5.00 pCi/g				
Weight of Sample, A&I	3	4.30 mg				
Nonvolatile Beta - 3 iter	TLS					
Accuracy, Nonvolatile I	Beta	1.43 pCi/g				
Nonvolatile Beta	<	5.00 pCi/g				
Weight of Sample, A&I	3	4.30 mg				
Gamma PHA - 40 items						
Accuracy, Actinium-228	3	0.00 pCi/g	HASL 300	MDS	04/30/93	1437
Accuracy, Antimony-12	5	0.00 pCi/g				
Accuracy, Cerium-144		0.00 pCi/g				
Accuracy, Cesium-134		0.00 pCi/g				
Accuracy, Cesium-137		0.00 pCi/g				
Accuracy, Cobalt-57		0.00 pCi/g				
Accuracy, Cobalt-60		0.00 pCi/g				
Accuracy, Europium-15	2	0.00 pCi/g				
Accuracy, Europium-15	4	0.00 pCi/g				
Accuracy, Europium-15	5	0.00 pCi/g				
Accuracy, Lead-212		0.0567 pCi/g				
Accuracy, Manganese-5	4	0.00 pCi/g				
Accuracy, Potassium-40		0.298 pCi/g				
Accuracy, Promethium-	144	0.00 pCi/g				
Accuracy, Promethium-	146	0.00 pCi/g				
Accuracy, Ruthenium-1	06	0.00 pCi/g				
Accuracy, Sodium-22		0.00 pCi/g				
Accuracy, Thorium-234		1.92 pCi/g				
Accuracy, Yttrium-88		0.00 pCi/g				
Accuracy, Zinc-65		0.00 pCi/g				

9304312-12

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	Sample ID	: FDA-TP	8			
Parameter	Qualifier	Result Units	Method	Analyst	Date	Time
Actinium-228	<	1.00 pCi/g				
Antimony-125	<	0.200 pCi/g	HASL 300	MDS	04/30/93	1437
Cerium-144	<	0.500 pCi/g				
Cesium-134	<	0.100 pCi/g				
Cesium-137	<	0.100 pCi/g				
Cobalt-57	<	0.100 pCi/g				- 500
Cobalt-60	<	0.100 pCi/g				
Europium-152	<	0.500 pCi/g				
Europium-154	<	0.200 pCi/g				
Europium-155	<	0.200 pCi/g				
Lead-212	<	1.00 pCi/g				
Manganese-54	<	0.100 pCi/g				
Potassium-40	<	1.00 pCi/g				
Promethium-144	<	0.100 pCi/g				
Promethium-146	<	0.100 pCi/g				
Ruthenium-106	<	0.800 pCi/g				
Sodium-22	<	0.700 pCi/g				
Thorium-234	<	5.00 pCi/g				
Yttrium-88	<	0.100 pCl/g				
Zinc-65	<	0.200 pCi/g				
Carbon-14 - 2 items						
Accuracy, Carbon-1	4	8.39 pCi/g	HASL 300	WBS	05/06/93	1425
Carbon-14	<	20.0 pCi/g				
Radon-222 - 2 items						
Accuracy, Radon-22	22	0.0736 pCi/g	HASL 300	MDS	04/23/93	1420
Radon-222	<	1.00 pCi/g				
Tritium - 2 items						
Accuracy, Tritium		4.26 pCi/g	EPA 906.0 modified	ADW	04/22/93	1800
Tritium	<	2.00 pCi/g				

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Ms. Cathy Hall

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Sample ID

: FDA-TP-8

NOSTY

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Parameter

Qualifier

Result Units

Method

Analyst

Date

Time

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Page 1 of 3

Sample ID : FDA-TP-13
Lab ID : 9304422-03
Matrix : Soil
Date Collected : 04/13/93
Date Received : 04/22/93
Priority : Routine
Collector : Client

Parameter	Qualifier	Result Units	Method	Analyst	Date	Time
tadiological						
Gross Alpha - 3 items						
Accuracy, Gross Alpha		1.86 pCi/g		CWS	04/27/93	1230
Gross Alpha		5.30 pCi/g				
Weight of Sample, A&B		5.10 mg				
Nonvolatile Beta - 3 iten	1.5					
Accuracy, Nonvolatile B	eta	1.79 pCi/g				
Nonvolatile Beta	<	5.00 pCi/g				
Weight of Sample, A&B		5.10 mg				
Alpha Spectroscopy Tho	rium - 6 items					
Accuracy, Thorium-228		0.00 pCi/g	HASL 300	AHT	05/18/93	1739
Accuracy, Thorium-230		0.175 pCi/g				
Accuracy, Thorium-232		0.184 pCi/g				
Thorium-228	<	0.200 pCi/g				
Thorium-230		0.350 pCi/g				
Thorium-232		0.401 pCi/g				
Alpha Spectroscopy Ura	nium - 6 items					
Accuracy, Uranium-233/	234	0.174 pCi/g	HASL 300	AHT	05/26/93	0041
Accuracy, Uranium-235		0.0428 pCi/g				
Accuracy, Uranium-238		0.131 pCi/g				
Uranium-233/234		0.456 pCi/g				
Uranium-235	<	0.500 pCi/g				
Uranium-238		0.274 pCi/g				
Gamma PHA - 40 items						
Accuracy, Actinium-228		0.130 pCi/g	HASL 300	MDS	04/27/93	2003
Accuracy, Antimony-12:	5	0.00 pCi/g				
Accuracy, Cerium-144		0.00 pCi/g				
Accuracy, Cesium-134		0.00 pCi/g				
Accuracy, Cesium-137		0.00 pCi/g				
Accuracy, Cobalt-57		0.00 pCi/g				

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S	ample ID	: FDA-TP	-13		
Parameter	Qualifier	Result Units	Method	Analyst	Date Tim
Accuracy, Cobalt-60		0.00 pCi/g			
Accuracy, Europium-1:	52	0.00 pCi/g	HASL 300	MDS 0	4/27/93 200.
Accuracy, Europium-1:		0.00 pCi/g			
Accuracy, Europium-1:	55	0.00 pCi/g			
Accuracy, Lead-212		0.0538 pCi/g			
Accuracy, Manganese-	54	0.00 pCi/g			
Accuracy, Potassium-4	0	0.410 pCi/g			
Accuracy, Promethium.	-144	0.00 pCi/g			
Accuracy, Promethium	-146	0.00 pCi/g			
Accuracy, Ruthenium-	106	0.00 pCi/g			
Accuracy, Sodium-22		0.00 pCi/g			
Accuracy, Thorium-234	4	1.14 pCi/g			
Accuracy, Yttrium-88		0.00 pCi/g			
Accuracy, Zinc-65		0.00 pCi/g			
Actinium-228	<	1.00 pCi/g			
Antimony-125	<	0.200 pCi/g			
Cerium-144	<	0.500 pCi/g			
Cesium-134	<	0.100 pCi/g			
Cesium-137	<	0.100 pCi/g			
Cobalt-57	<	0.100 pCi/g			
Cobalt-60	<	0.100 pCi/g			
Europium-152	<	0.500 pCi/g			
Europium-154	<	0.200 pC1/g			
Europium-155	<	0.200 pCi/g			
Lead-212	<	1.00 pCi/g			
Manganese-54	<	0.100 pCi/g			
Potassium-40	<	1.00 pCi/g			
Promethium-144	<	0.100 pCi/g			
Promethium-146	<	0.100 pCi/g			
Ruthenium-106	<	0.800 pCi/g			
Sodium-22	<	0.700 pCi/g			
Thorium-234	<	5.00 pCl/g			
Yttrium-88	<	0.100 pCi/g			
Zinc-65	<	0.200 pCi/g			
Carbon-14 - 2 items					
Accuracy, Carbon-14		4.46 pCi/g	HASL 300	WBS 05	5/13/93 1235

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cc: PCFN00193

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Sa	mple ID	: FDA-MV	V-13			
Parameter	Qualifier	Result Units	Method	Analyst	Date	Time
Carbon-14	<	200 pCi/L				
Radium-226 - 2 items						
Accuracy, Redium-226		0.370 pCi/L	EPA 903	ADW	05/18/93	1525
Radium-226	<	1.00 pCi/L		UDA	03/10/93	1040
Radium-228 - 2 items						
Accuracy, Radium-228		0.900 pCi/L	EPA 904.0	RLM	05/18/93	794 3 71
Radium-228	<	1.00 pCi/L	11 70 7,0	Polis VI	03/19/33	2137
Radon-222 - 2 items						
Accuracy, Radon-222		71.6 pCi/L	HASL 300	MDS	05/12/93	1901
Radon-222		380 pCVL	121010	MIND	U2/12/93	1901
Tritium - 2 items						
Accuracy, Tritium		0.200 pCi/mL	EPA 906.0	MDS	05/12/02	1220
Tritium	<	0.700 pCi/mL		MILIO	05/12/93	1229
		To the second				

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Charleston, South Carolina 29417 8013, 556, 8171 Page | of

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803-556-8171	() se F or P in the boses to indicate whether 4— sample was filtered and or preserved.	Remarks		Screening	Ell avalysis	Screening	Screening	Full analysis	Full analysis								line. Received by:	
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			SAMPLEID	FDA-MW-3 4-15-93 1055	FDA-MW-6 4+13-93	1-4-44	FDA-TP-8 "	H-12-44	S-85-KAL								- recinquished by:	Retinquished by:

White - sample collector Yellow - file Pink - with report

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Page \ of \

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Pacific Nui	clear/ G	00			r		H	II	1	I	L	1	UB-C PC	CHART JU	area (o spec	ly ape	Cific o	Ompos	inds o	r method		Use For I	P in the boxes to indicate whether as filtered and or preserved
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SAMPLE ID	DATE	TIME	WELL SOIL	CRAB	* of	pH, conductivity	7007	TOX	Chlonde, Suffice	NicritorNicrate	VOC - Specify Mathod required	METALS - specif	Practicide	Horbicide	Total Phonol	Acid Extractable	BAN Extractabl	K3:	Cymanide	Coliforns .	RADIOACIVITY	N	DS	Remarks
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CHAIN OF CUSTODY RECORD

Page of

General Engineering Laboratories 2040 Savage Road Charleston, South Carolina 29414 PO Box 30712 Charleston, South Carolina 29417

Chent Name / Facility Name			With Albertaine	DENGLISHINGS:	7	1	ANTIN	-	A 1 1000	C D		Contractor	· Characterist	WINDS NO.	-	-	-	-		-	No.		803-556-8171
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SAMPLE ID	DATE	TIME	WEIL SOU.	COMP		pH, cond	TOC / 1	XOT	Chloride, Fluono Sulfate	Mitria/Nitrate	VOC - Specify Method required	METALS - specif	Pesticide	Hertscids	Total Phenol	Acid Extractab	B/N Extractables	PCB's	Cymrade	Coulorm	PENNAMA	No vote la	MDS Remarks
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General Engineering Laboratories 2040 Savage Road Charleston, South Carolina 29414 PO Box 30712 Charleston, South Carolina 29417

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SAMPLE ID	DATE	TIME	WELL	SOLL	9	# of contai	TOC / DOC	XOT	Chloride, Pluoride, Suffixe	Nitrite/Nitrate	VOC - Specify Method required	METALS -specif	Phyticide	Herbicide	Total Phenol	Acid Extractables	B/N Extractables	KBi	Cy sent de	Coliform - specify type	RADOKTIV IT	MDS Remarks
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CHAIN OF CUSTODY RECORD

General Engineering Laboratories 2040 Savage Road Charleston, South Carolina 29414 PO Box 30712 Charleston, South Carolina 29417

Page | of | 803-556-8171 Client Name / Facility Name SAMPLE ANALYSIS REQUIRED(x) - use remarks area to specify specific compounds or methods Use F or P in the boxes to indicate whether Pacific Nuclear / 600 4 sample was filtered and/or preserved containers NOTE: All 1/2 gal. containers presented w/ HNO2 A. Bianutses/GTS 'io SAMPLE ID DATE TIME Remarks FDA-MW-3 4-27-93 1745 Screening FDA-MW-30 4-27-93 1755 5 X screening FLA-MW-4 4-27-13 1805 F screening FDA-SB-9 4-28-93 1330 Full analysis 1862 X Relesquished by: Received by: Relinquished by: Received by: 0845 Remarks White . sam ·-- llector

ATTACHMENT 2

ROUTINE KADIATION SURVEYS

ECOLO	GY SERVICES	S, INC.	COMPANY NAME TO
RADIATION	SAFETY SURVEY		BLDG ROOM NO.
AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE	12-29-92
SURVEYOR	NAME (last, first initial)	PHONE	SURVEY METER USED
	1 H 6	SINU VI	MPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION
BEZOH	RFR 7 TBL 7 S INCU 4	BATH FZR	(1) Signs & lables: room (2) Source containers (3) Refrigerator/freezer (4) LSC vials (5) Waste containers (6) Other equipment (7) Absorbant paper (on radionuclide use areas) (8) Adequate hood flow (9) Hood air flow in calibration (10) Adequate personnel external monitoring (11) Radioactive waste management (12) Adequate radionuclide storage (13) Routine use of gloves (14) Routine use of lab coals (15) Shielding, if required (16) Prohibition of eating, drinking, and smoking (17) Inventory/disposal records (18) Survey records current (19) Personnel trained (20) Prohibition on mouth pipetting
SMEAR RESULTS		s) down the	(21) Comidor storage meets require- ments (22) Radiation levels < 2.5 mR/hr (23) Contamination (smears)
LOCATION 1	2 3 4 5 6 7	8 9 10	< 100 dpm (24) Calibration current
NUCLIDES 14 <10			(25) Survey meters operational (26) Survey meters available (27) Other (SPECIFY IN REMARKS
NUCLIDE 2		М	ETER 1 METER 2 METER 3
NUCLIDE 3			

ECOLO)G	Y	SE	RV	IC	E	5,	IN	C.	1	OMP/	ANY	NAMES	1-1	sA.	
RADIATION	I SA	AFET	Υ	SUR	VEY	1				-	BLDG ₍	F	38	R00	M NO. 756	
AUTHORIZED INVESTIGATOR	N	AME (last, fir	at initie	BJ)				PHO	DNE	10.		DATEIN	nonth,	day, year)
SURVEYOR	N	AME (WAT	last, fir		al)				PHO	ONE 1	10.	WARDAW.	SURVEY L3	MET	ER USED	
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							9			1	(6) O (7) A	ther bsor use	equipm	ent per (o	n radionu	olide
-					(0						(10)	Ade m Rad	onit oring loactive	ers onr waste	bration nel extern managem clide store	ent
5-2X)	(2	<i>y y</i>	7				45.0	NEUS Er		(13) (14) (15) (16) (17)	Rou Shi Pro an	itine use itine use elding, if hibition of d smokir entory/d	of gl of lal requi of eating ispose	oves b coals ired ng, drinki d records	
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NUCLIDE 3											SCHOOL VERNING	out annual	Mary Constitution of the C	ONLY THE RESERVE		NA THURST PERSONS

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Rev. Oct 1990

RADIATION SAFETY SURVEY AUTHORIZED INAME (last, first initial) INYESTIGATOR NAME (last, first initial) PHONE NO. DATE (month, day, your containers) SURVEYOR NAME (last, first initial) PHONE NO. SURVEY METER US COMPLIANCE ITEMS Y=COMPL N=VIOLAT Y X (1) Signs & lables : room (2) Source containers (3) Refrigerator/Ireezer RATH (4) LSC vials (5) Waste containers (6) Other equipment (7) Absorbant paper (on radiuses areas) (8) Adequate hood flow (9) Hood sir flow in calibration (10) Adequate personnel ex monitoring (11) Radioactive waste mans (12) Adequate radionuclide: (13) Routine use of gloves (14) Routine use of gloves (14) Routine use of lab cost	year) 172 SED
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NUCLIDE 1 (26) Survey meters available (27) Other (SPECIFY IN RE	е
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CAB UNAVAILABLE FOR SURVEY

AUTHORIZED NAME (last, first initial) NAME (last, first initial) SURVEYOR NAME (last, first initial) PHONE NO. DATE (month, day, year) 12-29-92 NAME (last, first initial) PHONE NO. SURVEY METER USED NAME	RADIATION	SAFE	ry s	URVEY			BLDG	RX	6846
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	GY		THE PART CHARLES AND THE PARTY.	Manage Service		-		BLDG	50~	ROOM NO.
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AUTHORIZED INVESTIGATOR	1 X SAVIE	(1001) (110)	i ii iicida j	and the second second second			FIIO	140.	12	-29-92
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RADIATION	SAFE	TY SUF	RVEY					BLDG C	B8		DM NO.	2
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with 5				7				(8) Ade	equate ho			
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NUCLIDE 3												and the second second second

ECOLOGY SERVICES, INC. 300 Second St., Laurel, Maryland 201. (301) 498-1514	Compa	any Name:	E DA	
RADIATION SAFE	ETY SURVE	Y	Building /	BRF/LAB 18
Authorized Investigator: NAME:			Phone No.	Date: 12-29-92
Surveyor: NAME:	5, C		Phone No.	Survey Meter Used L3 L1 L1L1-9
FUGE FZR	2FG	DESK	Compliance Y N	e Items: Y - Compliance N - Non-Compliance Blank - Not Evaluated
9 10 4 3 14 14000		2 Fug	Sig Sig So Re So So So So So So So So So So	compliance Items: Ins & Labels: Room Frigerator / Freezer S. Vials Freezer S. Vials Freezer Fre
Wipe Sample	Results:		e	tc. ventory & Disposal Records
Nuclide 1 Nuclide 2 Nuclide 3 Nuclide 4 Note: All wipe sample results are in units of Comments:	5 6 7 DPM / 100 sq. cm.	8 9	10 Su Pro	rvey Records Current rsonnel Trained ohibition on Mouth Pipetting idiation Levels ontamination (Wipes) 100 DPM/100 sq. cm.
				Other (Specify in Comments) ESI Form HPS 1 Rev 1.0 1/92

RADIATION	SAFETY SUF	RVEY		BLDG	RE	ROOM NO.
AUTHORIZED INVESTIGATOR	NAME (last, first init	tial)	PHON		DATE (month, day, year) -29 -92
SURYEYOR	NAME (last, first init	tial)	PHON	E NO.		METER USED
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AUTHORIZED INVESTIGATOR		1E (last, fir	et initial)			PHO	NEN	10.	DATE (month	, day, year	
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RADIATION	SAFET	TY SUR	VEY				BLDG	SRF	ROC	M NO.	T ₀
AUTHORIZED INVESTIGATOR	NAME (last, first initis	al)			PHC	NE NO.			, day, year 1-92	
SURVEYOR		last, first initia	al)			PHC	NE NO.	SURVE 13		ER USED	
				AND CONTROL OF STREET	, /	/	COMPLIANC	EITEMS		OMPLIAN VIOLATION	
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/							411	ELI			(19) Pe	arvey reco	rain e d		
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RADIATION	SAFET	Y SUR	VEY				BLDG	SPL	RC	UKIN C	
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RADIATION SAFETY SURVEY AUTHORIZED INVESTIGATOR NAME (last, first initial) NAME (la	ECO	LC	G'	Y	SE	RVI	CE	S,	IN	IC	- 4			-0	A	
AUTHORIZED NAME (last, first initial) Name (last, first i	RADIAT	пои	S	AFE	ΓY	SURVE	Υ					BLDG	m	RO		
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Rev. Oct 1990

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RADIA	TION	SA	AFET	Y	SUI	RVE	Υ					BLDG	B	RF	RO	OM NO	OVV.
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ide of the t	1	2	3	4	->	b						(25)	Sur	ibration c vey meter vey meter ner (SPE	ers a	perationa √ailable	

RADIATION	SAFE	TY SU	JRVEY					BLDG_	SPE		DOM NO.	1
AUTHORIZED INVESTIGATOR	NAME	(last, first in	nitial)			PHO	NE	NO.	DATE (mon	th day, ye	ar)
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RADIATION	SAFE	ry sur	RVEY				BLDG	BRF		OM NO, EST CO	rr.
AUTHORIZED INVESTIGATOR	NAME (last, first init	ial)			PHONE	E NO.	DATE		h, day, year	
SURVEYOR	NAME (last, first init	ial)			PHONI	E NO.	100	EY MET	TER USED)
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NUCLIDE 3										1111	

RADIAT	ION	SA	AFET	ſΥ	SUF	RVE	Υ					BLDG	RF	RO Sa	OM NO CO	SVY.
AUTHORIZE INVESTIGAT		N	AME (last, fi	rat initi	al)				PH	ONE	NO.	DATE (mont!	h, day, year	
SURVEYOR	R	N.		last, fi	rst initi	al)				PH	HONE	NO.	SURVE 130	1000	TER USEC)
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side of the ta					4	ine	Tuchu	e(3) u	IOWII LI	10	4	(22) R			2.5 mR/hr	
OCATION	- 1	2	3	4	5	6	7	8	9	10		<	100 dpm	10.75		
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NUCLIDE 2	100					******					MET	MANAGEMENT OF STREET	METER	MANAGONIVISEN	IN REMAR	RKS

RADIATION SAFETY SURVEY AUTHORIZED INVESTIGATOR SURVEYOR NAME (last, first initial) PHONE NO. SURVEY METER USED COMPLIANCE ITEMS Y S COMPLIANCE ITEMS Y S COMPLIANCE OR Name (1) Signs & lables: room (2) Source containers (3) Refrigerator i freezer (4) LSC valis (5) Weste containers (6) Other equipment (7) Absorbant paper (on radionucilid use areas) (8) Adequate personnel external mentioning mentioning (11) Radioactive waste management (12) Adequate radionucilide storage (13) Routine use of gloves (14) Routine use of gloves (14) Routine use of gloves (15) Shielding, frequired (16) Prohibition of eating, drinking, and smoking (17) Inventory i disposal records (18) Survey records current (19) Personnel trained (20) Prohibition on unth pipetting and smoking (17) Inventory i disposal records (18) Survey records current (19) Personnel trained (20) Prohibition on unth pipetting (21) Cordioar storage meets require ments (22) Radiation levels < 2.5 mR/hr (23) Contamination (smears) (24) Calibration current (25) Survey meters available (26) Survey meters available (26) Survey meters available (27) Other (SPECIFY IN REMARKS)		/ (1)	Y S		7 1		· ,					also and the second section (****		-01	-)	
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	NUCLIDE A KIW			\Rightarrow						H				eters			RKS

ECOLO	G'	Y	T	RV	IC	E	S,	IV	C.	4	COMPA	MA	NAME	FI	A	
RADIATION	SA	AFET	Υ	SUR	(VE)	Y					BLDG_	3R	*****	ROC	DIM NO.	xck
AUTHORIZED INVESTIGATOR	N	AME (ast, fi	rst initi	al)				PHO	VE I	40.	[DATE (month	, day, yea	
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NUCLIDE 3																

INVESTIGATOR NAM	E (last, first initial) E (last, first initial)	No	orth orr.	1	PHO	Y N	(1) Sign	SURVEY 13 WE ITEMS	month, of - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 - 191 -	R USED
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	43	Co	YY.	1		4	(2) Sour	rce contai	ners	
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RADIATION	SAFETY	SURVEY		BLDG	DE	ROOM NO.
AUTHORIZED INVESTIGATOR	NAME (last,	first initial)	PHO	ONE NO.		month, day, year)
SURVEYOR	NAME (last,		PHO	ONE NO.	-	METER USED
			/	COMPLIANC	EITEMS	Y=COM LIANCE N=VIOLATION
				Y M		
SMEAR RESULTS side of the table. All OCATION 1 IUCLIDE 1 IUCLIDE 1 IUCLIDE 1	(in DPM)	CAB, (fill in the nuclide(s) 2) 5 6 7 8	DESK LSC down the	(2) Soul (3) Ref. (4) LSC (5) Was (6) Oth (7) Abs (8) Add (9) Hoo (10) Ac (11) Rs (12) Ac (13) Rs (14) Rs (15) Si (16) Pr (20) Pr (21) Con (25) S (26) S	ste container er equipmed orbant per equipmed orbant per equate hordant er equate hordand equate per equate reputine use outine use on entained er entained in entained e	iners freezer ners nent iper (on radionuclide od flow oin calibration ersonnel external waste management adionuclide storage of gloves of lab coats frequired of eating, drinking, ng disposal records ords current rained on mouth pipetting rage meets require- evels < 2.5 mR/hr on (smears)
NUCLIDE 2						

No RAM Use

ECOLO	UTHORIZED NAME (last, first initial) VESTIGATOR NAME (last, first initial)								IC.	W.	MPA	MAN YM	F	DA	
RADIATION	SA	AFET	Υ	SUP	VE	Υ					BLDG	3RF		OM NO.	rr,
AUTHORIZED INVESTIGATOR	N/	ME (last, fi	rst initi	al)			and different and a second	PHO	ONE	10.		(month	n, day, year	
SURYEYOR	1 1			rat initi	al)	10 November 201			PHO	ONE	VO.	SURVE L3		TER USEC)
	North	2	Ne poblections	MANAGE STATES	ANNOTATION A	A. princip Scanner				СОМ	PLIANC	EITEMS		COMPLIAN VIOLATION	
SMEAR RESULTSITE of the table. OCATION 1 NUCLIDE 12 NUCLIDE 2	FZR FZR TS (in All sme	DPN			the r	nucli d	e(3) d	own ti		Y K	(2) So (3) Rel (4) LS (5) Wa (6) Oth (7) Ab (7) Ab (8) Ad (9) Ho (10) A (11) R (12) A (13) R (14) R (15) S (16) P (20) F (21) C (25) S (26) S (27) C	ste container equiposorbant puse areas) equate hod air flow dequate monitoring adioactive dequate foutine us hielding, rohibition and smoke ventory for contamina a diation is contamin	iners freeze iners ment aper (ood flo win ca person g e waste radionu ge of le if requ of eat cing dispos cords c trained orage levels currer eters o eters av	on radionu w libration nel extern managen uclide ston loves b coats ured ing, drinki al records urent d outh pipet meets req (2.5 mR/hr mears) ut perational vailable IN REMAI	al nent age
										MET	ER 1	METE	R 2	METER	3
NUCLIDE 3									-						

ECOL	0	G	Y	SE	CR	VI	CE	IS,	II	1	J.	COM	IPAN	NAME	FDA	
RADIATIO	N	S	AFE	TY	SU	RVI	ΕY				***************************************	BLD	G K	RE	ROOM !	10 Coch
AUTHORIZED INVESTIGATOR	}	N	AME	(last,	first in	itial)					PHON	E NO.			month, day	
SURVEYOR		N	AME	(last,		itial)					PHON	E NO.		SURVE 130	Y METER	USED
	MENNINE COLO	100000		#4 munhatraka				i da mallar da	d paleoner is con	Carles and a	co	MPLIA	NCE	ITEMS	Y=COM N=VIOL	PLIANCE ATION
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side of the table.	Al:	am ei	ars 10	0 cm ²)	T	T	1		T -	4		Rac	diation lev	vels < 2.5 m on (smears	
LOCATION 1		2	3	4	5	6	7	8	9	10			Cali	100 dpm bration c	ument ers operation	nal
NUCLIDE & clo	0				>							(26)	Sur	vey mete	rs available	e
NUCLIDE 2											ME	TER	TO STATE OF THE PARTY OF	METER	WHEN PERSONNELS AND PROPERTY OF	The same of the same of
NUCLIDE 3						PROTESTAL LINES										

ECCI	LO	GY	5	SEI	RV	IC	ES	5,	IN	C.	3	SMPA	ANA	NAME	FDA		
RADIATI	ON	SA	FET	Y :	SUR	VEY	1				B	LDG	VM)	ROC	M NO.	
AUTHORIZE INVESTIGAT		NA	R		it initia					PHON	EN	0.	2	ATE (month - (5	day, year	1
SURVEYOR		NA	Acres de la companya del la companya de la companya	All Control of the Control	et initis					PHON	EN	0.	5	URYE	Y MET	ER USED	X DESC. 10
1000 (Serveta 14 Serveta 1886 - 1874) Se	180° 1986, 496, 644, 305	EATA THE	200000000000000000000000000000000000000	OF THE LOCAL PROPERTY.	· 安全和 和公司。	120011000000000000000000000000000000000	Secretary Children	A SERVICIONE VILLEDA	aucatra/comea	C	OMP	LIANG	EI	TEMS		OMPLIAN	
HOOD			2						400		**************************************	(2) Sc (3) Re (4) LS (5) W O A (8) A A (9) H (10) / (12) (13) (14) (15) (16) (17) (18) (18) (20) (21)	bure: selfing 96C vester baser base	containe quipment part part part part part part part par	ners freezer ners nent aper (on radionu ibration nel extern managen clide stor oves b coats ired ng, drink at records ument	nent age ing,
SMEAR RE				- 10%	(fill in	ther	nucild	e(3) d	own tr	ne P	+	(22)	Rad	iation I	evels (2.5 mA/h mears)	r
LOCATION	1	2	3	4	5	6	7	8	Q)	10		(24)	< 1 Cali	00 dpn bralion	n currer		
NUCLIDE 1	210				>						-	1(25)	Sur	vev me	eters a	railable IN REMA	
KOULIDE 2	400				->						MET	AND DESCRIPTION OF THE PERSON NAMED IN COLUMN	1	METE	NAME AND POST OFFICE ADDRESS OF THE PARTY OF	METER	- 1
NUCLIDE 3									1								

ECO												0100			- W	MANA	
RADIAT	NOI	SA	AFE	TY	SUF	VE	Υ					BLDG	M	M	HOC	105	
AUTHORIZ INVESTIGA		N			irst initi 5, M					PH	ONE	NO.		DATE (, day, ye	ar)
SURVEYO	R	N _i	AME (last, f	irst initi	al)				PH	ONE	NO.		SURVEY	MET	ER USE	D
	NAME OF THE OWNER, OF THE OWNER, OF THE OWNER, OF THE OWNER, OWNER, OWNER, OWNER, OWNER, OWNER, OWNER, OWNER,	CONTRACTOR OF STREET	C WAS ONLY	MAC ME MAT, MINISTER, 20	PROPERTY NAMED AND ADDRESS OF THE PARTY NAMED AND ADDRESS OF T	LES SERVICIONES CO	ESSEN, MENERAL NORM	Carrothin Salan	ANCH THE SOURCE OF	SET SEED MERIDING	CON	APLIAN	ICE	ITEMS		COMPLIA	
		1	iel	L.							YN						
RER												(2) S (3) R (4) L (5) Y (6) C (7) A (8) A (9) H (10)	our SC Vast the bed dec dec Ad Ad Rac	s & lables ce contain gerator / fi vials e contain requipm orbant passareas) quate horbant flow equate ponitoring dioactive equate ra	ners reezer ent per (continues in cal ersonr	on radion W ibration nel exter manage	nal ment
SMEAR R	ESULT	S (in	DPN	1)	(till in	the	nuclid		Jown th	1e		(13) (14) (15) (16) (17) (18) (19) (20) (21)	Ro Ro Shi Pro ar Inv Sui Per Co m	utine use utine use elding, if chibition o nd smokir entory/d rvey reco rsonnel to chibition midor store ents	of glace of later of eating is possible or more range reads or mage read	oves b coets ired ng, drini al records urrent outh pipe neets re	king, s kiting quire-
side of the t	able, A	sme 2	ars 10	00 cm ²	5	6	7	8	9	10		(23)	Co	diation le ntaminati 100 dpm	on (st	mears)	
NUCLIDE 1	دانات	-		7						10		(25)	Su	ibration of rvey met rvey met her (SPE	ers op ers av	erational railable	
NUCLIDE 2	00										ME	TER	1	METER	PARALISE TRANSPORT	METER	PART STATE AND INCOME.
NUCLIDE 3																	

RADIAT	ION	S	AFE	TY	SU	RVE	Y					BLDG_	RE	RC	OM NO.	
AUTHORIZ INVESTIGAT		N	AME	(last, l	first in	itial)	NOT THE OWNER, WHEN			P	HONE	NO.			h, day, ye	ar)
SURVEYO	R	N	AME	1	first in	itial)				PI	HONE	NO.	SURVE 13		TER USE	D
Aut		Service Supra	elenker versolisin	Action between		games a construction of the			5	NU	-		EITEMS		COMPLIA	
9			6						7		Y	(1) Sig (2) Soi (3) Ref (4) LSo (5) Wa	ste contair	ners reeze		
	ĮŪ.				5	G						(7) Abs (8) Ad (9) Ho (10) A	ner equipm sorbant pa se areas) equate ho od air flow dequate p monitoring	per (od flo in ca ers on	w Jibration nel extern	nal
2								4	1	/ /	4	(12) A (13) R (14) R (15) S (16) Pr	adioactive dequate racutine use outine use hielding, if rohibition cand smokir	of g of la requ	uclide ator loves ib coats lired	rage
7	All Michigan	resultant supplies		3		MANAGE STATE OF THE STATE OF TH		5H		68 KIRKMOURS	4444	(18) S (19) P (20) Pr (21) C	ventory / di urvey reco ersonnel tr cohibition c orridor stor	rds c aine c on mo	urrent I outh pipet	tting
MEAR RE				,		the	nuclid	le(s) d	own t	he	4	(22) R	nents adiation lev ontaminatio			,
OCATION	1	2	3	4	5	6	7	8	9	10		(24) C	100 dpm alibration c	urren		
	400									>		(26) S	urvey mete urvey mete ther (SPE	TS BY	ailable	RKS
UCLIDE 2		1						-			145	TER 1	METER	POTREMINISTE PARCE	METER	A STREET, ST.

AUTHORIZED INVESTIGATOR NAME (last, first initial) SURVEYOR NAME (last, first initial) LATTS C FUGE SHELF SHELF Y Y Y Y SHELF	x t V W	MPLIANCE (1) Sign (2) Soul	DATE (1) SURVEY L3 EITEMS	month 19 - 6 / MET J C(Y=0 N=1	ER USED
FUGE SHELF SHELF	CON	MPLIANCE (1) Sign (2) Sou	ITEMS	Y=0 N=1	U-9 COMPLIANCE
1EST 1 2 3 4 5	x t V W	(1) Sign (2) Sou	ns & lables	N=	
3	Ast Y B	(1) Sign (2) Sou			
SMEAR RESULTS (in DPM) (fill in the nuclide(s) down to side of the table. All smears 100 cm²) LOCATION 1 2 3 4 5 6 7 8 9 NUCLIDE 10 10 10 10 10 10 10 10 10 10 10 10 10	he 10	(4) LSC (5) Was (6) Other (7) Abs (8) Ade (9) Hoo (10) Ad (11) Ra (12) Ad (13) Ro (14) Ro (15) Sh (16) Pr (17) Inv (18) Su (19) Pe (20) Pr (21) Co m (22) Ra (23) Co (24) Ca (25) Su (26) Su	igerator / file vials te contain er equipm orbant pa e areas) quate hor d air flow dequate proportion dioactive dequate ra putine use putine us	ners reeze ners ners ners ners ners od flo in cal erson waste dionu of gl of la requip f eati ng ispose rds curren con (sr curren ers op ers av	on radionuclical wall bration nel external management oves broats ired ng, drinking al records urrent outh pipetting neets required 2.5 mR/hr mears)
NUCLIDE 3	ME	TER 1	METER	2	METER :

ECOLO				1.0							-		-	-	DH	
RADIATION	SA	AFET	ΓY	SUF	RVE	Y					BLDG	R	F	150	om no c	orv
AUTHORIZED INVESTIGATOR	N.	AME (last, fi	rst init	ial)				PH	ONE	NO.	1		mont	h, day, yer	ar)
SURVEYOR		AME (last, fi	rat init	tial)				PH	ONE	NO.	5	URVE 13		TER USE	D
	MADE OF THE PROPERTY.	Access and any area		SECTION AND PROPERTY.						COM	IPLIANC	Εľ	TEMS		COMPLIA VIOLATIO	
SMEAR RESULT side of the table. A	FZZ I	DPN		(fill in	3 FZR		2 e(s) d	EAS		Y	(11) Ri (12) A (13) Ri (14) Ri (15) Si (16) Pi (17) In (18) Si (19) Pi (20) Pi (21) C	out out hield out	e contained areas) sate ho air flow quate pritoring oactive quate rine us ine	iners freeze freeze ners nent aper (cod flo vin ca persor g waste adion e of g e of la if requi of eal ing dispos ords c traine on m orage evels ion (s	on radion w dibration mel exten e manage uclide sto loves ab coats uired ing, drink al records urrent d outh pipe meets rec x 2.5 mR/h mears)	ment rage king, dtting quire-
NUCLIDE L	-				-				-		(25) S	urv	ey me	ters o	perational	
PKIO	Minor.			\rightarrow											vailable IN REMA	VRKS
NUCLIDE 2		1	ā .		1	1		1	1	BUNNERSCHEIN	S. STATUTE COLUMN 2 AN INCOMPANSABLE	MATERIAL PROPERTY.	DESCRIPTION OF THE PARTY OF THE	N. B. CALLES S. G.	WHIPPELEIGH REPORTSHANKERANDER	NUMBER OF STREET

ECOLOGY SERVICE 300 Second St., Laurel, (301) 498-1514		אניז 🌑			Comp	any Na	une:	4	FDA	
A	RADIA	TION .	SAFE	TY SU	RVE.	Y			Building / Room: BRF	/LAB 18
Authorized Inve	estigator.	. NA	ME:						Phone No.	Date: 10-19-92
Surveyo		NA.	ME: JATT	, C			Total and a second		Phone No.	Survey Meter Used 13 wl 44 - 1
FUGE		F2	R P	FG		0	ESK		perm, perm,	Y - Compliance N - Non-Compliance Blank - Not Evaluated
		Hoo	D				7 -	DES	Signs & Late of Source Con Control Con	tainers // Freezer ainers ment Paper ood Flow ersonnel Monitoring Waste Management dionuclide Storage of Gloves of Lab Coats
	ļ	Vipe Sa	mple R	esults:					etc.	
Nuclide 3 Nuclide 3 Nuclide 3 Nuclide 3 Note: All wipe sam		are in ur		PM / 100	sq. cm.	8	9	10	Radiation L	rained on Mouth Pipetting evels on (Wipes) M/100 sq. cm. falibration Current eperational
										1 Form HPS 1 Rev 1.0 1/92

RADIATION	SAF	ETY	SURVI	EY					BLDGF	-B8	800M NO. 3756
AUTHORIZED INVESTIGATOR			rst initial)				PHO	NE N		DATE (month, day, year) -20-92
SURVEYOR		E (last, fi	rst initial)	if german contraction	oction micros	WANTED TO STATE OF THE STATE OF	PHO	DNE	10.		Y METER USED
		CATET	-			15		COMF	LIANC	E ITEMS	Y=COMPLIANCE N=VIOLATION
		4		7				YN			
4				3/2		FZ	R		(2) Sou (3) Ref (4) LS((5) Was (6) Oth	ste contair ier equipm	in ers re ez er n ers
4				q					(8) Add (9) Hoo (10) Add (11) Re	dequate p monitoring adioactive	in calibration ersonnel external
STAX 2 CART		01		. [8		16	Er Er	4	(13) R (14) R (15) S (16) P (17) In (18) S (19) P	outine use outine use hielding, i rohibition and smoki ventory! o urvey reco ersonnel t	e of gloves e of lab coats f required of eating, drinking ng fisposal records ords current
MEAR RESULT			(fill in the	nuclid	e(3) d	own ti	ne		(21) C r (22) R	omidor sto nents adiation le	rage meets require vels < 2.5 mR/hr on (smears)
OCATION 1	2 3	3 4	5 6	7	8	9	10		(24) C	100 dpm alibration	current
UCLIDE A KIES							>	4	(26) 5	urvey met	ers operational ers available ECIFY IN REMARKS
IUCLIDE 2						1100-00 1000000		MET	ROAL-PROPERTY HOLDS	METER	A MATERIAL PROPERTY OF THE PARTY OF THE PART

METER SIN 8000 AT 89 CAL

RADIATION	SAFE	TY SU	RVEY	***************************************				BLDG +	RX	FDI	NO.
AUTHORIZED INVESTIGATOR	NAME	(last, first in	itial)			PHO	ONE		DATE (month, de	
SURYEYOR	NAME	(last, first in	itial)		(1 m), 4 m or or or	PHO	ONE	NO.	SURVE	METER	USED
	/				aluninnyesi krisi	NAMES OF THE PROPERTY OF THE	СОМ	PLIANCI	EITEMS		APLIAN LATION
SHELVES SMEAR RESULTS side of the table. All OCATION 1	WA I I S (in DPM	RF 8 6	Non STOT AM/R Hora the nucli	RAC	3 =	T JAZE		(2) Sou (3) Refr (4) LSC (5) Was (6) Oth (7) Abs us (8) Ade (9) Hoo (10) Ad (11) Ra (12) Ad (13) Ro (14) Ro (15) Sh (16) Pro (17) Inv (18) Su (19) Pe (20) Pro (21) Co m (22) Ra (23) Co (24) Cal (25) Sui (26) Sui (26) Sui (26) Sui (26) Sui (26) Sui (26) Sui	ns & lables ree containing erator of the container equipmed or bank payed areas and air flow equate personnel transplation of the containing of the containi	reezer ers ent eer (on re er (on re	nageme e storaç s sats drinkin cords st pipettir s requir
UCLIDE 2				-				(27) Oth	ner (SPEC	IFY IN R	EMARK

RADIATION	SA	FET	Y	SUF	RVE	Υ					BLDG	B8		OM NO.	
AUTHORIZED INVESTIGATOR	N/	ME (ast, fir	st init	ial)				PHO	ONE	NO.		(month	h, day, year)
SURYEYOR	N/	ME (rat init	ial)				PH	ONE	NO.		EY ME	TER USED)
	MARKET COMM	H			10					СОМ	PLIANC	E ITEMS		COMPLIAN VIOLATION	
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SMEAR RESUL			1		ther	nuclid	e(s) d	FZ'	AND VALUE		(18) S (19) P (20) P (21) C	urvey red ersonnel rohibition omidor st ments	trained on morage	urrent	uire-
side of the table. A	-	-		5	6	7	8	9	10		(23) C	contamina < 100 dpr	dion (s		
LOCATION 1	2	3	4	5	р	/	0	ä			(25) 5		eters o	perational	
311 40									Þ.			Survey me Other (SF		vallable IN REMAP	RKS
NUCLIDE 2										ME	TER 1	METE	R 2	METER	3

RADIAT	ION	SA	FE	ΓY	SUI	RVE	Υ					BLI	DG-	BS		OM NO.	
AUTHORIZ INVESTIGAT		N/	ME (last, fi	nst ini	tial)				F	HON	E NO	4		month	n, day, year)
SURVEYO		N/	ME (last, fi	rst ini	tiel)				F	HON	E NO			ME	TER USED)
	MONORAL MARC	L5C	ACCESSION OF THE			AND ADDRESS OF	ALCOHOLOGICA CONTRACTOR	Pag 1	1-13 or		-		ANCE	ITEMS		COMPLIAN VIOLATION	
	[C		1								Y		Sign	3 & lable:	s:roc	om	
LSC	Exagr.	1,2								BAT		(3)	Refri	ce contai gerator/fi viala e contain	reeze	r	
7				21			61					(6)	Othe Abso us	er equipm orbant pa e areas)	ent per (on radi on u	eli d
			K		1							(9)	Hoo: 0) Ad	quate hod d air flow equate po nonitoring	in cal erson		a.
	H)	D LIP	1						3				2) Ad 3) Ro	equate ra utine use	dionu of gl		
3474	1	CORP	1									1 (1	5) Shi 6) Pro	utine use elding, if hibition o nd smokir	requ of eat		ng
400D	6			1 51	NK				-	FZR		[1	7) Inv 8) Su	entory/di rvey reco	sposi rds c		
	2/				9		No. 5 beautiment		1 -	RFK		7 12	0) Pro	rsonnel tr hibition a midor stor	on mo	l outh pipett neets requ	in g
SMEAR RE						the	nuclid	le(3) d	lown	the		(2	2) Ra	ents	vels «	2.5 mR/hr	
OCATION	1	2	3	4	5	6	7	8	9	1	0	/ (2	4) Cal	100 dpm ibration c	urren		
	4100											[2	6) Su	rvey met	ers av	perational railable IN REMAR	RKS
NUCLIDE 2											М	ETER	AND SHIP IS A SHIP IS A	METER	AND DESCRIPTION OF THE PERSON NAMED IN COLUMN	METER	3
OCTIVE 3																	

PRADER CONTAMINATED; 7500 dpm / 20cm²
HOLD LIP CONTAMINATED; 3654 dpm / 20cm²
METER EN 86569 CUT OF OIL

Rev. Oct 1990

RADIAT	ION	S	AFE	TY	SU	IRVE	Υ						BLDG	F	R8		846	
AUTHORIZ IN VESTIGAT		N	AME	(last,	first in	nitial)				F	PHOP	VE N	10.		DATE (mont	h, day, yer	ar)
SURVEYO	R		. 6	(last, 1	first in	nitial)				F	PHOP	4E M	10,		SURVEY	ME	TER USE	D
11/1			()	A Vesto Montrio				INC	ia.	Ho	C	ОМЕ	LIA	IC E	ITEMS		COMPLIA	
		*****						L		00	Y	H						
XEX S											L		(2) 5	oun	& lables ce contai gerator/fi	ners		
													(4) L	SC			ar	
	3												(6) C)the	r equipm	ent	on radion (eli d
									С				(8) 🗚		areas) uate hoc	d flo) W	
1											L			Ade			libration nel exterr	lal
4														Rad			managen	
					-				-		E		(13)	Rou	tine use	of g		aye
				SINY	((15)	Shir	elding, if	requ		na
/	1			Q		60			3	H				an	d smokin	g	al records	
						1	T			0	E		(19)	Per	vey recor sonnel to	ained		
	CLUZ			CHARLES THE SECTION OF THE SECTION O	NAME OF THE OWNER.	MACHINE STATISTICS	F	CONSIDERATION OF THE PERSON OF	NAME OF STREET	0	L			Con	idor ston		outh pipet meets req	
SMEAR RE side of the tal						n the r	ruclid	e(3) d	own t	he		Accessed.			iation lev		2.5 rnR/hr	
LOCATION	1	2	3	4	5	6	7	8	9	10				< 1	taminatio 00 dpm bration cu			
NUCLIDE 13	(100									>	F		(25)	Sun		ta ot	erational	
NUCLIDE 2	100										-		(27)	Oth	er (SPEC	CIFY	IN REMAR	STREET, STREET,
NUCLIDE 3											M	ETE	R 1		METER	2	METER	3

RADIATIO	N S	AFE	TY	SU	RV	EY					8	BLDC	F	B8	R	OM NO	
AUTHORIZED INVESTIGATOR		IAME	(feat)	first in	itial)		na sia ineria ta in	O A Philippe on Security	F	НОІ	NEN			DATE (mon	and the second second second	Contract Contract
SURVEYOR	1	LIAT			itial)				F	HO	NE N	10.		SURVEY 13		ETER U	SED
		S. Zeysoritz en Liego mil	окажителиция		See First State (Kasta)	PERSONAL PERSONAL PROPERTY.		Selection and the		С	ОМР	LIA	NCE	ITEMS	Y	COMPI	JANC
FURE			5 1				1	-21	<	Y	H						
SINK SINK SINK SINK SINK SINK SINK SINK					1	nuclid	e(3) d		CANCELL PROPERTY.			3) F4 L L S5) Y A B A A S9) F 10) 112) 13) 14) 15) 16) 17) 18) 19) 20) 21) 22)	Refrisco Vest to the Control of the	gerator / fri vials e contain r equipm rbant par eareas) quate hor dair flow equate pe onitoring floactive ve quate ra utine use elding, if hibition o d smokin entory / dis vey recor sonnel to hibition o ridor store ents liation lev otaminatio 00 dpm	reeze ent per (od fl in common of se example of exampl	on radio ow alibration nel ext e manag uclide s gloves ab coats uired ting, dri val recor ument d outh pip meets r	nemal geme torag nking ds
OCATION UCLIDE 1		3		D	6	'	0	9	10		Charleman .		Cali	bration cu vey mete			al
1 P 9	0 -			\rightarrow						F		26)	Sur	vey mete er (SPEC	r3 &	railable	
UCLIDE 2										-	ETER	PETALISTYTANS	aneoseup	METER	NUMBER AND SERVICE	МЕТЕ	CAIRMEANNING

ECOLOGY SERVICES, INC. 300 Second St., Laurel, Maryland 207 (301) 498-1514	07	Com	pany Nam	ic:		FDA	
RADIATI	ON SAFETY	SUR VE	EY.			Building / Room:	16402
Authorized Investigator:	NAME:					Phone No.	Date:
Surveyor:	NAME:					Phone No.	Survey Meter Us
SINC	ICE					anno anno	Y - Compliance N - Non-Complianc Blank - Not Evaluate
CENT. RFG FZR				BEZCH		Signs & La Source Cor Refrigerato L.S. Vials Salan Waste Con Absorbent Adequate I Adequate I Radioactive Adequate I Routine us Adequate I Routine us Adequate I Prohibition	tainers r / Freezer tainers pment Paper food Flow Personnel Monitorin e Waste Management radionuclide Storage e of Gloves
La de la companya de	Vipe Sample Re	esults:				etc.	& Disposal Records
Nuclide 1 Nuclide 3 Nuclide 4 Note: All wipe sample results Comments:			7 8	9	10	Radiation Contamina < 100 Di Survey Instrumen	Trained n on Mouth Pipettin Levels ation (Wipes) PM/100 sq. cm.
No RAI	n Use					00	Other (Specify in Comments)

Company Name: 4NJ Sevend St., Lauret, Maryland 20707 (301) 49N-1314	FDA	
RADIATION SAFETY SURVEY	Building / Room: MOD \	13404
Authorized Investigator: NAME:	Phone No.	Date: 10-19-92
Surveyor: NAME:	Phone No.	Survey Meter Us
GA REG H		Y - Compliance I - Non-Compliance lank - Not Evaluat
B E B E N C H WI HOUSING	Complian Signs & Lab Source Cont Refrigerator L.S. Vials Other Equip Absorbent F Adequate H Adequate P Radioactive Routine use Adequate use	rainers / Freezer ainers ment raper ood Flow ersonnel Monitorir Waste Manageme adionuclide Storage of Gloves of Lab Coats
Wipe Sample Results:	etc.	of eating, drinkin
LOCATION: 1 2 3 4 5 6 7 8 9 10	Survey Instrument	fords Current Trained on Mouth Pipettir Levels Lion (Wipes) M/100 sq. cm. Calibration Curren Operational
	00	Available Other (Specify in Comments) S1Form HPS.1 Rev 1.0

Company Name: ECOLOGY SERVICES, INC. JAN Second St., Laurel, Maryland 20707 (291) 498-1514 Building / Room: RADIATION SAFETY SURVEY 2305 NOOD Phone No. Date: NAME: Authorized Investigator: Survey Meter Used Phone No. NAME: 12,000 Surveyor. Compliance Items: Y - Compliance N - Non-Compliance DECK FLAMINI 00 Blank - Not Evaluated Compliance Items: Signs & Labels: Room ☐ ☐ Source Containers Refrigerator / Freezer U L.S. Vials ☐ ☐ Waste Containers Other Equipment Absorbent Paper Adequate Hood Flow Adequate Personnel Monitoring Radioactive Waste Management Adequate radionuclide Storage ☐ ☐ Routine use of Gloves Routine use of Lab Coats RFG DESK Adequate use of Shielding Prohibition of eating, drinking, Wipe Sample Results: Inventory & Disposal Records 8 10 LOCATION: Survey Records Current Personnel Trained Nuclide 1 Prohibition on Mouth Pipetting Nuclide 2 ☐ ☐ Radiation Levels Nuclide 3 Contamination (Wipes) Nuclide 4 < 100 DPM/100 sq. cm. Survey Instrument: Note: All wipe sample results are in units of DPM / 100 sq. cm. Calibration Current Operational Comments: Available Other (Specify in Comments) ES1 Form HPS. 1 Rev 1.0 1/92

ECOLOGY SERVICES, INC. XXI Second St., Laurel, Maryland 207 (301) 498-1514	w?	Company Na	me:	FDA	\
RADIAT	ON SAFETY S	SURVEY		Building / Room:	1 2418
Authorized Investigator:	NAME:			Phone No.	Date: 10-19-97
Surveyor:	NAME:			Phone No.	Survey Meter Us
RFG L		DESK		and the	Y - Compliance N - Non-Compliance Blank - Not Evaluat
BEZZ	BENCH	FLE	FILE	Signs & La Source Cor Refrigerate Cor Routine Equate Cor Radioactiv Cor Radioactiv Cor Routine us	ntainers or / Freezer stainers ipment Paper Hood Flow Personnel Monitorin e Waste Manageme radionuclide Storage se of Gloves
A	Vipe Sample Resul	lts:		etc.	& Disposal Records
Nuclide 3 Nuclide 4 Note: All wipe sample results	are in units of DPM /	6 7 8	9 10	Radiation Contamina < 100 Di Survey Instrumen	Trained n on Mouth Pipettin Levels ution (Wipes) PM/100 sq. cm. tt: Calibration Current
Comments:	RAM USE			00	Operational Available Other (Specify in Comments) EST Form HPS. I Rev 1.0 1/2

ECOLOGY SERVICES, INC. Company Name: HR) Second St., Laurel, Maryland 20707 (301) 498-1514 Building / Room: RADIATION SAFETY SURVEY NOD 2313 Phone No. Date: NAME: Authorized Investigator: 10-19-97 Phone No. Survey Meter Used NAME: 144-9 Surveyor: Compliance Items: Y - Compliance N - Non-Compliance LSC. 00 Blank - Not Evaluated 0 0 Compliance Items: Signs & Labels: Room ☐ ☐ Source Containers — Refrigerator / Freezer F27 150 L.S. Vials Waste Containers N Other Equipment LSC Absorbent Paper 2 Adequate Hood Flow Adequate Personnel Monitoring FILTER Radioactive Waste Management HOUSING Adequate radionuclide Storage ☐ ☐ Routine use of Gloves Routine use of Lab Coats Adequate use of Shielding Prohibition of eating, drinking, Wipe Sample Results: ☐ ☐ Inventory & Disposal Records LOCATION: 8 9 6 7 10 2 ☐ ☐ Survey Records Current Personnel Trained Nuclide 1 Prohibition on Mouth Pipetting Nuclide 2 Radiation Levels Nuclide 3 ☐ ☐ Contamination (Wipes) Nuclide 4 < 100 DPM/100 sq. cm. Survey Instrument: Note: All wipe sample results are in units of DPM / 100 sq. cm. Calibration Current Operational Comments: Available Other (Specify in Comments) ESI Form HPS.1 Rev 1.0 1/92

(2011) 398-1514			FDA
RADIATIO	ON SAFETY SURV	EY	Building / Room: 2315
Authorized Investigator:	NAME:		Phone No. Date: 10-192
Surveyor:	NAME:		Phone No. Survey Meter Us
H000	TABLE	B	Compliance Items: Y - Compliance Y N N - Non-Compliance Blank - Not Evaluat
H 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		A SINK	Compliance Items: Signs & Labels: Room Refrigerator / Freezer L.S. Vials Waste Containers Other Equipment Absorbent Paper Adequate Hood Flow Adequate Personnel Monitorin Radioactive Waste Manageme Adequate radionuclide Storage Routine use of Gloves Routine use of Shielding Prohibition of eating, drinking
LOCATION: 1 2 Nuclide 1	ipe Sample Results: 3 4 5 6 re in units of DPM / 100 sq.		etc. Inventory & Disposal Records Survey Records Current Personnel Trained Prohibition on Mouth Pipettin Radiation Levels Contamination (Wipes) < 100 DPM/100 sq. cm. Survey Instrument: Calibration Current Operational Available

	5 14 1	NAME:	C					Phon	e No.	Date. 10-19-92				
		1	C			-	uthorized Investigator:							
The state of the s	DESK		Surveyor: NAME: ATTS C											
4					6	12	46		N N	Y - Compliance - Non-Complian lank - Not Evalue				
	DESK	BEI	CESK	H	3	2	BWZYH		Signs & Labe Source Conta Refrigerator L.S. Vials Waste Conta Other Equipa Absorbent P Adequate He Adequate Pe Radioactive Adequate rad Routine use Routine use Adequate use	ainers / Freezer iners ment aper ood Flow resonnel Monitori Waste Manageme dionuclide Storag of Gloves of Lab Coats te of Shielding				
	Wij	oe Sampi	le Resi	ults:					etc.	of eating, drinkin				
Nuclide 3 Nuclide 4 Note: All wipe san	1 2	e in units	5 of DPM	6 / 100	7 sq. cm.	8	9		Personnel To Prohibition of Radiation Le Contaminati < 100 DPA (ey Instrument:	rained on Mouth Pipetti evels				

ECOLOGY SERVICES, INC. ##N Secund St., Laurel, Maryland 2 (#II) 498-1514	gazar 🗨	Comp	any Nan	id:	40	FDA			
RADIA	TION SAFETY	SUR VE	Y			Building / Room: MOD WASTE			
Authorized Investigator	NAME:					Phone No.	Dute: 10-19-92.		
Surveyor:	NAME:					Phone No.	Survey Meter Us		
P H	TAB	KE				Complete Com	ontainers or / Freezer ntainers sipment t Paper Hood Flow Personnel Monitorin we Waste Management radionuclide Storage se of Gloves		
为 不是"是"的意思的	Wipe Sample Resu	Its:			int,	etc. Inventory	& Disposal Records		
LOCATION: 1 2	3 4 5	6 7	8	9	10		ecords Current		
Nuclide 1 P KIW -						Personnel			
Nuclide 2							on on Mouth Pipettin		
Nuclide 3						Radiation			
Nuclide 4							PM/100 sq. cm.		
Note: All wipe sample resul	ts are in units of DPM	/ 100 sq. cr	n.			Survey Instrumer			
Comments:		To discover the second of the second				00	Operational Available Other (Specify in Comments) EST Form HPS 1 Rev 1.0 I,		

	RAI	DIAT	ION .	S.A.F.I	ETY	SUR	VEY				Building / Room: MOD 1 107
Authorize	d Investig	gator:	NA	ME:							Phone No. Date:
Su	rveyor:			ME:	s (2					Phone No. Survey Meter U
			S	4EL	VE.	5					Compliance Items: Y - Compliance Y N N - Non-Complian Blank - Not Evalua
											Signs & Labels: Room Source Containers Refrigerator / Freezer L.S. Vials Waste Containers Cher Equipment Absorbent Paper Adequate Hood Flow Adequate Personnel Monitori Radioactive Waste Management Adequate radionuclide Storage Routine use of Gloves Routine use of Lab Coats Adequate use of Shielding Prohibition of eating, drinkin etc.
LOCATION	N: 1	2	Vipe 5	Sample 4	le Res	ults:	7	8	9	10	☐ ☐ Inventory & Disposal Record
Nuclide I											Personnel Trained
Nuclide 2							- 1				Prohibition on Mouth Pipettis
Nuclide 3											Radiation Levels
Nuclide 4											Contamination (Wipes) < 100 DPM/100 sq. cm.
Note: All s	wipe sampl	e results	are in	units o	f DPM	1/100	sq. cm				Survey Instrument:
Comments:	No	P	AM		oÉ.						Operational Available Other (Specify in Comments)

COLOGY SERVICES (O) Second St., Laurel, M (NI) 49%-1514		77		Co	mpany	/ Nan	nc:	40 V3	FDA			
R	ADIATI	ON SAF	ETY.	SUR	EY				Building / Room: MOD 1 GUIL			
Authorized Inves	tigator:	NAME:							Phone No.	Date: 10-19-92		
Surveyor.		NAME:	s C						Phone No.	Survey Meter U		
										s: Y - Compliance		
H 0	1	ASE	R						YN	N - Non-Compliano Blank - Not Evaluat		
HZ C I		RESCH	Lsc	- F	2FG	1#	2FG		Radioact Adequate Routine Adequate Adequate	ontainers quipment nt Paper e Hood Flow e Personnel Monitori ive Waste Manageme e radionuclide Storag		
LOCATION: 1	2	ipe Sampi	le Resul	/ts:	7	8	9	10	To see the control of	y & Disposal Record Records Current el Trained		
Nuclide 2									and the same	ion on Mouth Pipettin		
Nuclide 3									Radiation	n Levels nation (Wipes)		
Nuclide '									< 100 1	DPM/100 sq. cm.		
Note: All wipe sam	ple results	are in units	of DPM /	100 sq	. cm.				Survey Instrume	ent: D Calibration Current		
Comments:	lo Ri	Ain U	SE						00	Operational Available Other (Specify in Comments) ESI Form HPS.1 Rev 1.0 1		

COLOGY SERVICES 100 Second St., Laurel, A (3(1), 498-1514			Con	ipany Nan	ie:		FDA			
R	ADIATIO	ON SAFET	Y SUR V	EY			Building / Room: MOD 1 2321			
Authorized Inve	stigator:	NAME:	XXI R			Phone	No.	Date: 9-14-92		
Surveyor		NAME: WATS	C		Phone	No.	Survey Meter Use			
	DESK	B E N	C H	3	H 76 6 D B E S S T T T		Complia Signs & La Source Con Refrigerato L.S. Vials Waste Con Other Equi Absorbent Adequate Radioactiv Adequate Routine us Routine us	ntainers or / Freezer tainers opment Paper Hood Flow Personnel Monitoring e Waste Management radionuclide Storage		
	W	ipe Sample F	Results:		##************************************	0	etc. Inventory	& Disposal Records		
LOCATION:	1 2	3 4	5 6	7 8	9	10	Survey Re	cords Current		
Nuclide 1 14 C	<100						Personnel			
Nuclide 2						- 2	☐ Prohibition	n on Mouth Pipettin Levels		
Nuclide 3						1 1 1 1 1 1 1 1 1		ation (Wipes)		
Nuclide 4							< 100 D	PM/100 sq. cm.		
Note: All wipe sai	mple results a	are in units of I	PM / 100 sq	cm.		Surv	7 -/-	Calibration Current Operational		

COLOGY SERVIC On Second St., Lauren 2011 198-1514		707		ompan	, tullis			FD	A		
	RADIAT.	ION SAFET	Y SUR	VEY				Building / Room: NOD 1 2313			
Authorized Inv	vestigator:	NAME: BROWN	AUG-LA	Z.				Phone No.	Date: 9-14-92		
Survey	or:	NAME:	-20					Phone No.	Survey Meter Us 13 - 144-9		
LSC		LSC	RFG		H 00			O O	N - Non-Compliance Blank - Not Evaluate		
FRZ		5C L 5	8		BEN			Signs & Source (Refriger L.S. Viz Waste (Absorbe	Containers rator / Freezer als Containers quipment		
13c	4	5 6	2	10	FILT			Adequal Adequa	ate Hood Flow ate Personnel Monitoria ctive Waste Managemente ate radionuclide Storage e use of Gloves e use of Lab Coats		
		Wine Sample	() Results:					Prohib etc.	ate use of Shielding ition of eating, drinkin		
LOCATION:	1 2	Wipe Sample	Kesuits:	7	8	9	10	Survey	ory & Disposal Record Records Current anel Trained		
Nuclide 2									ition on Mouth Pipetti ion Levels		
Nuclide 3				-				Contar	mination (Wipes)		
Note: All wipe	sample resul	ts are in units of	DPM / 100	sq. cn				Survey Instru	0 DPM/100 sq. cm. ment: Calibration Curre		
Comments:								000	Operational Available Other (Specify in Comments)		

COLOGY SERVICES, INC. NO Secund St., Laurel, Maryland 2070 (101) 498-1514		ipany Name:	FDA				
RADIATIO	ON SAFETY SURVI	ΞY	Building / Room: MOD 1 2315				
Authorized Investigator:	NAME: BRONAUGH, T	2	Phone No.	9-14-92			
Surveyor:	NAME:		Phone No.	Survey Meter Use			
H000 7	TABLE	B E	Y N	S: Y - Compliance N - Non-Compliance Blank - Not Evaluated			
H 00 00		NI C	Signs & I Source C Refrigers L.S. Vial	Labels: Room Containers After / Freezer s containers			
A 0 5		(D) S X K	Radioact	nt Paper			
DOOR NOT LABOLED	2		Adequal	use of Gloves use of Lab Coats te use of Shielding tion of eating, drinking			
B	'ipe Sample Results:		Invento	ry & Disposal Records			
LOCATION: 1 2 Nuclide / P < 00	3 4 5 6	7 8 9 10	D Personn				
Nuclide 2			Prohibit	tion on Mouth Pipettin on Levels			
Nuclide 3				ination (Wipes)			
Nuclide 4			< 100 Survey Instrum	DPM/100 sq. cm.			
Note: All wipe sample results Comments:	are in units of DPM / 100 sq	. CIII.		Calibration Current Operational Available Other (Specify in Comments) ESTForm HTS.1 Rev 1.0 b			

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ECOLOGY SERVICES, 1 KN Second St., Laurel, Man (2011) 498-1514		17			C	ompan	y Nam	u:		FDA		
RA	DIATI	ON S	4FE	TY.	SUR	VEY				Building / Room: MOD 1 107		
Authorized Invest	igator:	NAM Ca	E: FSA	2	(3	SAFE	N	OFF 1	(E)	Phone No.	Date: 9-14-97	
Surveyor:		NAM	E: AMS	C						Phone No.	Survey Meter Use	
		S A	EL	VIE	۷						Y - Compliance N - Non-Compliance Blank - Not Evaluate	
DRAIN										Signs & La Source Co Refrigerate L.S. Vials Usaste Cor Absorbent Adequate Radioactiv Routine u Routine u Adequate	ntainers or / Freezer ntainers ipment Paper Hood Flow Personnel Monitorin ve Waste Management radionuclide Storage se of Gloves se of Lab Coats	
	И	Vipe Sa	mple	Res	ults:						& Disposal Records	
LOCATION: 1	2	3	4	5	6	7	8	9	10		ecords Current	
Nuclide 1										Personnel	l Trained on on Mouth Pipettin	
Nuclide 2										Prohibition Radiation		
Nuclide 3										Contamin		
Nuclide #										< 100 D	PM/100 sq. cm.	
Note: All wipe sam	ole results	are in u	mits of	f DPM	/ 100	sq. cm				Survey Instrume	nt: Calibration Current	
Comments:	RAN	\ ()	se								Operational Available Other (Specify in Comments) Est Form HPS 1 Rev 1.0 1	

X

Company Name: ECOLOGY SERVICES, INC. FDA 300 Second St., Laurel, Maryland 20707 (2011) 498-1514 Building / Room: RADIATION SAFETY SURVEY GUIL MOD Date: Phone No. NAME: KATBURNE Authorized Investigator: NAME: Phone No. Survey Meter Used MATTS. Surveyor: NA Compliance Items: Y - Compliance YN N - Non-Compliance 00 Blank - Not Evaluated LASER Compliance Items: D Signs & Labels: Room ☐ ☐ Source Containers B Refrigerator / Freezer L.S. Vials ☐ ☐ Waste Containers Other Equipment Absorbent Paper H Adequate Hood Flow Adequate Personnel Monitoring Radioactive Waste Management Adequate radionuclide Storage ☐ ☐ Routine use of Gloves Routine use of Lab Coats ISC REG RFG Adequate use of Shielding Prohibition of eating, drinking, Wipe Sample Results: ☐ ☐ Inventory & Disposal Records 10 ☐ ☐ Survey Records Current LOCATION: Personnel Trained Nuclide 1 Prohibition on Mouth Pipetting Nuclide 2 A Radiation Levels Nuclide 3 Contamination (Wipes) Nuclide 4 < 100 DPM/100 sq. cm. Survey Instrument: Note: All wipe sample results are in units of DPM / 100 sq. cm. Calibration Current Operational Comments: O O Available No RAM USE Other (Specify in Comments) ESI Form HPS. I Rev 1.0 1/92

COLOGY SERVICES, INC. RN Second St., Laurel, Maryland 2070 (RII) 498-1514	17	Company !	Vame:	FI	FDA				
RADIATI	ON SAFETY	SURVEY			Building / Room: MOD 1 / G-40				
Authorized Investigator:	NAME:			Phone N	lo.	Dute: 9-14-92			
Surveyor:	NAME: LATTS C			Phone N	10.	Survey Meter Us			
SINA	ICE			Complia Y N		Y - Compliance N - Non-Complianc Blank - Not Evaluate			
CENT.				00	Signs & Lat Source Con	tainers			
RFG			B E Z	00	Refrigerator L.S. Vials Waste Cont Other Equip	ainers			
FZR			C 4	00000	Radioactive Adequate r Routine use	lood Flow Personnel Monitorin Waste Managemen adionuclide Storage			
	Visco Company	7				use of Shielding of eating, drinking			
	Vipe Sample Resu			and the same		& Disposal Records			
LOCATION: 1 2	3 4 5	6 7	8 9 1	1 1	Survey Re-	cords Current			
Nuclide 1 Nuclide 2						on Mouth Pipettin			
Nuclide 3					Radiation l				
Nuclide 4						rtion (Wipes) PM/100 sq. cm.			
Note: All wipe sample results	are in units of DPM	/ 100 sq. cm.		Survey	y Instrument				
Comments:	Üse				00	Operational Available Other (Specify in Comments)			
						ESI Form HPS I Rev 1.0			

COLOGY SERVICES, INC. 2020 2021 2021 2021 2021 2021 2021 20	le .	Company Name:	FD	A
	ON SAFETY S	SURVEY	Building / Room	1 2418
Authorized Investigator:	NAME: BRONAI	06H, R	Phone No.	Date: 97-14-97
Surveyor:	NAME: WATES C		Phone No.	Survey Meter Use
1 25G		DESK	Compliance Item	ns: Y - Compliance N - Non-Compliance Blank - Not Evaluate
BE 9 10 DE	BENCH 2 SK	FLE FILE	Signs & Source (Refriger L.S. Vin L.S. Vin Absorbe Absorbe Adequa Adequa Adequa Radioac Routine Routine Adequa Prohibi	Containers ator / Freezer als containers quipment ent Paper te Hood Flow te Personnel Monitoring tive Waste Managemen te radionuclide Storage
	'ipe Sample Resu			ry & Disposal Records
Nuclide 1 \$ KIW -	3 4 5	6 7 8 9 10		Records Current nel Trained
Nuclide 2				tion on Mouth Pipettin
Nuclide 3			Radiati	on Levels nination (Wipes)
Nuclide 4			< 100	DPM/100 sq. cm.
Note: All wipe sample results Comments:	are in units of DPM ,	/ 100 sq. cm.		nent: Calibration Current Operational Available Other (Specify in Comments) EST Form HPS, I Rev 1.0 1/2

COLOGY SERVICES, INC. (X) Second St., Laurel, Maryland 26, 201) 498-1514	747	Compa	ny Name	g)		FDA	
RADIA?	TON SAFETY	SUR VE	Y			Building / Room:	1 2305
Authorized Investigator:	NAME: Branquis	L R				Phone No.	9-14-97.
Surveyor:	NAME: C					Phone No.	Survey Meter Us 1344-9
	BENCH GREG D	(3) CESK-1	4	00	D	Complia Complia Signs & La Source Co Refrigerate L.S. Vials Waste Cor Absorbent Adequate Adequate Radioactiv Adequate Routine us Routine us Adequate Prohibitio	N - Non-Compliance Blank - Not Evaluate fance Items: abels: Room ntainers or / Freezer stainers ipment Paper Hood Flow Personnel Monitorin we Waste Management radionuclide Storage se of Gloves se of Lab Coats
Karangar dan keca	Wipe Sample Resi	ults:				etc.	& Disposal Records
LOCATION: 1 2 Nuclide 1 \$\overline{\Pi}\$ \$\overline{400}\$	3 4 5	6 7	8	9	10	Survey R	ecords Current I Trained
Nuclide 2						Prohibition Radiation	on on Mouth Pipettin
Nuclide 3	24 50 00					1 2 2	Levels lation (Wipes)
Nuclide 4						< 100 D	PM/100 sq. cm.
Note: All wipe sample result	s are in units of DPM	1 / 100 sq. cr	n.				Calibration Current Operational Available Other (Specify in Comments)

ECOLOGY SERVICES, INC. JUN Second St., Laurel, Maryland 2070 (JUL) 198-1514	X) Second St., Laurel, Maryland 20707						
RADIATI	ON SAFETY S	URVEY				Building / Room:	1 / WASTE
Authorized Investigator:	NAME: CFSAN (S	AFEN	CF4	TOE)	Phone No.	9-14-92
Surveyor:	NAME: WARB, C					Phone No.	Survey Meter U. 13wl 44-9
RAW	TAAB					Compliance Items: Y N	Y - Compliance N - Non-Compliance Blank - Not Evaluat
[CAR]		2				Radioactiv Adequate Routine us Routine us Adequate	or / Freezer stainers sipment Paper Hood Flow Personnel Monitoria re Waste Manageme radionuclide Storag se of Gloves se of Lab Coats
H - H - H - H - H	lipe Sample Result	ts:				1 /	& Disposal Record
LOCATION: 1 2	3 4 5	6 7	8	9	10		ecords Current
Nuclide 1 P 40						Personnel Prohibitio	Trained on on Mouth Pipettir
Nuclide 2						A D Radiation	
Nuclide 3							ation (Wipes)
Nuclide 4						< 100 D Survey Instrumen	PM/100 sq. cm.
Note: All wipe sample results Comments:	are in turns of DF MT	roo sq. citt				00	Calibration Current Operational Available Other (Specify in Comments)
							ESI Form HPS 1 Rev 1.0

(X) Second St., Laurel, Maryland 2074 (XII) 49X-1514		FDA
RADIATI	ON SAFETY SURVEY	Building / Room: MOD 1 / 3404
Authorized Investigator:	NAME: SISTARE, F.	Phone No. Dute: 9-14-92
Surveyor:	NAME: Wans C	Phone No. Survey Meter U
B T F	LSC 9 10 BENCH BENCH HOUSING	Compliance Items: Y - Compliance Y N N - Non-Compliance Blank - Not Evaluat Compliance Items: Signs & Labels: Room Source Containers Refrigerator / Freezer L.S. Vials Waste Containers Other Equipment Absorbent Paper Adequate Hood Flow Adequate Personnel Monitorin Radioactive Waste Manageme Adequate radionuclide Storag Routine use of Gloves Routine use of Shielding Prohibition of eating, drinking
LOCATION: 1 2 Nuclide 1 P	### Sample Results: 3	etc. Inventory & Disposal Record Survey Records Current Personnel Trained Prohibition on Mouth Pipettin Radiation Levels Contamination (Wipes) < 100 DPM/100 sq. cm. Survey Instrument: Calibration Curren Comments Comments)

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RADIATION	SA	FETY	SUR	VEY	1				81	DG CV	M	ROO	M NO.	
AUTHORIZED INVESTIGATOR	NA	N 15	first initia	J)				PHON	IE NO).	DATE	month,	day, year	1
SURVEYOR	NA NA	Annual State of the Control of the C	, first initie	4)				PHON	IE NO) .	SURVE	Y MET	ER USED	Three w
	CARLES TO	S. S. S. S. S. S. S. S. S.	11 THE RESERVE THE REAL PROPERTY.	ENDMALL U	THE PROPERTY OF THE	E-greguect - des	e vige to a serie.	00	OMPL	IANCE	EITEMS		OMPLIAN IOLATION	
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D							100	5		7) Abs	er equip		n radion u	cide
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									TI	[18] 5	went ory ! urvey red era onn el	cords cu	urrent	
			NOW AND SAFE SAFE SAGE SAFE	TORRORS LYSIS			C PARAMENT	SHUMBLER	1	(20) P	rohibition omidor st	on mo	uth pipe!	ting uire-
SMEAR RESU				ther	nuclide	e(a) q	own ti	ne g		(22) F	ments Radiation 1	levels <	2.5 mR/h	
LOCATION 1	2		4 5	6	7	8	g	10			contamina < 100 dpr celibration	n		
NUCLIDE 1										(25) 5	Survey m Survey m	etera op	entional	
NUCLIDE 2										(27)	Other (SF	PECIFY	IN REMA	1
NUCLIDE 3									METE	H 1	METE	H Z	METER	
	1				1									

No RAM USE

	N SAFE	TV SI	JRVEY					BLDG	- 1	ROOM NO.
RADIATIO	NAME	(last, first i	nitial)			PHO	l	NO.	DATE (month, day, year)
INVESTIGATOR SURVEYOR	and the same of th	(lest, first)				PHO	ONE	NO.		Y METER USED
	CLE O CHRISTIAN PRINCIPAL		pored schools objected to broke		OR THE MANAGE POPUL		COM	PLIANCE	MOST STATE OF THE PARTY OF THE	Y=COMPLIANCE N=VIOLATION
	NO	u.					Y			
									s & lable	
						t	+	(3) Refr	rce conta igerator ()	
						1	-	(4) LSC (5) Was	. Mals te contair	ners
						-	-		er equipn orbant pa	nent sper (on radion uclid
						1		us	e areas)	
						ł		(9) Hoo		in calibration
								est .	lequate p nonitoring	ersonnel external
RFR								(11) Ra	dioactive	, waste managemen adionuclide storage
The second secon							-	(13) Ro	utine us	e of gloves
							-			e of lab coats if required
								(16) Pr		of eating, drinking
							0000000	(17) Inv	ventory / c	disposal records
									IFUAU FARI	
				F				(19) Pe	ers onnel t	
				E				(19) Pe (20) Pr	ers onnel to o hibition	trained on mouth pipetting
SMEAR RESU			in the nucli	de(s) de	own the	2		(19) Pe (20) Pr (21) Co	ers onnel to ohibition om dor sto nents	trained on mouth pipetting trage meets require
SMEAR RESU			in the nucli	de(3) de	own the	e	-	(19) Pe (20) Pr (21) Co m (22) Re (23) Co	ers onnel to hibition ornidor stonents adiation le	trained on mouth pipetting trage meets require evels <2.5 mR/hr ion (smears)
				de(s) do	own the	e 10		(19) Pe (20) Pr (21) Co m (22) Re (23) Co	ers onnel to o hibition ornidor sto nents adiation le	trained on mouth pipetting trage meets require evels <2.5 mR/hr ion (smears)
side of the table	All smears	100 cm ²)					-	(19) Pe (20) Pr (21) Cc m (22) Re (23) Cc (23) Cc (24) Ce (25) St (26) St	ers onnel to ohibition omidor stonents adiation te ontamination all bration oursey met urvey urvey met urvey urvey met urvey u	trained on mouth pipetting trage meets required vels < 2.5 mR/hr ion (smears) current ters operational ters available
side of the table LOCATION 1 NUCLIDE 1	All smears	100 cm ²)						(19) Pe (20) Pr (21) Cc m (22) Re (23) Cc (23) Cc (24) Ce (25) St (26) St	ers onnel to ohibition omidor stonents adiation te ontamination all bration oursey met urvey urvey met urvey urvey met urvey u	trained on mouth pipetting trage meets required evels < 2.5 mR/hr ion (smears) current ters operational ers available ECIFY IN REMARKS

No RAM USE

Rev. Oct 1990

ECOLO	GY S	SERV	/ICE	S,	IN	IC.	CC	MPAN	IY NAME	F	SA	
RADIATION	SAFET	Y SUF	RVEY				В	LDG B	RF	1	DM NO EST CO	rr.
AUTHORIZED INVESTIGATOR	NAME (I	ast, first init	ial)			PHON	VE N	٥.		-	, day, year	
SURVEYOR		ast, first init	ial)			PHON	VE N	0.	SURVE		ER USED)
	orth orr			Marina Jan	ar emene 2 strangen	C	ОМРІ	LIANCE	ITEMS		COMPLIAN	
To LOADING DOCK N SMEAR RESULT side of the table. All	S (in DPM		the nuclid	le(s) do	own th			2) Sour 3) Refr 4) LSC 5) Wess 6) Oth 7) Abs as 8) Ade 9) Hood 10) Ad 11) Re 12) Ac 13) Re (17) Inv (18) St (19) Pe (21) Co (22) Re (23) Co (22) Re (23) Co (22) Re (23) Co (22) Re (23) Co (23) Co (23) Co (23) Co (23) Co (24)	te container equipment are equipment per equipment per eareas) quate houd air flow lequate per equipment are using leding, it is a little and a moking a little are and a little are a little are a little and a little are a little and a little are a little are a little and a little are a little are a little and a little are a litt	iners freeze ners nent uper (in cai person) waste adionu e of gla if requ of eati ing disposi ords c trained on me evels c ion (si	on radionu w ibration nel extern rnanager iclide storn oves b coats ired ing, drinki al records urrent interes uth pipet meets req it 2.5 mR/hi mears)	nent age ing, ting
LOCATION 1	2 3	4 5	6 /	8	9	10		(24) Ct	alibration	curren	t perational	
NUCLIDES /		- >						(26) S	urvey mel	ters as		RKS
NUCLIDE 2						1	VETE	R 1	METER	3 2	METER	3
NUCLIDE 3												

ECO	LO	G'	Y	SE	RI	/1(CE	S,	I	IC		СОМРА	BMAN YN	FI	AZ	
RADIAT	ION	SA	AFE	ΓY	SUF	RVE	Υ					BLDG	RF		OM NO	NY.
AUTHORIZ INVESTIGA		N.	AME (last, f	irst init	ial)				PH	ONE	NO.		mont!	h, day, yea	r)
SURVEYO	R	N	AME (irst init	ial)				PH	ONE	NO.	SURVE L3	1	TER USE	
WEST 1	Fug	E .	3	1ELF		-	ELF				CON	IPLIANC	E ITEMS		COMPLIA!	
SMEAR RE side of the to LOCATION NUCLIDE D NUCLIDE 2				- 41		the 1	nuclid 7	e(a) d	own the			(2) Soil (3) Ref (4) LSO (5) Was (6) Oth (7) Ab: (8) Ad (9) Ho (10) A (11) R (12) A (13) R (14) R (15) S (16) P (17) In (18) S (19) P (20) P (21) C (25) S (26) S (27) C	ste container equipment or equipment of equate in equate	mers freeze ners ment aper (cod flo vin ca cers on g waste adionu e of ge e of la if requi of eal ing dispos ords c trained on mi orage evels curren ters o ters av ECIFY	on radional ow dibration and external external external dives al records urrent douth pipet meets required external valiable IN REMA	nent age ing, iting uire-
											ME	TER 1	METE	R 2	METER	3
NUCLIDE 3																

ECO	LO	G'	Y S	SE	RV	/IC	E	S,	IN	IC.		СОМРА	MAN YNA	EFT	SA	
RADIAT	ION	SA	AFET	Υ	SUF	RVEY	1	-				BLDQ	BRF		OM NO	w,
AUTHORIZ IN YESTIGA		N/	ME (last, fi	rat init	iel)				PHO	ONE I	VO.	DATE		h, day, yea	
SURVEYO	R		ME (rat init	ial)				PHO	ONE	40.	SURY L3		TER USED	
	an is an interest to the con-		Security and			an arrang de outagn	No	orth	arenged and re-		СОМ	PLIANC	CE ITEMS		COMPLIAN VIOLATION	
						40-	No Co	orr.	(YN					
						Co.		south covr	2 3 FOY YEARS	ng.		(2) So (3) Re (4) LS (5) We (6) Ot (7) Ab (10) A (11) F (12) A (15) S (16) F (17) In (18) S (19) F (use areas dequale h cod air flo Adequate monitorir Radioactiv Adequate Routine u Routine u Shielding Prohibitior and smo nventory Survey re Personne Prohibition	tainers I freeze ainers ment paper () nood flo w in ca person ng e waste radionu se of g se of le if requ n of eat king I dispos cords c I trainer n on m	on radionus w dibration anel extern c manager uclide stor doves ab coats aired ing, drink al records	nent age ing,
SMEAR R					,	the n	ucli d	e(3) d	own th	he	7	(22) F	ments Radiation Contamin		(2.5 mR/hi	
LOCATION	1	2	3	4	5	6	7	8	9	10		(24)	< 100 dp Calibration	m n currer	nt	
NUCLIDE!	Z100				\rightarrow							(26)	Survey m	eters a	perational vailable IN REMA	RKSI
NUCLIDE'2								# 400.00 m (M.) per			MET	informative restaura	MET	NAMES OF TAXABLE PROPERTY.	METER	STREET, STREET
NUCLIDE 3																

ECOLOGY SERVICES, INC. 300 Second St., Laurel, Maryland 207 (301) 498-1314	le .	Company Name:	FDA	
RADIATI	ON SAFETY SU	URVEY	Building / Room:	/LAB 18
Authorized Investigator:	NAME:		Phone No.	Date: 9-3-92
Surveyor:	NAME: WATTS, C		Phone No.	Survey Meter Used 13 w 144-9
FUGE	FZR RFG	DESK		Y - Compliance I - Non-Compliance lank - Not Evaluated
	1 8 /	10 DES2 2 3 H /// FUGE	Signs & Laboration Source Control Refrigerator L.S. Vials Waste Conta Other Equipm Absorbent Po Adequate Per Radioactive V Routine use of Routine use of Adequate use Prohibition of	iners / Freezer iners ment aper ood Flow rsonnel Monitoring Waste Management lionuclide Storage of Gloves of Lab Coats
100.000	in units of DPM / 100	7 8 9 10	Radiation Level Contamination < 100 DPM, Survey Instrument: Ca Av Av Out	rds Current ained n Mouth Pipetting vels n (Wipes) /100 sq. cm. libration Current erational

ECOLO	GY SERVICES,	INC.	COMPANY NAME TOA
RADIATION	SAFETY SURVEY		BLDGBRE ROOM NO.
AUTHORIZED INVESTIGATOR	NAME (last, first initial) SAPENZIA	PHONE	ENO. DATE (month, day, year)
SURVEYOR	NAME (last, first initial)	PHONE	SURVEY METER USED
		/ 00	MPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION
		Y	1
DESK		DESK	(1) Signs & lables : room (2) Source containers (3) Refrigerator/freezer (4) LSC vials
			(5) Waste containers (6) Other equipment (7) Absorbant paper (on radionuclide use areas) (8) Adequate hood flow
			(9) Hood air flow in calibration (10) Adequate personnel external monitoring (11) Radioactive waste management
	151NK		(12) Adequate radionuclide storage (13) Routine use of gloves (14) Routine use of lab coats (15) Shielding, if required
HOOD			(16) Prohibition of eating, drinking, and smoking (17) Inventory! disposal records (18) Survey records current
	OXID, CAB,	LSC	(19) Personnel trained (20) Prohibition on mouth pipetting (21) Corridor storage meets require-
SMEAR RESULT		down the	ments (22) Radiation levels < 2.5 mR/hr (23) Contamination (smears)
LOCATION 1	2 3 4 5 6 7 8	9 10	(100 dpm (24) Calibration current (25) Survey meters operational
NUCLIDE 1			(26) Survey meters available (27) Other (SPECIFY IN REMARKS)
NUCLIDE 2		ME	ETER 1 METER 2 METER 3
NUCLIDE 3			

No RAM USE

ECOL	OG'	Y	SE	RI	/IC	CE	S,	IN	IC.		СОМР	MAN	NAME	F	SA	
RADIATIO	N S	AFET	Υ	SUF	RVE	Υ					BLDĢ	BR	QF.		OM, NO C	57Y.
AUTHORIZED INVESTIGATOR		AME (last, fi	rat init	ial)				PHO	ONE	NO.		DATE (-	, day, yea	r)
SURVEYOR	N.	AME (and and the	rst init	ial)				PHO	BMC	NO.		SURVE L3 w	Y MET	ER USE	
			A P CLASSIC MANAGEMENT COMM		S TONIO PRODUCTION	100 000 000 000 000 000 000 000 000 000				СОМ	PLIAN	ICE	ITEMS		OMPLIAN	
SMEAR RESI	JLTS (in		1)	(fill in	FZR the r	Fz Puclid	R	cast 5 USC	Lac		(2) S (3) R (4) L (5) Y (6) C (7) A (8) A (9) H (10) (11) (12) (13) (14) (15) (16) (17) (18) (20) (21) (22) (23) (24) (25) (26)	Vestering SC Veste	e container equipment part part part part part part part par	iners freezes	on radion www. www. ibration nel extern manager clide storn oves b coats ired ng, drink al records urrent outh pipet neets req 2.5 mR/h mears) t perational	nent rage ing, iting juire-
NUCLIDE 2										ME	CANADO SERVICIO DE	1	METER	NASAWOWNESS	METER	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
NUCLIDE 3																

ECO		70	1	DI	111	A 1.		i,	11	11	J.		NY NAME	+ 013
RADIAT	ION	S	AFE	TY	SU	RVI	Y					BLDG	SRF	Mark In Coch
AUTHORIZI INVESTIGAT		N	AME	(lest,	first in	itial)				F	PHONE	NO.	DATE	month, day, year)
SURVEYO	9	N	1	(1831, TTS	first in	itial)				F	PHONE	NO.	SURVE	Y METER USED
	AS HE PROPERTY.			NE PROCESSOR		NEC STREET, CHEST	BERTHANNOY, O	SHARE BACKS	LONVERNIEWA	WHI MUS	COA	APLIANC	E ITEMS	Y=COMPLIANCE N=VIOLATION
									1		YH		(.)	
									h		1	(2) 504	ns & lable irce conta rigerator/	in era
									E				vials ite contair er equipn	
				. ,					F		才	(7) Abs		per (on radion uclide
				5					,		1	(9) Hoo		in calibration
												r	nonitoring	ersonnel external waste management
					19	-					7	(12) Ac	lequate n	adionuclide storage e of gloves
5					(4)				S		4	(15) Sh	ielding, i	of lab coats frequired of eating, drinking,
			2		3				FE	1		a	nd smoki	
				(1)	1				7		1	(19) Pe	rs onn el t	
MEAR RE	SULT	S(in	DPN	1)	(fill in	the	nuclid	e(s) d	own th	MATERIAL E	1	[21] Co		on mouth pipetting rage meets require-
de of the ta							7					(23) Co	ntaminati	vels < 2.5 mR/hr on (smears)
CATION	1	2	3	4	5	6	7	8	9	10		(24) Ca	100 dpm libration o	
1 1	<100				>	-						(26) Su	rvey met	ers operational ers available :CIFY IN REMARKS)
ICLIDE 2											MET	ER 1	METER	AND THE STREET, STREET
CLIDE 3													All the state of t	The second secon

	UU	Y i	OLI	RVI	UL	5,	11	VC.		COMPAN		FI	A	
RADIATIO	N S	AFET	Y S	SURV	EY					BLDG BI	RF		DIM NO.	rl
AUTHORIZED INVESTIGATOR		AME (last, firs	t initial)				PHO	ONE	NO.	DATE (r	nonth	, day, year	
SURVEYOR	N	AME (- /	t initial)				PHO	DNE	NO.	SURVEY L3W	1	ER USED	
	*	A COMMITTEE WAY		2000年的AXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	and the second	14			СОМ	PLIANCE	ITEMS		COMPLIAN	
X X	* X X	RAV	3	2	V	To lest			YN	(2) Sour (3) Refri (4) LSC (5) Wash (6) Othe (7) Absous (8) Ade (9) Hoo (10) Ad (11) Ra (12) Ad (13) Ro (14) Ro (15) Sh	e contain er equipm orbant pap e areas) quate hoo d air flow equate per nonitoring dioactive v equate ra utine use ielding, if	ers ers ent oer (od flo in cal ers on waste dionu of gl of la requ	on radionus w ibration nel externs managem clide stora oves b coats	al en
*				ng anning strange processes					4	(17) Inv (18) Su (19) Pe (20) Pro (21) Co	nd smokin rentory i di rvey recor rsonnel tr phibition o midor stor	spose rds cr ained on mo		ing
	All sme	ars 10	0 cm ²)	fill in the						az (17) Inv (18) Su (19) Pe (20) Pro (21) Co m (22) Ra (23) Co	nd smoking entory? di rvey reconsonnel tropition of midor storents diation leventamination	sposs rds cr ained an mo age r	urrent outh pipett neets requ 2.5 mR/hr	ing
SMEAR RESU			- 10	fill in the	nuclid	e(s) d	own th	10		ar (17) Inv (18) Su (19) Pe (20) Pro (21) Co m (22) Ra (23) Co (24) Ca	nd smoking entory? di rvey recon reconnel tropicion o midor storents diation levontamination o dipmilibration o	sposserds creatined on more age relation (se	urrent outh pipett neets requ 2.5 mR/hr mears)	ing
side of the table	All sme	ars 10	0 cm ²)						***	(17) Inv (18) Su (19) Pe (20) Pro (21) Co m (22) Ra (23) Co (24) Ca (25) Su (26) Su	nd smoking entory? discretely recommend to midden store ents distribution to intermination to the midden of the midden of the midden of the meter meters.	sposs rds crained ained an morage r vels con (si umeni ers opers av	urrent outh pipett neets requ 2.5 mR/hr mears) t perational	in (

NOTE: LABOURD FREEZER ON DOCK, WIPE # 5 THERN W REV. DOI 1990 LIQUID DRAINING FROM FREEZER

AUTHORIZED INVESTIGATOR SURVEYOR	NAME (last, f	irst ini		Y					BLDG_	man man	RO	OM NO.	
SURVEYOR	NAME (last, I		tial)		Appropriate part of the contract of the contra					SKI-		6	
	1 1 1 1	24						P	HONE	NO.		mont!	h, day, yes	<i>t</i>)
Auto-	ATACASTICATION SERVICES AND ACTUAL PROPERTY OF THE PERSON NAMED IN COLUMN NAME	MS.	irst ini	tial)				F	HONE	NO.	SURVE	Y ME	TER USE)
clave						<	51	υK	CON	APLIANC T	E ITEMS		COMPLIA VIOLATIO	
3 2		4			()		ELI			(1) Sign (2) Sou (3) Ref (4) LSO (5) Was (6) Oth (7) Abs (8) Ads (9) Hoo (10) Ac (11) Re (12) Ac (13) Ro (14) Ro (15) Sh (15) Sh (15) Pr	ns & lable: unce contain ingerator/fi C vials ste contain iter equipm sorbant pal se areas) equate hose od air flow dequate per monitoring adioactive is dequate ra outine use including, if rohibition of uncersonnel tra outine or ersonnel tra outine or	ners reeze ers ent per (on radionu w ibration nel extern managen clide ston oves b coats ired ng, drinki	nent age
MEAR RESULTS (ide of the table. All sn				the	n ucli d	e(s) d	own th	e	4	(22) Rs	orridor stor nents adiation lev ontaminatio	els (2.5 mR/hr	
OCATION 1 2	3	4	5	6	7	8	9	10		(24) Ca	100 dpm dibration c	urrent		
UCLIDE 3 KIOO -								÷		(26) Su	urvey mete urvey mete ther (SPE	17.8 ET	ailable	₹KS
UCLIDE 2									MET	THE REAL PROPERTY.	METER	понавания	METER	3

ECOL	00	Y	Si	R	VI	CE	S,	II	VC	1	1000	NY NAME	F	PU	
RADIATIO	N	SAFE	TY	SU	RVE	Υ					BLDG .	B8		00M NO.	2
AUTHORIZED INVESTIGATOR	3	NAME	(last,	first in	itial)				P	HONE	NO.	NAME OF TAXABLE PARTY.	mont	h, day, yer	ar)
SURVEYOR		NAME	(last, 1	200	itial)				PI	HONE	NO.	SURVEY L3	Y ME	TER USE	
	/		TE BESINET THE BUILD	ASS BANKSTON	en annovement ved	CORRECTOR SPECIAL RANGE				CO	MPLIANC	EITEMS		COMPLIA	
CAB 2 FLAMM. CAB.	3 5 7 [1 WE		R		OR			FC	Y N	(1) Sign (2) Sou (3) Refi (4) LSO (5) Was (6) Oth (7) Abs (8) Ade (9) Hoo (10) Ao (11) Re (12) Ao (13) Ro (14) Ro (15) Sh (16) Pr	ns & lable: irce contain igerator / // . vials ite contain er equipm orbant pa le areas) quate hor dequate pr nonitoring dioactive dequate ra putine use sielding, if ohibition cond smokin ventory / di irvey recon	ners reeze ners ners ners ners ners ners ners ner	on radions ow alibration nnel extern e manager uclide stor lloves ab coats uired ing, drink al records	nal nent
SHELVES SMEAR RESU	REAL PROPERTY OF STREET	in DPN	Л)	(fill in	the	nuclid	e(a) d	own t	A A B	4	(19) Pe (20) Pr (21) Co	ers onnel tr ohibition o omidor stor ents	raine d on mi rage i	d outh pipet meets req	uire-
side of the table	-			-		T				1	(23) Co	diation leventamination 100 dpm			
LOCATION	1 2	3	4	5	6	7	8	9	10		(24) Ca	libration c irvey mete			
NUCLIDE B <	<u> </u>								>		[(26) Su	rvey mete her (SPE	וא פום	railable	RKS)
NUCLIDE 2										ME	TER 1	METER	2	METER	3
NUCLIDE 3	1														

ECO	LO	G	Z S	SE	RV	/[(CE	S,	IN	IC.		СОМРА	AAN YM	IE F	DA	
RADIATI	ОИ	SA	FET	Υ	SUF	RVE	Υ					BLDG.	-B8	1	OM NO.	
AUTHORIZE INVESTIGAT		N/	ME (last, fi	rst initi	el)				PHC	NE	NO.	DATE	(mor	th, day, y	ear)
SURVEYOR	7	N	ME (irat init	ial)				PHC	NE	NO.	SURV	YEY MI	ETER US	
	School of Gentle, Since	kramet lature pr	SALSSOCIE SUIC	STATE OF THE STATE		norms etilenes	NEW AND PARTY	e per l'abbender a	CLOUR ESCAPE		COM	IPLIANC	E ITEM		=COMPLI	
SMEAR RE side of the ta LOCATION NUCLIDE 12	SULT		DPN		100	the r	nuclid 7	(e) d	own th			(2) So (3) Re (4) LS (5) We (6) Oth (7) Ab (7) Ab (10) A (11) A (12) A (14) F (15) S (16) F (21) C (22) F (23) C (24) C (25) S (26) S	equate od air fladequate monitoriadioactive dequate foutine in the foutine of the four the fo	ntainers rifrees rainers pment paper) hood f ow in o perso radio use of use of use of if re- radio use of storage levels ration (om neters pecters PECIF	(on radional low calibration onnel extended at low coats quired at low current ed mouth pipe meets remeats) ent operation available y IN REM	emal ement orage nking, ds etting equire-
NUCLIDE 2											ME	TER 1	MET	ER 2	METE	R 3
NUCLIDE 3											H					

ECOI	O	G'	Y	SE	RV	VI(CE	S,	II	1C		:ONIPAI	NY NAME	+7	SA	
RADIATIO	ON	SA	AFE1	Υ	SUI	RVE	Υ					BLDGF	-B8	ROO 3	0M NO. 756	
AUTHORIZED IN YESTIGATO		N	AME (last, fi	nt inil	tial)				PH	ONE I	VO.		nonth \-	day, year)
SURVEYOR		N	ME (400	tiel)				PH	ONE I	40.	SURVEY		ER USED	
	e Colonia de Colonia	(IV)	C	4727	######################################	ANTHONY COL	ESOCIOENTE UN		i Z	0	сомі	PLIANCI	EITEMS		COMPLIAN VIOLATION	
								-	15		Y H					
		Ţ		2		(3	>-		FZ	R		(2) Sou (3) Refi (4) LSC		n ers reeze		
		L	7				5		/			(6) Oth (7) Abs	e areas)	ent per (on radion uc	lide
		6					7		1	<i>j</i>		(9) Hoo (10) Ac (11) Re (12) Ac	monitoring adioactive dequate ra	in ca erson waste dionu	libration nel externa managem uclide stora	ent
N - 7 K			8				0		the state of	Er SVER		(14) Ri (15) Si (16) Pr (17) In	and smokir ventory / di	of la requ of eat ng ispos	b coats lired ing, drinkir al records	ng,
CART				/ 1	5				1		7	(19) P (20) Pi	urvey reco ersonnel tr rohibition (omidor stor	rained on mi		ing uire-
SMEAR RES				- 40		the	nuclid	e(3) (lown t	he		(22) R	nents	vels (2.5 mR/hr	
LOCATION	1	2	3	4	5	6	7	8	9	10		(24) C	100 dpm alibration c	urren	it	
NUCLIDE B	a									>		(26) S	urvey met urvey met ther (SPE	ers a		RKS
NUCLIDE 2											MET	CONTRACTOR DESCRIPTION OF THE PERSON OF THE	METER	ORNERS ME	METER	3
NUCLIDE 3																autocor/Orlino

ECOLOG	GY S.	ERVIC	CES	, IN	IC.	COMPA	NY NAME	FA	4	
RADIATION	SAFETY	SURVE	Y			BLDG	B8	ROOM 22		
AUTHORIZED INVESTIGATOR	NAME (last,	first initial)			PHON	IE NO.		month, d - 11-9)
SURVEYOR	NAME (last,				PHON	IE NO.	SURVE	Y METER	USED	
	HE	6	PENNISA NIPERING INC			OMPLIANC	EITEMS		MPLIAN	
BERCH BESULTS	RFR TBL	(fill in the n	(5) Y	FZ'	TUGE R	(1) Sign (2) Sou (3) Ref (4) LSO (5) Was (6) Oth (7) Abs (8) Add (9) Hoo (10) Ac (11) Ref (12) Ac (13) Ri (14) Ri (14) Ri (15) Si (16) Pr (17) In (18) S (19) Pr (20) Pr (21) C	ns & lable arce containing erator / file vials at e containing er equipmed areas) equate hood air flow dequate per equipmed adioactive dequate recontine use hielding, in the containing and smokill ventory / durvey recontained areas on the lable or in the containing or it is to hibition or it or it is to hibition or it or it is to hents	iners freezer ners nent per (onr od flow in calibra ersonnel waste ma adionuclic e of glove e of lab of frequire of eating ng fisposal r ords curre rained on mout!	alion externa anagem de stora es oats d , drinkir ecords ent	ent ge
side of the table. All s			1			(23) C	adiation le ontaminati : 100 dpm	on (sme		
LOCATION	2 3 4	5 6	7 8	9	10	(24) C	alibration of urvey met	current	ational	
NUCLIDE 1 CICO					\geq	[26] S	urvey met ther (SPE	era availa	ble	KS)
NUCLIDE 3					N	IETER 1	METER	2 M	ETER	3

RADIATION	SAFETY	SURVE	Υ		BLDG	-B8		OM NO.	
AUTHORIZED INVESTIGATOR	NAME (last	, first initial)		F	HONE NO.			n, day year)
SURYEYOR	NAME (last	, first initial)		F	PHONE NO.	1,000	EY MET	TER USED	
	-5C		T-Tree	Bat /	COMPLIAN	CE ITEMS		COMPLIAN VIOLATION	
	3		LECTON 16	ZAD TAPAS BAT BAT	(2) S (3) R (4) L (5) W (6) O (7) A (8) A (9) H (10) (11) (12) (13) (14)	use areas dequate h ood air flo Adequate monitorir Radioactiv Adequate Routine u Routine u	tainers I freeze ainers oment paper () nood flo ow in ca person ng re waste radionu	on radion uc libration nel externa managem uclide stora loves to coats	al en
	FLOR	SIANK THE SECRET	8 nuclide(s) d	FZTO RFTO OWN the	(16) (17) (18) (19) (20) (21)	and smo Inventory: Survey re Personne Prohibition Comidor s ments	n of eat king I dispos cords c I trained n on mi torage	ing, drinkir al records urrent d outh pipett meets requ	ing
side of the table. A		m ²)				Contamin	alion (3	(2.5 mR/hr mears)	
OCATION 1	2 3 4	5 6	7 8	9 1	(25)	< 100 dp Calibration Survey m Survey m Other (S	n currer leters o leters a	perational	₹K:
AUCTIDE 3					METER	1 MET	ER 2	METER	

SINK CONTAMINATED; 17500pm

METER SN 96868 OUT OF CAL.

MULTIPLE AZEAS CA CONTAMINATION THROUGHOUT LAB

Rev. Oct 1990

(3653 dpn/20cm2 to 30,574 dpm/20cm2)

ECOLO				-			U,	11	10	*	BLDG		FO BO	DA OM NO.	
RADIATION	SA	AFE	IY	SU	RVE	Υ					1	B8		846	
AUTHORIZED INVESTIGATOR	N/	AME (last, f	int ini	tial)				PH	ONE	NO.	DATE		h, day yes	u)
SURVEYOR	1.5	AME (100	tial)				Ph	HONE	NO.	SURVEY 13	ME	TER USE	0
	CONT. Sept. Property			gas an year an		PERMIT	INC	LL.	HO	CON	APLIANCE	EITEMS		COMPLIA!	
			T	-		7	10		000	Y					
ESK								-		1		rce contai		om	
					- /				1	1	(4) LSC			er	
								9		1	(6) Oth	te contain er equipm	ent	on m di on	(ali d
2					j	4			1		us	e areas)		on radion u	CIIQ
								8		1	(9) Hoo	quate how	in ca		nol
											r	nonitoring		managen	
						1				7	(12) Ad		dionu	uclide stor	
			INI	/	1			1		4	(14) Ro	utine use ielding, if	of la	b coals	
						-	1		/-		(16) Pr	ohibition o nd smokir	of eating	ing, drink	
	3		4				(c)	27	6	1	[18] Su	rvey reco	rds c		
					RFF	2 FZ	R		8	1	[20] Pr		n m	outh pipet meets req	
SMEAR RESULT	179				ther	nucli d	e(3) d	own t	he	1	m	ents		2.5 mR/hr	
side of the table. A			-							1	(23) Co	ntamination 100 dpm			
OCATION 1	2	3	4	5	6	7	8	9	10	4	(24) Ca	libration curvey mete			
+ K100			Decrease to						1>	A] (26) Su	rvey mete	ers 8.4		RKS
NUCLIDE 2										ME	TER 1	METER	CAL DISCOURSE OF THE PERSON NAMED IN	METER	3
AUCTIDE 3															

ECOLO	Q.I.		11.0	7 .2.	~ A	,			-	0.00		-	DA	
RADIATION	SAFE	TY	SU	RVI	EY					BLDG	B8		6448	3
AUTHORIZED INVESTIGATOR	NAME	(last, i	irst in	itial)					PHO	NE NO.	DATE	many in constraint	th, day, ye	A Distance of the last
SURVEYOR	NAME A	(last, 1	30	itial)					PHO	NE NO	SURVE		TER USE	D
	Paramatan da	nech-min. (SAANSAA)	/		AND LOCATION AND A	ANTA PROPERTY.	one remote	CHANNAN	C	OMPLIANCE	EITEMS		COMPLIA VIOLATIO	
FURE		1	6		-7	1	-77	K	Y	H				
	4		(3)			L			-	(2) Sou	ns & lable rce conta	ners		
DESK									E	(4) LSC			er	
IZCON,	10.00						1 2	5C	1	(6) Oth	te contain er equipm orbant na	ent	on radion (uclida
) (us	e areas)			2011 0 0
		3					-			(9) Hoo	d air flow	in ca		nal
								h		(11) Ra	nonitoring dioactive	wast (e manager	ment
										(13) Ro	utine use	of g		age
SINK		2					1	SC	-	(15) Sh	utine use ielding, if	requ		in a
							-		-	8.	nd smokin	g	al records	
FUGE		i.		/			4	sc.		(18) Su	rvey reco	rda c	urrent	
SMEAD DEGIN TO	MARKET CONTRACTOR	CONTRIBUTE O	Property of		Management	PROPERTY	CONTRACTOR OF	ON IONIO	-	(21) Co	midor stor		outh pipet meets req	
SMEAR RESULTS				the	nuclid	e(s) d	own t	he		(22) Ra			2.5 mR/hr	
LOCATION 1	2 3	4	5	6	7	8	9	10		(ntaminatio 100 dpm libration c			
NUCLIDE TO ZIO			->						E	(25) Su (26) Su	rvey mete rvey mete	rs of	perational railable	
NUCLIDE 2								-	М	(27) Ot ETER 1	her (SPE	HOUR LANGUAGE	IN REMAR	HII/KARDMIN
NUCLIDE 3				-	-		-	-	-		11121211		1112121	

ECO	LO	G'	Y	LE	RV	II	CE	S,	IN	IC.			ANY NAME	F	A	
RADIAT	ION	SA	VEET	Y	SUF	₹VE	Υ					BLDG.	3RF	1 6	ON NO.	Sock
AUTHORIZI INVESTIGAT		N/	AME (last, fi	rst initi	al)				PHO	ONE	NO.	DATE	ni contra di inti di di Ameri	h. day, ye	
SURVEYO	R	1.3	AME (100	rat initi	al)				PH	ONE	NO.	2 2000	Y ME	TER USE	D
	X		ng Sarag Patronika	TARONIACIANUS BIDN	anar abeec above			18			COM	PLIAN	CE ITEMS		COMPLIA VIOLATIO	
SMEAR REside of the to	SULT	S (in		3	3.	the r	Co	e(3) d	2 cwn il		N XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	(2) So (3) Re (4) LS (5) W (6) Ott (7) Al (8) Al (9) H (10) A (11) F (12) A (15) H (15	gns & lable ource containing erator / SC vials aste containing erator / SC vials aste containing erator / SC vials aste containing erator / SC vials areas) dequate in monitoring erator / SC vials erator / SC v	ainers freeze ners ment aper (od flo win ca persor g waste radion e of g e of la if requi of eal ing dispos ords o traine on m orage evels tion (s currer iters o eters a	on radion ow dibration mel exter e manage uclide ato iloyes ab coats uired ting, drin al record urrent d outh pipe meets re <2.5 mR/ emears) nt perations yailable	mel ement erage king, s etting quire- hr
NUCLIDE 2											ME	TER I	CARNOTTE STATE OF THE STATE OF	UNITED STATES OF THE PARTY OF T	METER	the market make pro
NUCLIDE 3																

ECOLO	G'	Y	Sid	RV	11	CE	S,	II	V(].	COMP	AN	Y NAME	7	A	110000000000000000000000000000000000000
RADIATION	Si	AFE	TY	SUF	VE	Υ					BLDG	BI	27-	RO	OM NO.	
AUTHORIZED INVESTIGATOR	N	AME (last, I	inst initi	el)				F	HONE	NO.		DATE	mont	h, day, ye	ar)
SURVEYOR	N		last, I	linst initi	al)				F	HONE	NO.		SURVEY	ME	TER USE	D
Auto-	BURSHINGONS!	S. (1984) - (1994) - (1994)		AURE PORTE DE LA COMPANION DE	er en	MANAGARIAN	2005.00 A 600 M	5	NK	CON	APLIAN	ICE	ITEMS		COMPLIA	
clave		-					0.007030000	170		YX						
16								(8)		1	(2) 5	oun	& lables le contai	ners		
(9)					-					1] (4) L	SC	geratorifi via 3 e contain		r	
						9				1	(6) 0	the	r equ.pm	ent	on radion	uclid
									-			use	arear)			
(4)-	12	التسيد						1		1	(9) H	ood Ade	air flow quate pe	in ca		nal
							10	ľ.,	100	X		Rad			manage	
								1		1	[13]	Rou	itine use	of g		rage
3								1		1	(15)	Shi	itine use elding, if	requ		ring
	L	-	2									8.0	d smokin	9	al records	
			Sec				2.1	· · ·		7	(18)	Sur Per	vey record sonnel tr	ds c ainec	ur ent	
		MANUAL MA			MACAMITY TO	No. of the Party o	nerreckistens	EL	CANADA	4		Cor	ridor stor		outh pipe neets rec	
MEAR RESULT:			1	(fill in	ther	nuclid	e(3) d	own ti	he	14		Rac			2.5 mR/h	t
DCATION 1	2	3	4	5	6	7	8	9	10	1		< 1	ntaminalio 00 dpm bration c			
UCLIDE 1										1	(25)	Sur		rs of	erational	
UCLIDE 2									-	-	(27)		er (SPE	CIFY	IN REMA	PROGRAMO
UCLIDE 3									-	ME	TER 1		METER	2	METER	3

AUTHORIZED NAME (last, first initial) SURYEYOR NAME (last, first initial) NOT A CONT. NOT A	RADIAT	NOI	SA	AFET	Y	SUF	(VE	Y					BLDG	BR	F	1	DM NO.	rr.
North Corr. COMPLIANCE ITEMS Y=COMPL N=VIOLAT Y X (1) Signs & lables room (2) Source containers (3) Refrigerator / freezer (4) L SC vals (5) Waste containers (6) Other equipment (7) Absorbant paper (on radio use ereas) (8) Adequale hood flow (9) Hood air flow in calibration (10) Adequale personnel ext monitoring (11) Radioactive waste managed (12) Adequale radionuclide si (13) Routine use of lab codes (14) Routine use of lab codes (14) Routine use of lab codes (15) Shielding, if required (16) Prohibition of ealing, directly and smoking (17) Inventory / disposal record (18) Survey records current (19) Personnel trained (20) Prohibition on mouth pig (21) Comidor storage meets rements (22) Radiation levels < 2.5 mP (23) Contamination (smears) (23) Contamination (smears) (24) Caliuration current (25) Survey care operation (26) Survey care operation (27) Survey care operation (28) Survey care operation (29) Survey ca			N/	ME (last, fi	rat initi	al)				PH	ONE	NO.		ATE	nonth	, day year	
N=VIOLAT Y N	SURVEYO	OR.	1 1				al)				PH	ONE	NO.	5			ER USEN	
(1) Signs & lables : room (2) Source containers (3) Refrigerator / freezer (4) LSC vials (5) Waste containers (6) Other equipment (7) Absorbant paper (on radio use areas) (8) Adequate hood flow (9) Hood air flow in calibration (10) Adequate personnel exto monitoring (11) Radioactive waste managed (12) Adequate radionuclide signs and smoking (13) Routine use of gloves (14) Routine use of gloves (15) Shielding, if required (16) Prohibition of eating, dispersion of eating, dispersio		N.	lorth lorr	2-10		4	ANTERS SERVERS		ERRIA ECINENA	de Sant Plant de Constitute de Sant Paris de			PLIAN	CEI	TEMS			
NUCLIDE 2 (26) Survey meters available (27) Other (SPECIFY IN REA	SMEAR R side of the t	ESULT table. Al	FZR FZR FZR (c)	DPN ars 10	1) 10 cm ²	5							(2) SG (3) RG (4) LS (5) W (6) OOI (7) AI (8) A G (9) H (10) / (11) F (12) / (13) I (14) I (15) (16) (17) I (18) (19) (20) (21) (22) (23) (24) (25) (26) (27)	ource erige SC V easte their bsori uses dequal odder mondon Radic Route Shiel Proham and Inverse Proham mer Radic Control Calibration Survey Other	e containerator i frials containerator i fria	ers ers ent er (of in cali ers onr waste dionu of gi of la requi f eati g spose dis cu ained on mo age n vels < on (sr urrenlers op ers av CIFY	on radionu w ibration hel extem managem clide ston oves b coats ired ng, drinki al records urrent outh pipet neets req 2.5 mR/hr meam) t cerational railable IN REMAN	al nent age
NUCLIDE 3 METER 1 METER 2 METER NUCLIDE 3		Ki										MET	ER 1	1	METER	2	METER	3

				The second secon	-				1C					AL	
RADIAT	ION	SAF	ETY	SUR	VEY	1					Brog	RF		om no C	svr.
AUTHORIZ INVESTIGAT		MAM	(E (last, f	irst initie	el)				PH	ONE	NO,	DATE		n, day, year	r)
SURVEYO	R		ATTS.		al)				PH	ONE	NO.	SURVE		TER USE	0
apparation requires strates about security	FUG	E	SHELF	OLINOIS DE LA CONTRACTOR DE LA CONTRACTO	SHE	LF]	5	A COLO CALCADORNA		COM	IPLIANC	E ITEMS		COMPLIA	
WEST I					4			EA LCO		YH	(2) Sou (3) Ref (4) LSC (5) Waz (6) Oth (7) Abs us (8) Add (9) Hoo	ste conta ier equipi	ainers freeze iners ment aper (ood flo w in ca	on radion (w libration	ucli d e
SMEAR RE				(fill in	the n	ucli d e	(e)e	own th	ne		(11) Re (12) A (13) R (14) R (15) S (16) Pr (17) In (18) S (19) P (20) P (21) C	monitorina dioactive dequate i outine us outine us hielding, rohibition and smok ventory? urvey recersonnel rohibition orridor st nents	g waste radionure of give of la if requiring dispositioned or trained or age in the corage in the co	manager uclide stor loves b coals ired ing, drink al records urrent i outh pipe meets rec	ment age ting, tting
side of the to		l smears	100 cm ²)						1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	(11) Re (12) Al (13) R (14) R (15) Si (16) Pr (17) In (18) S (19) P (20) Pr (21) C	monitorin adioactive dequate i outine us outine us hielding, rohibition and smok ventory/ urvey rec ersonnel rohibition orridor st nents adiation I ontaminal	g waste radionure of give of la if requiring disposaronds c trained or age if evels attorn (so	manager uclide stor loves b coats vired ing, drink al records urrent f buth pipe meets rec (2.5 mR/h mears)	ment age ting,
		l smears			the n	ucli de	(e) d	own th	ne 10	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	(11) Re (12) Al (13) R (14) R (15) S (16) Pl (18) S (19) P (20) Pl (21) C (22) R (23) C (24) C (25) S (26) S	monitorina dioactive dequate is outine us outine us hielding, rohibition and smok ventory? urvey recersonnel rohibition ornidor stinents adiation I ontaminal 100 dpm alibration urvey me urvey me urvey me	g waste radionure of give of la if required of eating disposition or age in evels of trained or age in current evers of the current even as the current even even even even even even even e	manager uclide stor loves b coats vired ing, drink al records ument t outh pipe meets rec (2.5 mR/h mears) t perational	ment trage titing, titing quire

RADIAT	ION	SAF	ETY	SURVE	Υ				BLDQ.	RPF	ROC	St Cor	
AUTHORIZE INVESTIGAT	ED	-	E (last, fir					PHON	E NO.		E (month	$\frac{S+COT}{1, day, year}$	
SURVEYOR		1	E (last, fir	273				PHON	IE NO.	SURV		ER USED	
		parative cases are their	ha phi sherren Achile e nah	MUSEUM TROP SERVICES	No	orth		CC	MPLIANO	CE ITEM		COMPLIAN VIOLATION	7 7
				4	No	TT,		Y	N				
								1		gns & lat		im.	
							Z	1	(3) Re	efrigerato C vials		r	
								1	(5) W (6) Ot	aste cont her equi	pment		
								3	(7) At		paper (on radion uc	lide
							Foy	23 3	(8) A	dequate ood air fl	hood ite		
								42	(10) A	Adequate monitor	person ing	nel etiems	
												managem uclide stora	
						4	MATER	1, 2	(14) F	Routine (use of la	b coats	
								5	(15)	Shi el din g Prohibitio	, if requ in of eat		19,
						- 1				and am		al records	
					-	outh				nventory			
					-	euth Lovr,			(18)	Survey ri Personn	ecords c el traine d	ument i	
Salara Salar		economic de la company			C. C	LOVY,			(18)	Survey ri Personni Prohibitio Comidor	ecords c el traine d on on mo	urrent	
SMEAR RE			100	(fill in the	C. C	LOVY,	own th	e	(18) (19) (20) (21)	Survey re Personne Prohibition Comidor ments Radiation	ecords c el traine d on on mo storage r n levels «	urrent 1 outh pipetti meets requ < 2.5 mR/hr	
side of the te		smears	100		C. C	LOVY,	own th	e 10	(18) (19) (20) (21) (22) (23)	Survey ri Personni Prohibitio Comidor ments Radiation Contamir < 100 dg	ecords c el trainect on on mo storage r n levels « nation (s pm	urrent d outh pipetti meets requ (2.5 mR/hr mears)	
	able. All	smears	100 cm ²	5 6	nuclide	e(a) do			(18) (19) (20) (21) (22) (23) (24) (25)	Survey ri Personni Prohibitic Comdor ments Radiation Contamir < 100 dp Calibratio Survey n	ecords cel trained on on mostorage relevels contained (see a contained to company of the contained to contained the contained th	urrent i outh pipetti meets requ (2.5 mR/hr mears) it perational	
side of the te		smears	100 cm ²)	nuclide	e(a) do			(18) (19) (20) (21) (23) (24) (25) (26)	Survey ri Personne Prohibition Comidor ments Radiation Contamir < 100 di Calibration Survey n	ecords cell trained on on mostorage relation (sport current neters of neters as an enters as as an e	urrent i outh pipetti meets requ (2.5 mR/hr mears) it perational	ire

ECOLOGY SERVICES, INC. 300 Second St., Laurel, Maryland 30 (301) 498-1514	no-	Company Name:	FDA	
RADIA 7	ION SAFETY S	URVEY	Building / Room:	/LAB 18
Authorized Investigator:	NAME:		Phone No.	Date: 8-18-97
Surveyor:	NAME: WATTS, C		Phone No.	Survey Meter Used U3-144-9
FUGE L	FZR RFG	DESK d/	Complie	N - Non-Compliance Blank - Not Evaluated ance Items:
10 /	1 2 / 9	2 DE 52	Radioactive	tainers r / Freezer tainers pment Paper Hood Flow Personnel Monitoring waste Management adionuclide Storage e of Gloves
	H0/08	FUGE	☐ ☐ Adequate u	
H	ipe Sample Results.		etc.	k Disposal Records
Nuclide 3 Nuclide 4 Note: All wipe sample results a	3 4 5 6		Survey Recompleted Personnel 1 Prohibition Radiation L Contaminat < 100 DP Survey Instrument:	ords Current Trained on Mouth Pipetting evels ion (Wipes) M/100 sq. cm.
			00/	Operational Available Other (Specify in Comments)
			E.	51 Form HP5 1 Rev 1.0 1;+2

RADIATION	SAFETY SU	IRVEY		BLDGP	RE	ROOM NO.
AUTHORIZED INVESTIGATOR	NAME (last, first in	nitial)	PHO	NE NO.		month, day, year) 8-(8-92
SURVEYOR	NAME (last, first in	nitial)	PHO	NE NO.	SURVEY L3	METER USED
				OMPLIANCE	EITEMS	Y=COMPLIANCE N=VIOLATION
			Y Y	N		
DESK			DESK	(2) Sou (3) Refr (4) LSC	ns & lable irce conta igerator/f : vials ite contain	in ers fre ez er
				(6) Oth (7) Abs us (8) Ade	er equipm orbant pa seareas) equate ho	nent aper (on radionuciide
1				(10) Ac	dequate p monitoring adioactive	ersonnel external
				(14) R (15) SI (16) Pr	outine us hielding, l	e of gloves e of lab coats if required of eating, drinking
	SINK		30			
H000 MQ	3 2 2 XID,	CAB.	LSC	(17) In (18) S (19) P (20) P	ventory? o urvey reco ersonnel rohibition	disposal records ords current trained on mouth pipetting
SMEAR RESULT	S (In DPM) (IIII	in the nuclide(3)		(17) In (18) S (19) P (20) P (21) C	ventory / c urvey rece ersonnel ! rohibition omidor sto nents adiation !e	disposal records ords current trained on mouth pipetting orage meets require
HOOD NO	S (In DPM) (IIII	in the nuclide(3)		(17) In (18) S (19) P (20) Pr (21) C (22) R (23) C	ventory / c unvey rec- ers onnel l rohibition omidor sto nents adiation le ontaminat (100 dpm alibration	disposal records ords current trained on mouth pipetting orage meets require evels < 2.5 mR/hr ion (smears) current
SMEAR RESULT	S (In DPM) (fill smears 100 cm ²)	in the nuclide(3)	down the	(17) In (18) S (19) P (20) Pr (21) C (22) R (23) C (24) C (25) S (26) S	ventory / curvey recorders onnel for a to ments a diation le ontaminate (100 dpm alibration urvey me urvey me	disposal records ords current trained on mouth pipetting orage meets require evels < 2.5 mR/hr ion (smears)

COULD NOT LOCATE INVENDENT DISPOSAL OR SURVEY RECORDS

Rev. Oct 1990

ECO	LO	G'	Y	SE	RVI	CE	S,	I	VC		10	OMP/	MY	NAME:	FT	SA	
RADIAT	ION	SA	AFE1	Y	SURV	EY					8	BLDG	-	B8		OM NO. 756	
AUTHORIZ INVESTIGAT		N.	AME (last, fir	st initial)				PH	ION	IE N	10.		DATE (1	month S-	day, year)
SURYEYO	R	N	AME (last, fir	st initial)				Ph	101	IE N	10.		SURVEY 6	MET	TER USEC)
	724	W.	C	1574	THE PERSON CONTROL		5	14	()	Ç	OMP	LIANC	E	ITEMS		COMPLIAN VIOLATION	
	6	7						<u>C</u>) (_	Y	H						
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						. 6						(4) LS	CI	jeralor i fi vials e contain			
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ide of the ta	able, Al	smei 2	ars 10	0 cm*	5 6	7	8	9	10			(23)	Cor	ntaminati 00 dpm	on (s	mears)	
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The second secon							-				BLD	0			DA OM, NO.	
RADIATIO	N	SAFE	TY	SUF	RVE	Υ					DLD	BS	RF.		with (lory.
AUTHORIZED INVESTIGATOR	3	NAME	(last, f	inst init	tial)		-		Ph	ION	E NO.		DATE (and the same of th	n, day, ye	ar)
SURVEYOR			(last, 1		tial)				PH	ION	E NO.		SURVE		FER USE	D
	100000			SCHOOL SECTION		ACTION OF A PARTY.	E-E-CHICAL CONTROL			CO	MPLIA	NCE	ITEMS		COMPLIA VIOLATIO	
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										7	(4)	LSC				
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											(7)		orbant pa e areas)	per (on radion	uclide
										A	(8)		quate ho	od flo	W	
										1			d air flow equale p			mal
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	1							1	e, ·	1			dioactive equate m			
	/					-	16	EAST	T corr.		[13) Ro	utine use	e of gl	oves	
01-2	WEST (51:	2	3			(1)		5	H			utine use elding, i			
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											7 (20) Pro	hibition	on mo	outh pipe	
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side of the table				4.00	i the i	ruciių	c(a) u	OWITT	110			2) Ra	diation le			nr
		1	T	-	1	T -			10		(23		ntaminati 100 dpm	on (s	mears)	
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TE					4	1			1	50	11//		ner i ber	Tr V	TOU INCOME.	
IUCLIDE 2										1	ETER	1	METER	MANAGE ENGINEERING	METER	LISTER DE PRODUCTION

NADIA	TION	SA	FET	Y	SUR	VEY				BLDG	BI	下		OM NO.	
AUTHORIZ IN VESTIGA		NA	ME (last, fi	rst initie	J)			PHOI	NE NO.	-	DATE (, day, yea	and in commendated with
SURVEYO		NA	ME (last, fi	rst initie	d)			PHO	NE NO.		the state of the s	MET	ER USE)
		***************************************	and street dealers		New March 1880			yent con a system	C	OMPLIAN	ICE	HANNA A THE RESIDENCE	Y = (COMPLIAN	
				5	4	2.		STELF		(2) S (3) R (4) L (5) Y (6) C (7) A (8) A (9) H (10) (12) (13) (14) (15)	ourcefriggs SC Vaste (therrbsoruse deqqood Ade Radi Shie Prof	contain equipm bant pap areas) uate hoc air flow quate pe initoring oactive v quate ra- time use Iding, if ibition o	eezer ers ent er (o in cali ersonr vaste dionu of gl requi f eatif	on radion u w ibration nel extern managen clide ston oves c coats	al nent
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MEAR R		smea.	rs 10	1) 0 cm ²	(till in t			own th	e	(17) (18) (19) (20) (21) (21) (22) (23) (24) (25) (26)	Inve Sun Pers Prof Corr mei Con < 1 Calit Sun Sun	ntory / dis vey recor- connel to nibition of idor stonents ation lever tamination 00 dpm pration covey meter vey meter	ds cuained on mo age mels con (sment rs opers ave	uth pipetineets req 2.5 mR/hr nears)	ing uire-

RADIATI	NO	SA	FET	Υ	SUF	RVE	Υ					BLDG	R	8		OM NO.	
AUTHORIZE INVESTIGATO		N.A	ME (last, fi	rat init	ial)				PH	ONE	NO.	D		onth	, day, year)
SURVEYOR		N/	ME (last, fil	rst init	ial)				PH	ONE	NO.	S	URVEY		ER USED	
		5C	SINE DAY BOOK		er jaguardurek o	STATE OF THE PARTY	E Brand Charles	7-1300	7-12-0	/	CON	IPLIANC	EIT	EM\$	2	COMPLIAN VIOLATION	
			7		1			12.17			Y B						
LSC										BATH	1	(2) Soil (3) Ref (4) LS	urce rige C vis		ers eeze		
/							10				1	(6) Oth (7) Ab:	ner e sorb se a	reas)	ent er (d	on radion u	clide
								9				(9) Ho (10) A	od a deq mor	uate pe litoring	n cal rsonr	ibration nel extern	
BATH	15401	NP			1		- 3	net want				(12) A (13) R (14) R (15) S	deq outin outin hi ele	uate rac ne use ne use ding, if	of gl of la requ	b coals ired	age.
7	100			51	NK] 8	1	+3 40 1991		FZR	1	(17) In	and	smokin tory / dis	g 3 p o 3 8	ng, drinki al records	ng,
MOOD	9				7			2-08	50.1	RFR	4	(19) P	erac	nnel tra bition o	ain e d		ing
SMEAR RE						ther	nuclid	e(3) d	own	the	才 4	(21) C	omi o men ladia	for ston	els «	neets requests 2.5 mR/hr	uire-
OCATION	1	2	3	4	5	6	7	8	9	10		(24) C	< 10 alibr	0 dpm ration co	urren	t	
IUCLIDE 16	_job									->	4	[26] S	urvi	ey mete	rs av	perational railable IN REMAF	RKS
NUCLIDE 2											ME	TER 1	economics	/ETER	EVEN TRESSEE	METER	3
NUCLIDE 3						1											

FLOUR CONSTANTINATED; 5577 dpm/20 cm² CUTLET CONTANTINATED; 11,346 dpm/20 cm² RAO TATE CONTANTINATED; 4423 dpm/20 cm²

Rev. Oct 1990

ECOLO	GY	7	SE	RI	VIC	Œ	S,	II	V(].		COMPAN	IY NAME	F	DA	
RADIATION	SA	FET	ΓY	SUI	RVE	Υ						BLDG.	B8		OM NO.	
AUTHORIZED INVESTIGATOR	NA	ME (last, f	rat inil	tial)				F	РНО	NE	NO.	DATE	mont!	h, day, yes	ar)
SURVEYOR	NA	ME (last, f	nst ini	tial)				1	РНО	NE	NO.	SURVE	Y ME	TER USE	D
		AND DESCRIPTION	ADES SIEGRAFIAN ES	DESCRIPTION OF STREET	MANAGE MANAGE	Balance Color	INC	U	HO	C	OM	PLIANCE	ITEMS		COMPLIA	
		-				1	ne minerar		000	Y	H					
DESK								-		+			s & lable		om	
										E		(3) Refri (4) LSC	gerator// vials	reeze	r	
										F		(6) Othe	te contair er equipm	ent	on radion (iclide
										h		us	e areas) quale ho			201100
										F	F	(9) Hoo	d air flow	in ca		nal
												(11) Ra		waste	manager	
												(13) Ro	utine use	of gl		age
		2	INV	/						-	+	(15) Sh	utine use ielding, i shibition	requ		ina
		o di ministratori de m		and the latest the second second					H			(17) Inv	nd smoki entory/d	ng isposi	al records	
					RFR	L			000	-	+	(19) Pe	rvey reco	rain e d		tina
SMEAR RESULTS	S (in	DPN	1	(fill in	PARESTON	SCHOOLSE	e(3) d	aven t	n . Yeren		MCSND	(21) Co			meets red	
side of the table. All					t tite i	140110	c(3) u	0 41) (2202000	(22) Ra			2.5 mR/h mears)	r
LOCATION 1	2	3	4	5	6	7	8	9	1	0		(24) Ca	100 dpm libration o	urren		
NUCLIDE 1											+	[26] Su	rvey met	ers av	relable	DVC
NUCLIDE 2										-	MET	ER 1	METER	PERSONAL	IN REMA	AND DESCRIPTION OF THE PERSON
NUCLIDE 3										1						

No RAM USE

RADIATION	SA	FETY	SU	RVI	ΕY		Maria Provincia de Sancia de Caracia de Cara			BLDG	OMPANY NAME FDA BLDG FB8 ROOM 1 64			,
AUTHORIZED INVESTIGATOR	NA	ME (last,	first in	itial)	Mich officeration			F	HO	IE NO.	DATE (month, c	the measure have not assume	A Section of the last
SURVEYOR	NA	ME (last,	first in	itial)				F	HON	NE NO.	SURVE	Y METER	R USEC)
	Microsope of C. Discharge of			and in visit of the	OK DAGUNU KISU BA		TOP COLUMN STATE OF THE STATE O	ROMEN STRONG	C	OMPLIANC	EITEMS		MPLIAN	
FUBE			r. B	5		}	-21	<	Y	H				
										(2) 500	ns & lable: irce contai	ners		
DESK		4					Marie Propaga di Arr		F	(4) LSC	nigerator/f Mals ste contain			
							4	Ċ		(6) Oth (7) Abs	er equipm orbant pa	ent	radionu	clid
										(8) Ade	e areas)			
								1-10-7		(10) Ac	d air flow lequate pe nonitoring			al
		3							E	(11) Ra (12) Ad	dioactive videquate ra	dionuclia	ie stora	
SINK							1 2	sC.	L	(14) Ro	outine use outine use nielding, if	of lab c	oals	
				3				>(_		(16) Pr	ohibition o nd smokin	f eating		ıg,
Fuge				K			LE	0	E	(18) Su	ventory / di	ds curre		
	NATION AND PROPERTY.	THE SHARE SHARE			MARINE MARIN	NATURE STREET	WANTED THE STATE OF THE STATE O		F	(20) Pr	raonnel tr chibition o midor ator	n mouth		
SMEAR RESULT aide of the table. A				the	nuclid	e(s) d	own ti	he		(22) Ra	ents diation lev	els < 2.5	mR/hr	
OCATION 1		3 4	5	6	7	8	9	10		<	ntaminatio 100 dpm libration ci		na)	
UCLIDE P ZIO			7						F	(25) Su (26) Su	rvey mete	rs opera	ble	VE
UCLIDE 2									М	ETER 1	METER	**************************************	ETER	3
UCLIDE 3			1			-			1					

REMARKS: (Refer to item No. Include violations corrected by supervisor.)

RADIATION	SAFE	TY	SU	RVE	EY					BLDG	00M NO.	2		
AUTHORIZED INVESTIGATOR	NAME	(last, f	inst in	itial)				P	HONE	NO. DATE (month, day, year				
SURVEYOR	NAME	(last, f		itial)				P	HONE	NO. SURVEY METER USE				
/				62,44499.903.000	niorina ricolaria (n. 1914)	COMPANY CONTROL		CONTOCONSCIONS	co	MPLIANC	E ITEMS		COMPLIA VIOLATIO	
C				No	N	RI	4M		Y					
B 2 2									1	(2) So	ns & lable urce conta	iners		
	1		,	57	OR	(A (3E			(4) LS	irigerator i i C vials ste contair		er	
4	1								4	(6) Oth	ner equipm sorbant pa	ent	on radion (ıclide
						my				(8) Ad	seareas) equale ho			
ZWK C	WA									(10) A	od air flow dequate p	ers or		al
FLAMM!						and the same of th			4	(11) R	monitoring adioactive dequate re	steem !		
CAB.		******		-	-	-	eros .			(13) R	outine use	of g	loves	- 8
		8				AW				(15) S (16) Pi	hielding , if rohibition (requ of eat	uire d	ng,
10		4	7	40	rA(3E		FC	4	(17) In	and smokir ventory/di urvey reco	eoge		
Almara	-	1						AAB		(19) P	ers onn el tr rohibition	rain e d	1	ina
SMEAR RESULTS	(in DPN	1)	(fill in	the	nuclid	e(3) d	own t	lm he		(21) C	omidor stor nents	age	meets req	uire-
of do not be a kindle of the	mears 10	0 cm ²)					,	4	(23) C	adiation les ontamination			
side of the table. All :			5	6	7	8	9	10	1		100 dpm			
LOCATION 1	2 3	4	0						-	mind .	alibration c			
	2 3	4	5					>		(25) S (26) S	alibration c urvey mete urvey mete ther (SPE	ers of	erational railable	SK S I

REMARKS: (Refer to item No. Include violations corrected by supervisor.)

ECOL	OG	Y	ناء	K1	/11	L	S,	11	VC.		LOMP	AN	YNAME	FI	A	
RADIATIO	N S	AFET	Υ	SUF	RVE	Υ					BLDG	<u> -</u>	38	and the same of	0M NO.	
AUTHORIZED INVESTIGATOR		AME (last, fi	rst init	ial)				PH	ONE	NO.	O. DATE (month, day, year))
SURVEYOR	N	AME (last, fi		(lai				ONE	NO. SURVEY METER USED						
ACTUAL DE LA CONTRACTOR DE		H	ESASTICATE A CHEL	Na estados a constitu	* THE COLUMN	學成功法等學等	MESSAGE STREET	estamaemosas		СОМ	PLIAN	ICE	ITEMS		OMPLIAN	
SMEAR RES	ULTS (in		7		C	3	e(3) d	FZ	Fuge R	Y N	(2) S (3) F (4) L (5) Y (6) C (7) A (8) A (9) F (10) (11) (12) (13) (14) (15) (16) (17) (18) (19) (20) (21)	Vaste SC Vaste Adeo Adeo Adeo Adeo Adeo Adeo Adeo Ade	eareas) quate ho d air flow equate p onit oring floactive equate re utine use elding, if hibition ind smokin entory/ d vey reco re onnel t hibition ind or sto ents diation le	ners reezel ners ners ners ners ners ners ners nod floo in cal erson waste dionu e of gl erson frequ of eati ng ispose orage rage rage rage vels «	managem clide store oves b coals ired ng, drinki al records urrent outh pipeli neets req	al nent age
	1 2	3	4	5	6	7	8	9	10			<	ntaminati 100 dpm			
	۵ –								÷		(25)	Sur	rvey met	ers of	enational	RKS)
NUCLIDE 2										MET	TER	1	METER	2	METER	3
NUCLIDE 3																

REMARKS: (Refer to item No. . Include violations corrected by supervisor.)

COLOGY SERVICES, INC. 440 Second St., Laurel, Maryland 2076 (301) 498-1514	Company Nam	T.	-DA	
	ON SAFETY SURVEY	Buil	ding / Room:	2305
Authorized Investigator:	NAME:	Pho	ne No.	Date: 8-18-92
Surveyor:	NAME: WATE, C	Pho	ne No.	Survey Meter Use
DE	SK FLAMM H	Y	were a	Y - Compliance V - Non-Compliance lank - Not Evaluate
	BENZCH 2		Signs & Lab Source Cont Refrigerator L.S. Vials Waste Cont Other Equip Absorbent F Adequate H Adequate P Radioactive Adequate ra Routine use Adequate use	ainers / Freezer ainers ment Paper ood Flow ersonnel Monitoring Waste Managemen adionuclide Storage of Gloves of Lab Coats
LOCATION: 1 2	/ipe Sample Results: 3 4 5 6 7 8	9 10	etc. Inventory & Survey Rec	
7114 2000 7				on Mouth Pipetting
Nuclide 2			Radiation L	
Nuclide 3			Contaminat	
Nuclide 4	1 - 1 - CDD1 (100	Sı	< 100 DP irvey Instrument:	M/100 sq. cm.
Comments:	are in units of DPM / 100 sq. cm.			Calibration Current Operational Available Other (Specify in Comments)

ECOLOGY SERVICES, INC. 300 Second St. Laurel, Maryland 2070 (3ct) 498-1314	77	Compan	y Name:		FDA	
RADIATI	ON SAFETY	SURVEY			Building / Room: N(01) \	2418
Authorized Investigator:	NAME:				Phone No.	Date: 8-18-97
Surveyor:	NAME:	1			Plane No.	Survey Meter Use 13 W 44-9
RFG		DESK				Y - Compliance N - Non-Compliance Slank - Not Evaluate
BELL 3	BENCH	H-JW	4	FILE	Signs & Lat Source Con Source Con Refrigerator L.S. Vials Substance Cont Absorbent Absorbent Adequate F Radioactive Routine use Routine use Adequate use	tainers / Freezer ainers pment Paper food Flow ersonnel Monitoring Waste Managemen adionuclide Storage of Gloves of Lab Coats
	ipe Sample Resu					& Disposal Records
Nuclide 1 P 2	3 4 5	6 7	8	9 10	Survey Red	
Nuclide 2					Q Q Radiation I	
Nuclide 3					O O Contamina	
Nuclide 4					< 100 DF Survey Instrument	M/100 sq. cm.
Note: All wipe sample results	are in units of DPM	/ 100 sq. cm.			The same and	Calibration Current
Comments:					00	Operational Available Other (Specify in Comments)
						ESI Form HPS I Rev 1:0 1/

RX) Second St., Laurel, Maryland 2076 (RH) 498-1514	17	Compan	y Name:	FDA
	ON SAFETY SO	URVEY		Building / Room: MOD 1 107
Authorized Investigator:	NAME:			Phone No. Date: \$-19-92
Surveyor:	NAME:			Phone No. Savey Meter User
	SHELVES			Compliance Items: Y - Compliance Y N N - Non-Compliance Blank - Not Evaluated
				Compliance Items: Signs & Labels: Room Source Containers L.S. Vials U.S. Via
н	Vipe Sample Result	S.*		etc. Inventory & Disposal Records

COLOGY SERVICES, IN ON Second St., Laurel, Mary 901) 498-1514			Compa	ny Nam	d:		FDA	
RAL	DIATION S	AFETY S	URVEY				ing / Room: MOD 1	16414
Authorized Investig	ator: NAN	(E:				Phone	No.	Date: 5-15-92
Surveyor:	NA.	AFRS, C				Phone	e No.	Survey Meter Use
H 0	LA	SER		1		Comp	4 1	Y - Compliance N - Non-Compliance Blank - Not Evaluated
D B M Z O #		B E N C H	- RFO	FR	FG		Signs & Lat Source Con Refrigerator L.S. Vials Waste Cont Other Equip Absorbent I Adequate H Adequate P Radioactive Adequate r Routine use Routine use Adequate use	tainers r / Freezer ainers pment Paper food Flow ersonnel Monitoring waste Management adionuclide Storage
LOCATION; 1 Nuclide 1 Nuclide 3	Wipe Sa	umple Resul	lts: 6 7	8	9	10	Survey Red Personnel	Trained on Mouth Pipetting
Nuclide 3 Nuclide 4							Contamina	
Note: All wipe sample Comments:	RAGA		100 sq. cm			Sur	vey Instrument	

70000	y				_	-Y000001		
ECOLOGY SERVICES, INC. 300 Second St., Laurel, Maryland 2070 (2011) 498-1514	17	(Compar	ny Nan	ie:		FDA	
RADIATI	ON SAFET	TY SUR	VEY				Building / Room:	1/6402
Authorized Investigator:	NAME:						Phone No.	Date: 5.18-97
Surveyor:	NAME:	C					Phone No.	Survey Meter Used
					and the second	T	Compliance Item	is: Y - Compliance
SINA	ICE						Y N	N - Non-Compliance Blank - Not Evaluated
CENT.							Comp	
RF6					BE		L.S. Vial	ontainers
					NC		Other Ed	nt Paper
FZR					H		Radioace Adequat	tive Waste Management te radionuclide Storage use of Gloves use of Lab Coats
		n /					☐ ☐ Adequat	te use of Shielding ion of eating, drinking,
	ipe Sample I			0		10	and ton	ry & Disposal Records
LOCATION: 1 2	3 4	5 6	7	8	9	10	Survey Dersonn	Records Current
Nuclide 2			- 1					ion on Mouth Pipetting
Nuclide 3							Q Q Radiatio	
Nuclide 4								ination (Wipes) DPM/100 sq. cm.
Note: All wipe sample results	are in units of I	DPM / 100	sq. cm				Survey Instrum	ent:
Comments:							-	Calibration Current Operational
								Available
No R	FW. Usa						00	Other (Specify in Comments)
								ES1 Form HPS.1 Rev 1.0 1/92

ECOLOGY SERVICES, INC. Company Name: 300 Second St., Laurel, Maryland 20707 (301) 498-1514	FDA	
RADIATION SAFETY SURVEY	Building / Room:	13404
Authorized Investigator: NAME:	Phone No.	Dute: 8-19-92
Surveyor: NAME: UXTS C	Phone No.	Survey Meter Used Bullu-9
PFG HOO	00 E	N - Non-Compliance Blank - Not Evaluated
BENGH N N C H DESK BENGH WI HOUSING BENGH WI HOUSING BENGH WI HOUSING	Signs & Lat Source Con Refrigerator L.S. Vials Substance Cont Absorbent Absorbent Adequate P Radioactive Routine use Routine use Adequate use	tainers // Freezer ainers ment Paper lood Flow ersonnel Monitoring Waste Management adionuclide Storage of Gloves of Lab Coats
Wipe Sample Results:	etc.	& Disposal Records
LOCATION: 1 2 3 4 5 6 7 8 9 10	Radiation I Contamina < 100 DP Survey Instrument	Trained on Mouth Pipetting Levels tion (Wipes) M/100 sq. cm.
	00	Available Other (Specify in Comments) (St Form HPS 1 Rev 1.0 1/9

Company Name: ECOLOGY SERVICES, INC. FDA 300 Second St., Laurel, Maryland 2070. (301) 448-1514 Building / Room: RADIATION SAFETY SURVEY NOD 2313 Date: Phone No. NAME: Authorized Investigator: Survey Meter Used NAME: Phone No. Surveyor: Compliance Items: Y - Compliance YN N - Non-Compliance 4 00 Blank - Not Evaluated 0 0 Compliance Items: Signs & Labels: Room 0 Source Containers ☐ ☐ Refrigerator / Freezer Q Q L.S. Vials ☐ ☐ Waste Containers 5 Other Equipment LSC Absorbent Paper Adequate Hood Flow Adequate Personnel Monitoring FILTER Radioactive Waste Management HOUSING ☐ ☐ Adequate radionuclide Storage Routine use of Gloves Routine use of Lab Coats Adequate use of Shielding Prohibition of eating, drinking, Wipe Sample Results: ☐ ☐ Inventory & Disposal Records LOCATION: Survey Records Current 4100 Nuclide 1 Personnel Trained Prohibition on Mouth Pipetting Nuclide 2 Radiation Levels Nuclide 3 Contamination (Wipes) Nuclide 4 < 100 DPM/100 sq. cm. Survey Instrument: Note: All wipe sample results are in units of DPM / 100 sq. cm. Calibration Current Comments: Operational Available Other (Specify in Comments) EST Form HPS.1 Rev 1.0 1/92

ECOLOGY SERVICES, INC. JAN Second St., Laurel, Maryland 207 (301) 498-1514	707	Company N.	ime:	FDA									
RADIAT	ION SAFETY SU	URVEY		Building / Room:	1/2315								
Authorized Investigator:	NAME:			Phone No. Date: S-13-97 Phone No. Survey Meter L Blank - Not Evalua Compliance Items: Signs & Labels: Room Source Containers Refrigerator / Freezer L.S. Vials Waste Containers Other Equipment Absorbent Paper Adequate Hood Flow Adequate Personnel Monitori Radioactive Waste Manageme Adequate radionuclide Storage Routine use of Gloves Routine use of Gloves Routine use of Shielding Prohibition of eating, drinkin etc. Inventory & Disposal Record Survey Records Current Personnel Trained									
Surveyor:	NAME: NAME: C			Phone No.	Survey Meter Used								
H600	TABL	E	3	and and	N - Non-Compliance Blank - Not Evaluated								
A C O D CO	(3)	5	S J X X	Source Con Refrigerator L.S. Vials Substitute Cont Absorbent Adequate F Adequate P Radioactive Routine use Routine use Adequate use Prohibition	tainers / Freezer ainers pment Paper Jood Flow ersonnel Monitoring Waste Management adionuclide Storage of Gloves of Lab Coats ase of Shielding								
LOCATION: 1 2 Nuclide 1 P Auclide 2 Nuclide 3 Nuclide 4 Note: All wipe sample results		5 7 8	9 10	Survey Reconnel Personnel Prohibition Radiation I Contaminal < 100 DP Survey Instrument	cords Current Trained on Mouth Pipetting Levels tion (Wipes) M/100 sq. cm.								
Comments: ENTERNICE PLOT	P05123 W	ORM 516	N		Operational Available Other (Specify in Comments)								

COLOGY SERVICES, INC. 200 Second St., Laurel, Maryland 20707 (201) 398-1514	ompany Name:	FDA	
RADIATION SAFETY SUR	VEY	Building / Room:	/ 2321
Authorized Investigator: NAME:		Phone No.	Date: 8-18-97
Surveyor: NAME: WATB, C		Phone No.	Survey Meter Used
DESK	4		Y - Compliance N - Non-Compliance llank - Not Evaluated
B E N C H DESK DESK Wipe Sample Results:	BENZICH	Signs & Lat Source Con Refrigerator L.S. Vials Waste Cont Absorbent I Adequate H Radioactive Routine use Routine use Adequate use Prohibition etc.	tainers / Freezer ainers ment Paper ood Flow ersonnel Monitoring Waste Management adionuclide Storage of Gloves of Lab Coats
LOCATION: 1 2 3 4 5 6 Nuclide 1 Nuclide 2 Nuclide 3 Nuclide 3 Note: All wipe sample results are in units of DPM / 100 second and the sample results are in units of DPM / 100 second and the sample results are in units of DPM / 100 second and the sample results are in units of DPM / 100 second and the sample results are in units of DPM / 100 second and the sample results are in units of DPM / 100 second and the sample results are in units of DPM / 100 second and the sample results are in units of DPM / 100 second and the sample results are in units of DPM / 100 second and the sample results are in units of DPM / 100 second and the sample results are in units of DPM / 100 second and the sample results are in units of DPM / 100 second and the sample results are in units of DPM / 100 second and the sample results are in units of DPM / 100 second and the sample results are in units of DPM / 100 second and the sample results are in units of DPM / 100 second and the sample results are in units of DPM / 100 second and the sample results are in units of DPM / 100 second and the sample results are in units of DPM / 100 second and the sample results are in units of DPM / 100 second and the sample results are in units of DPM / 100 second and the sample results are in units of DPM / 100 second and the sample results are in units of DPM / 100 second and the sample results are in units of DPM / 100 second and the sample results are in units of DPM / 100 second and the sample results are in units of DPM / 100 second and the sample results are in units of DPM / 100 second and the sample results are in units of DPM / 100 second and the sample results are in units of DPM / 100 second and the sample results are in units of DPM / 100 second and the sample results are in units of DPM / 100 second and the sample results are in units of DPM / 100 second and the sample results are in units of DPM / 100 second and the sample results are in units of DPM / 100 second and the sample results are in units of DPM / 100 second and the sampl	7 8 9 10	Survey Recompleted Personnel 10 Prohibition Radiation I Contaminate 100 DP Survey Instrument	ords Current Trained on Mouth Pipetting evels ion (Wipes) M/100 sq. cm.

Company Name: ECOLOGY SERVICES, INC. FDA 3(8) Second St., Laurel, Maryland 20707 (301) 498-1514 Building / Room: RADIATION SAFETY SURVEY MOD Phone No. Date: NAME: Authorized Investigator: Survey Meter Used NAME: Phone No. Surveyor: 44-6 Compliance Items: Y - Compliance YN N - Non-Compliance 00 Blank - Not Evaluated Compliance Items: ☐ ☐ Signs & Labels: Room ☐ ☐ Source Containers Refrigerator / Freezer L.S. Vials ☐ ☐ Waste Containers Other Equipment Absorbent Paper Adequate Hood Flow Adequate Personnel Monitoring Radioactive Waste Management Adequate radionuclide Storage ☐ ☐ Routine use of Gloves Routine use of Lab Coats Adequate use of Shielding Prohibition of eating, drinking, Wipe Sample Results: ☐ ☐ Inventory & Disposal Records LOCATION 10 Survey Records Current Personnel Trained Nuclide 1 Prohibition on Mouth Pipetting Nuclide 2 A Radiation Levels Nuclide 3 Contamination (Wipes) Nuclide 4 < 100 DPM/100 sq. cm. Survey Instrument: Note: All wipe sample results are in units of DPM / 100 sq. cm. Calibration Current Operational Comments: Available O Other (Specify in Comments) ESI Form HPS 1 Rev 1.0 1/92

RADIATION	SAFETY	SUR	VEY					BLDG F	B8	RC	CO34	
AUTHORIZED NYESTIGATOR	NAME [last, 1 CFSAN		,	07	icr	Ph	HONE	NO.	DATE (mont	h, day, yes	ur)
SURVEYOR	NAME (1831, 1)	The state of the s	the second second second		THE RESIDENCE OF THE PARTY OF T		HONE 498	NO. 1514	SURVEY LBZ		TER USE	
和原教	W. NOOW SIL			e	ABIN	LEF	COM	IPLIANCE	ITEMS		COMPLIA	
and I					7	******	IN	(1) Sign	s & lable:	s : ro	om	
ART 2.	9				6			(2) Sour (3) Refri	ce contai gerator I fi	ners		
70	10).			(0)				имз e contain r equipm			
19	11				5			(8) Ade (9) Hoo	e areas) quaie hoo d air flow	od flo	libration	
18 25 NK 25	17				4			(11) Rac (12) Ad	onitoring dioactive equate ra	wast e dion i	nel extern managen uclide ston	nent
100	143	7			3			(14) Ro (15) Shi (16) Pro	utine use utine use elding, if hibition o nd smokin	of la requ	b coals	ing,
15	I,	8	23	1	(00))		(17) Inv (18) Sui (19) Pei	ent ory / di vey recor sonn el tr	spos ds c aine d	1	
MEAR RESULTS	(in DE)	(fill in th	nematical de la company	(0(0) d	nonuncina ni na hi	SALDERS MA	N THE PARTY OF THE	(21) Co			outh pipett meets req	
te of the table. All s			re mucing	(a) C	own (i e		(22) Ra			2.5 mR/hr	
CATION 1 2	3 4	5 6	7	8	9	10		(24) Cal	100 dpm bration c	urren		
CLIDE 1 2100 PAM					-	>		(26) Su	vey mete vey mete ner (SPE	rs av		RKS
CLIDE 2							мет	Contract Contract Service Serv	METER	2	METER	3

Rev. Oct 1990

TWO CABINETS, CART, FREEZER, AND LSC -NOT DRESENT

FOR: FDA JOB: Bldg FB8 Room 6034 SAMPLE TYPE: Gross Alpha/Beta

DATE: 07-10-92 BY: ELW

NF	SAMPLE ID	GROSS CT	CT TIME	EFF	DPM	UCI
	#1	36	1.00	0.29	MDA	MDA
	#2	25	1.00	0.27	MDA	C MDA
	#3		1,00	0.28	MDA	C MDA
4	8.4	27	1,00	0.29	* MDA	MDA
5	#5	26	1.00	0.28	< MDA	< MDA
6	#6	32	1.00	0.27	MDA -	C MDA
7	#7	36	1.00	0.28	< MDA	< MDA
	#8	30	1.00	0.28	< MDA	< MDA
9	119	29	1.00	0.27	< MDA	€ MDA
10	#10		1.00	0.29	< MDA	MDA
	611	51	1.00	0.29	C MDA	K MDA
12	912	40	1.00	0.29	K MDA	- MDA
13	#13		1.00	0.29	MDA	< MDA
14	#14	11 - 22 1	-1.00	0.29	K MDA	K MDA
15	#15	28	1.00	0.28	MDA TO	< MDA
16	#16		1.00	0.29	K MDA	< MDA
17	#17	27	1.00	0.27	K MDA	< MDA
18	#18	40	1.00	0.28	MDA	< MDA
19	#19		1.00	0.29	< MDA	< MDA
20	#20	27	1.00	0.28	₹ MDA	4 MDA

ALCOHOLD SET AND		45 · ·	Land Services	44 - 4			Ph. 15-19-75			11 (000)
4	Brickley Co.	HER PLANS	m a r				111-11-11		PK 2	
	Property of the	Mr. Soc. Sep. Tr.			Acces de	William Control	April See 1 day	a few of the con-	1.0	

BACKGROUND DATA: 45.00 (+- 29.2%) CPM

EFFICIENCY DATA:

MEAN EFFICIENCY: 0.28+-(5.0%)

MDA DATA: 31 CTS FOR 1 MIN 116 DPM 5.21E-05 UCI

PRECISION OF MEASUREMENTS: 95% CONFIDENCE LEVEL

POR: FDA JOB: Blog FB8 Room 6034 SAMPLE TYPE: Gross Alpha/Peta

DATE: 07-10-92 BY: ELW

NR	SAMPLE ID		CT TIME	EFF	DPM	100
1	#21	41	1.00	0.27	< MDA	< MDA
2	#22	36	1.00	0.27	< MDA	< MDA
3	#23	36	1.00	0.26	< MDA	< MDA
4	#24	35	1.00	0.27	< MDA	< MDA
5	#25	29	1.00	0.28	< MDA	< MDA

COUNTER: Beckman Model LS 100C DETECTOR: LSC

EACKGROUND DATA: 45.00 (+- 29.2%) CFM

EFFICIENCY DATA:

MEAN EFFICIENCY: 0.27+-(5.0%)

MDA DATA: 31 CTS FOR 1 MIN 119 DPM 5.34E-05 UCI

PRECISION OF MEASUREMENTS: 95% CONFIDENCE LEVEL

	RADL	ATION.	SAFE	TY SU	JR I	VEY				Building / Room: F8-8 / 1810		
Authorized Investigator: NAME: Surveyor: NAME: KECK, G									Phone No.		Date: 7-9-92	
									Phone No. 498-151	4	Survey Meter Use 112 W/43-68	
4							[Y N	N Bu aplian	- Compliance - Non-Compliance ank - Not Evaluated
BENCH 3	6	BE 5	ENCH	8		10		9 BEN	СН	Source Refrig L.S. V Waste Other	e Conta erator / ials Contai Equipr	iners Freezer iners nent
H00'> 1	2		SINK					85	NCH	☐ ☐ Radio	nate Honate Peractive 'nate rac	ood Flow rsonnel Monitoring Waste Management dionuclide Storage of Gloves
							/			1		e of Shielding of eating, drinking,
		Wipe !	ample	Result	5.					O O Inven	tory &	Disposal Records
Nuclide 1 Nuclide 2 Nuclide 3	PIL 2100 DPM	2 3	4	5	6	7	8	9	10	Perso Prohi Radia Conta	nnel Ti bition (ation La aminati	on Mouth Pipetting evels on (Wipes)
Note: All wi	pe sample re	esults are in	units of	DPM /	100 s	sq. cm.				Survey Instru	iment:	M/100 sq. cm.
Comments:	REGUL N UN	AR S	PIE	EY	Re	PERI	FOR	CNE	ED or a cl	(essart)		Calibration Current Operational Available Other (Specify in Comments)

RADIATI	ON SAFETY SURVEY		Building / Room: FB-8 / 1856		
Authorized Investigator:	NAME:		Phone No.	Date: 7-9-92	
Surveyor:	Phone No. 498-1514	Survey Meter Used U.2 W/43-68			
LOCATION: 1 2 Nuclide 1 Nuclide 2 Nuclide 3 Nuclide 4 Note: All wipe sample results Comments: REGULAR	ACH H Sipe Sample Results: 3 4 5 6 are in units of DPM / 100 sq. cm. Sorvey Perform. Sorvey Perform. Copied Room.	BENCH 7 HOOD 10 8 9 10 Not a closed.	Complete Complete Signs & L. Signs & L. Source Complete C	N - Non-Compliance Blank - Not Evaluated fance Items: abels: Room intainers or / Freezer Intainers inpment to Paper Hood Flow Personnel Monitoring we Waste Management radionuclide Storage use of Gloves use of Lab Coats use of Shielding on of eating, drinking, or & Disposal Records secords Current I Trained on on Mouth Pipetting In Levels Intained On on Mouth Pipetting	

RADIATION	SAFETY SURVE	TY	Building / Room: FB-8 / 1838		
Authorized Investigator:		Phone No.	Date: 7-9-92		
Surveyor:	KECK, G		Phone No. 498-1514	Survey Meter Usex	
		DESK 5	Compliance Items	S: Y - Compliance N - Non-Compliance Blank - Not Evaluated	
BENCH 3	7	G BENCH 9 DESK	Signs & L Source Co Refrigerat L.S. Vials Source Co C	ontainers tor / Freezer ontainers ontainers uipment it Paper Hood Flow Personnel Monitoring ive Waste Management radionuclide Storage use of Gloves use of Lab Coats e use of Shielding	
Nuclide 3 Nuclide 4 Note: All wipe sample results are i	Sample Results: 4 5 6 7		etc. Inventory Survey R Personne Prohibiti Radiation Contamin < 100 I Survey Instrume	el Trained on on Mouth Pipetting n Levels nation (Wipes) DPM/100 sq. cm.	
Comments: REGULAR SI ON UNOCCU	PERFOR	RMED 1. (Not a close	ease)	Operational Available Other (Specify in Comments)	

OLOGY SERVICES, INC. O Second St., Laurel, Maryland 20707 F Z OI) 498-1514	
RADIATION SAFETY SURVEY	Building / Room: FB-8 / 1867
Authorized Investigator: NAME:	Phone No. Date: 7-9-9-2
Surveyor: NAME: KECK, G	Phone No. Survey Meter Used 498-1514 42 4/43-68
TABLE 6	Compliance Items: Y - Compliance Y N N - Non-Compliance Blank - Not Evaluated
BENCH 3 8 8 9 SIN	Waste Containers Other Equipment Absorbent Paper Adequate Hood Flow Adequate Personnel Monitoring Radioactive Waste Management Adequate radionuclide Storage Routine use of Gloves
Wipe Sample Results: LOCATION: 1 2 3 4 5 6 7 8 9 Nuclide 1 PART	etc. Inventory & Disposal Records Survey Records Current Personnel Trained Prohibition on Mouth Pipetting Radiation Levels Contamination (Wipes) < 100 DPM/100 sq. cn. Survey Instrument: Calibration Current Operational

ECOLOGY SERVICES, INC. 300 Second St., Laurel, Maryland 2070 (301) 498-1314	7	Company	Name: FDA				
RADIATI	ON SAFETY SU	URVEY		Building / Room: FB-8/1866			
Authorized Investigator:	NAME:			Phone No.	Date: 7-9-9Z		
Surveyor:	Surveyor: NAME: KECK, G						
THE DE		2		Compliance Items:	Y - Compliance N - Non-Compliance Blank - Not Evaluated		
	3		6	Complia Signs & La Source Con Refrigerato	ntainers		
BEN BEN	15	3	BENCH 7	L.S. Vials Waste Con Other Equ	ntainers ipment		
The state of the s	16	1	8				
	INK	19 ->	9 10 HOOD	Routine us	se of Lab Coats		
	5	1	11	Adequate Prohibitionetc.	n of eating, drinking,		
LOCATION: 1 2 Nuclide 1 PPM Nuclide 2	ipe Sample Results 3 4 5	6 7	8 9 10	Survey Re	Trained n on Mouth Pipetting		
Nuclide 3 Nuclide 4 Note: All wipe sample results	are in units of DPM / 1	100 sq. cm.		Contamin < 100 D Survey Instrumen	ation (Wipes) PM/100 sq. cm.		
CLOSE OU7	- SURVEY			00	Operational Available Other (Specify in Comments)		
					ES1 Form HPS.1 Rev 1.0 1/92		

FOR: FDA JOB: Bldg FB8 Room 1866 SAMPLE TYPE: Gross Alpha/Beta

DATE: 07-13-92 BY: ELW

NR	SAMPLE ID	GROSS CT	CT TIME	EFF	DFM	nci
1	31	45	1.00	0.28	MDA	MDA
	#2	36	1.00	0.26	MDA	< MDA
3	#3	49	1,00	0.29	< MDA	MDA MDA
4	#4	38	1.00	0.29	MDA	< MDA
5	#5	34	1,00	0.29	< MDA	< MDA
6	#6	41	1.00	0.29	« MDA	< MDA
7	#7	31	1.00	0.28	< MDA	< MDA
8	#8	41	1.00	0.28	< MDA	< MDA
9	#9	28	1,00	0.30	C MDA	C MDA
10	#10	41	1.00	0.28	< MDA	C-MDA
11	#11	-32	1.00	0.28	< MDA	< MDA
12	#12	50	1.00	0.29	< MDA	< MDA
13	#13	31	1.00	0.28	< MDA	MDA
14	#14	28	1.00	0.30	K MDA	< MDA
15	#15	45	1.00	0.29	K MDA	< MDA
16	#16	31	1.00	0.29	< MDA	< MDA
17	#17	41	1.00	0.30	< MDA	< MDA
18	#18	31	1.00	0.30	< MDA	< MDA
19	#19	35	1.00	0.26	< MDA	< MDA
20	#20	37	1.00	0.27	< MDA	< MDA

草南南年原本京南京北京東京東京東京東京東京東京東京東京北京北京東京

COUNTER:			DETEC	

BACKGROUND DATA: 34.00 (+- 33.6%) CPM

EFFICIENCY DATA:

MEAN EFFICIENCY: 0.28+-(5.0%)

MDA DATA: 27 CTS FOR 1 MIN 104 DPM 4.68E-05 UCI

PRECISION OF MEASUREMENTS: 95% CONFIDENCE LEVEL

COLOGY SERVICES, INC. 3001 Second St., Laurel, Maryland (301) 498-1514	O Second St., Laurel, Maryland 20707			•		
	ATION SAFETY	SURVEY		Building / Room: FB · 8 / 1	ding / Room: B · 8 1830	
Authorized Investigate	NAME:			Phone No.	Date: 7-9-92	
Surveyor:	NAME: KECK,	9		Phone No. 498 -1514	Survey Meter Used 472 68 43 40/44-3	
20 DESK	CABINET		24		Y - Compliance N - Non-Compliance Blank - Not Evaluated	
19 18 22 BENCH 17	13 8	25	BENCH 4	Signs & La Source Cor	tainers r / Freezer tainers pment Paper	
16 DESK 28	Structus and make an observed a contract	26- 27- REFG	2 HCCD	Routine us Routine us Adequate Prohibition etc.	e of Lab Coats	
LOCATION: Nuclide 1	2 3 4 5	6 7 / 100 sq. cm.	8 9 10	Survey Re Personnel Prohibitio Radiation Contamin <100 D Survey Instrument	cords Current Trained n on Mouth Pipetting Levels ation (Wipes) PM/100 sq. cm.	
CLOSEC	NT SURVE	7		00	Other (Specify in Comments) ESI Form HPS.1 Rev 1.0 1/9	

FOR: FDA JOR: Bldg FB8 Room 1830 SAMPLE TYPE: Gross Alpha/Beta

DATE: 07-13-92 BY: ELW

NE	SAMPLE ID	GROSS CT	TIME	EFF	DPM	UC1
	#1	49	1.00	0.26	MDA	< MDA
1 2	#2	27	1.00	0.28	< MDA	< MDA
	#3	47	1.00	0.26	C MDA	- K MDA
4	#4	38	1.00	0.29	< MDA	< MDA
5	#5	35	1.00	0.29	< MDA	< MDA
6	#6	76	1.00	0.29	K MDA	< MDA
7	#7	37	1.00	0.28	K MDA	< MDA
8	#8	23	1.00	0.30	< MDA	MDA
9	#9	30	1.00	0.30	< MDA	K MDA
10	#10	46	1.00	0.28	< MDA	O MDA
711	#11	32	1.00	0.29	K MDA	K MDA
12	#12	40	1.00	0.30	K MDA	MDA
13	#13	36	1,00	0.28	K MDA	< MDA
14	#14	38	1.00	0.28	K MDA	MDA
15	#15	28	1.00	0.29	< MDA	< MDA
16	#16	41	1.00	0.29	< MDA	K MDA
17	#17	31	1.00	0.29	K MDA	< MDA
				0.28	C. Sarah L. C.	< MDA
18	#18	41	1,00			C MDA
19	#19	42	1.00	0.29	< MDA	
20	#20	41	1.00	0.28	< MDA	< MDA

COUNTER: Beckman	Model LS 100C	DETECTOR: LSC
------------------	---------------	---------------

BACKGROUND DATA: 34.00 (+- 33.6%) CFM

EFFICIENCY DATA:

MEAN EFFICIENCY: 0.29+-(5.0%)

MDA DATA: 27 CTS FOR 1 MIN 106 DPM 4.79E-05 UCI

PRECISION OF MEASUREMENTS: 95% CONFIDENCE LEVEL

FOR: FDA JOB: Bldg FB8 Room 1830 SAMPLE TYPE: Gross Alpha/Beta

DATE: 07-13-92 BY: ELW

NR	SAMPLE ID	GROSS CT	CT	EFF	DPM	uci
1 2 3 4 5 6	#21 #22 #23 #24 #25 #26	24 40 36 37 44 33	1.00 1.00 1.00 1.00 1.00	0.29 0.29 0.30 0.29 0.29 0.27	<pre> MDA MDA MDA MDA MDA MDA MDA MDA</pre>	MDA MDA MDA MDA MDA MDA
7 -8 -9 10	#27 #28 #29 #30	23 34 29 29	1.00 1.00 1.00 1.00	0.28 0.29 0.29 0.29	K MDA K MDA K MDA K MDA	< MDA < MDA < MDA < MDA

COUNTER: Beckman Model LS 100C DETECTOR: LSC

BACKGROUND DATA: 34.00 (+- 33.6%) CPM

EFFICIENCY DATA:

MEAN EFFICIENCY: 0.29+-(5.0%)

MDA DATA: 27 CTS FOR 1 MIN 106 DPN 4.79E-05 UCI

PRECISION OF MEASUREMENTS: 95% CONFIDENCE LEVEL

ECOLOGY SERVICES, INC. 300 Second St., Laurel, Maryland 20707 FDA (301) 498-1514				
	Building / Room: FB-8/1	Building / Room: FB-8 / 1858		
Authorized Investigator: NAME:	Phone No.	Date: 7-9-92		
Surveyor: NAME: KECK, G	Phone No. 498-1514	Survey Meter Used 212 W/43-68 23 W/44-3		
## 10 17 6 8 17 6 8 16 17 6 8 16 17 14 15 15 17 14 17 17 17 17 18 18 18 18	Compliance Items: Y N	Y - Compliance N - Non-Compliance Blank - Not Evaluated Ince Items: bels: Room stainers r / Freezer tainers pment Paper Hood Flow Personnel Monitoring te Waste Management radionuclide Storage te of Gloves te of Lab Coats tuse of Shielding the of eating, drinking, & Disposal Records tecords Current Trained the on Mouth Pipetting Levels ation (Wipes) PM/100 sq. cm.		
* *1,2+3 ON CABINET SHELVES	Second Second	Comments) ESI Form HPS 1 Rev 1.0 1/92		

FOR: FDA JUB: Bldg FB8 Room 1858 SAMPLE TYPE: Gross Alpha/Beta

DATE: 07-13-92 BY: ELW

MR	SAMPLE (D	GRDSS CT	CT	EFF	DPM	nci
	#1	29	1.00	0.30	K MDA	K MDA
F 2	#2	31	1,00	0.29	K MDA	MDA MDA
	#3	47	1.00	0.29	K MDA	MDA
4	#4	4.5	1.00	0.29	< MDA	(MDA
5	#5	43	1.00	0.30	C MDA	K MDA
	#6	35	1.00	0.29	K MDA	< MDA
	#7	45	1.00	0.26	< MDA	K MDA
	#8	45	1.00	0.29	< MDA	C MDA
	#9	52	4.00	0.28	K MDA	4 MDA
10	(株式の)	26	1.00	0.28	K MDA	* MDA
11	#11 -	35	1.00	0.29	K MDA	C MIA
112-	#12	36	1,00	0.27	K MDA	MDA
13	#15	49	1,700	0.25	K MDA	C MDA
1.4	#14	37	1.00	0.23	K MDA	< MDA
15	#15	55	1,00	0.30	K MDA	MDA
16	#16	39	1.00	0.29	K MDA	< MDA
17	#17	38	1.00	0.30	< MDA	K MDA
18	#18	32	1,00	0.30	< MDA	< MDA
19	#19	39	1.00	0.29	< MDA	< MDA
	#20	41	1.00	0.29	K MDA	< MDA

COUNTER: Beckman Model LS 100C DETECTOR: LSC

BACKGROUND DATA: 34.00 (+- 33.6%) CFM

EFFICIENCY DATA:

MEAN EFFICIENCY: 0.28+-(5.0%)

MDA DATA: 27 CTS FOR 1 MIN 116 DPM 5.24E-05 UCI

FRECISION OF MEASUREMENTS: 95% CONFIDENCE LEVEL

ECOLOGY SERVICES, INC. 300 Second St., Laurel, Maryland 207 (301) 498-1514	400,000	ipany Name: FDA	•	
RADIAT	ION SAFETY SURV	EY	Building / Room: FB-8 /	3046
Authorized Investigator:	NAME:		Phone No.	Date: 7/9/9Z
Surveyor:	Phone No. 498-1514	Survey Meter Use L 12 W/43-68		
DESK	14		pers. pers.	Y - Compliance N - Non-Compliance Blank - Not Evaluated
FREEZER 18	BENCH 7 4 12 CABINET 11 19 DESK	BENCH 3 SINK F 1 HOOD Z	Signs & La Source Cor Refrigerato L.S. Vials Substance Absorbent Adequate I Radioactiv Routine us Adequate I	tainers tainers tainers pment Paper Hood Flow Personnel Monitoring waste Management radionuclide Storage e of Gloves
LOCATION: Acc 2 Loo Dept Nuclide 2 Nuclide 3 Nuclide 4 Note: All wipe sample results			Inventory Survey Re Personnel Prohibition Radiation Contamina < 100 DI Survey Instrumen	Trained on Mouth Pipetting Levels ation (Wipes)

FOR: FDA JOB: Bldg FBu Room 3046 SAMPLE TYPE: Gross Alpha/Beta

DATE: 07-13-92 BY: ELW

NR	SAMPLE 10		TIME	EFF	DPM	UC1
	#1	40	1.00	0.29	K MDA	MDA
	#2	4.3	1.00	0.28	MDA	MDA
연기들이	#5	39	1.00	0.30	MDA	K MOA
A A	#4	31	1.00	0.29	MDA	K MDA
	#5	38	1.00	0.29	MDA	MDA
5						MDA
6	#6	35	1.00	0.29		
	#7	41	1.00	0.29	MDA	C MDA
	雅号 二	72	1,00	0.29	NDA	MDA
9	#9	27	1.00	0.29	- < MDA	K MDA
10	#10	27	1.00	0.28	< MDA	< MDA
11	#11	32	1.00	0.29	MDA	= MDA
12	#12	30	1.00	0.26	MDA	ACM >
17	#13	38	1.00	0.30	T K MDA	MDA
14	#14	39	1.00	0.28	- C MDA	< MDA
15	#15	40	1.00	0.27	s MDA	< MDA
16	#16	35	1.00	0.29	C MDA	< MDA
17	#17	29	1,00	0.28	< MDA	C MDA
18	#18	27.	1.00	0.29	K MDA	K MDA
19	#19	45	1.00	0.29	K MDA	C MDA
20	#20	36	1.00	0.30	K MDA	< MDA

SHE SHELL THE SHE WAS DOING TO THE SHELL THE S	of a construction of Back to a		2 36 36 36		gardinant grand gr
COUNTER: Bec		75 459 3 5-4		\$ 500 F 180 F	1.184 1 1 1911
CONTRACTOR OF THE PARTY OF THE		had the die been part	A STATE OF	Ball Sour Sept Sec.	Total Co. Sec. Sec. Sec. Sec.

BACKGROUND DATA: 35.00 (+- 33.1%) CPM

EFFICIENCY DATA:

MEAN EFFICIENCY: 0.29+-(5.0%)

MDA DATA:

28 CTS FOR 1 MIN 101 DPM 4.53E-05 UCI

PRECISION OF MEASUREMENTS: 95% CONFIDENCE LEVEL

ECOLOGY SERVICES, INC. 300 Second St., Laurel, Marylan (301) 498-1514	100,000	Compa	ny Name: FDA	•			
RADI	Building / Room: FB-8 /	3058					
Authorized Investigate	vor:			Phone No.	Date: 7-9-92		
Surveyor:	Surveyor: KECK, G			Phone No. 498-1514	Survey Meter Used 212 4/43-68		
18 DESK	FREEZER	64	REFR.	and and	Y - Compliance N - Non-Compliance Blank - Not Evaluated		
10	15		LOCKER FILE CABINET	Signs & La Source Cor Refrigerato	atainers		
BENCH	14	19	SINK + 5	L.S. Vials Waste Containers Other Equipment Absorbent Paper			
8	13		BENCH	Adequate Hood Flow Adequate Personnel Monitoring Radioactive Waste Managemen Adequate radionuclide Storage Routine use of Gloves			
16 4	1,2 11 ~ \ LIGHTS 2	AND DESCRIPTION AND DESCRIPTION OF THE PARTY	1	Routine us			
LOCATION: 1 Nuclide 1 Nuclide 2	Wipe Sample Results	ults:	8 9 10	☐ ☐ Inventory ☐ ☐ Survey Re ☐ ☐ Personnel	Trained n on Mouth Pipetting		
BUT RESERVED A STREET	esults are in units of DPM	/ 100 sq. cm		Contamina < 100 Di Survey Instrumen	ation (Wipes) PM/100 sq. cm. t: Calibration Current		
Comments: Unable to per Room corre	form a complently in us	lete cla	secret.	00	Operational Available Other (Specify in Comments)		
					ESI Form HPS.1 Rev 1.0 1/92		

FOR: FDA JOB: Bldg FB8 Room 3058 SAMPLE TYPE: Gross Alpha/Beta

DATE: 07-13-92 BY: ELW

NR	SAMPLE ID	GROSS CT	CT	EFF	DFM	UC1
	#1	30	1,00	0.29	< MDA	K MDA
	#2	22	1.00	0.30	MDA	< MDA
3	#3	31	1.00	0.28	< MDA	< MDA
4	#4	33	1.00	0.30	< MDA	MDA
	#5	32	1.00	0.28	K MDA	< MDA
6	#6		1.00	0.28	MDA	K MDA
7	#7	36	-1.00	0.28	MDA	K-MDA
	#8	45	1.00	0.29	K MDA	< MDA
9	#9	. 54	1.00	0.29	K MDA	K MDA
	#10	46	1,00	0.29	< MDA	MDA -
11	Fig. #11	38	1,00	0.28	MDA	< MDA
12	#12	29	1.00	0.28	K MDA	C MDA
13	#13	32	1.00	0.29	MDA	K MDA
14	#14	28	1.000	0.28	< MDA	< MDA
15	#15	39	1.00	0.29	MDA	< MDA
16	#16	26	1.00	0.29	< MDA	< MDA
17	#17	32	1.00	0.29	K-MDA	< MDA
18	#18	27	1,00	0.29	< MDA	< MDA
19	#19	25	1.00	0.28	< MDA	< MDA
20	#20	26	1.00	0.28	< MDA	< MDA

COUNTER: Beckman Model LS 100C DETECTOR: LSG	COUNTER:	Beckman	Model.	LS 100	00	DETECT	OR: L	SC
----------------------------------------------	----------	---------	--------	--------	----	--------	-------	----

BACKGROUND DATA: 35.00 (+- 33.1%) CPM

EFFICIENCY DATA:

MEAN EFFICIENCY: 0.29+-(5.0%)

MDA DATA: 28 CTS FOR 1 MIN

99 DPM 4.46E-05 UCI

PRECISION OF MEASUREMENTS: 95% CONFIDENCE LEVEL

ECOLOGY SERVICES, INC. SKI Second St., Laurel, Muryland 20707 (301) 498-1514 Company Name: FDA		
RADIATION SAFETY SURVEY	Building / Room: FB · 8 / 6	082 A
Authorized Investigator: NAME:	Phone No.	Date: 7-9-92
Surveyor: NANIE: KECK, G	Phone No. 498-1514	Survey Meter Used 612 6/43-68 63 6/AC-3
DESK 18 1 20 6082	proce, grown,	Y - Compliance N - Non-Compliance llank - Not Evaluated
Wipe Sample Results: LOCATION: 1 2 3 4 5 6 7 8 9 10 Nuclide 3 Nuclide 3 Nuclide 4 Note: All wipe sample results are in units of DPM / 100 sq. cm.	Signs & Lab Source Cont Refrigerator L.S. Vials Susset Conta Contaminat Cont	tainers / Freezer ainers ment aper ood Flow ersonnel Monitoring Waste Management adionuclide Storage of Gloves of Lab Coats se of Shielding of eating, drinking, Disposal Records ords Current Trained on Mouth Pipetting evels ion (Wipes) M/100 sq. cm. Calibration Current
Onable to perform a complete closeast. Room currently in use.	000	Operational Available Other (Specify in Comments)
	E2	51 Form HPS 1 Rev 1.0 1/92

FOR: FDA JOB: Bldg FBB Room 6082-A SAMPLE TYPE: Gross Alpha/Beta

DATE: 07-10-92 BY: ELW

NF.	SAMPLE ID		CT	EFF	DPM	UC I
3	#]	39	1.00	0.27	MDA	< MDA
	#2	28	1,00	0.27	K-MDA	K MDA
2	#3	37	1.00	0.29	< MDA	* MDA
. A	#4	22	1.00	0.29	< MDA	< MDA
5	#5	28	1.00	0.28	< MDA	< MDA
6	#6.	42	1,00	0.30	< MDA	K MDA
	#7	2.3	1.00	0.29	< MDA	< MDA
	#8	30	1.00	0.29	< MDA	< MDA
9	#9	27	1.00	0.29	< MDA	< MDA
10	第10	44	1.00	0.28	MDA	< MDA
11	#11	4.4	1.00	0.28	< MDA	K MDA
12	#12	37	1.00	0.26	K MDA	MDA
13	#13	41	1,00	0.27	< MDA	C MDA
1.1	#14	34	1,00	0.29	< MDA	< MDA
15	#15	38	1.00	0.29	< MDA	< MDA
16	#15	34	1.00	0.27	< MDA	< MDA
17	#17	31	1.00	0.29	< MDA	< MDA
18	#18	31	1.00	0.30	MDA	< MDA
19	#19	29	1.00	0.28	< MDA	< MDA
20	#20	58_ 14	1.00	0.29	MDA	K MDA

COUNTER.	Barbana	Northeat	1 63 1	000	DETECTOR:	1 55
Section for the Land of the	AND STREET	LICIO EL T	Ju 22 L		DETELLION:	1.36

BACKGROUND DATA: 45.00 (+- 29.2%) CPM

MEAN EFFICIENCY: 0.28+-(5.0%)

MDA DATA: 31 CTS FOR 1 MIN 119 DPM 5.34E-05 UCI

PRECISION OF MEASUREMENTS: 95% CONFIDENCE LEVEL

ECOLOGY SERVICES, INC. 300 Second St., Laurel, Maryland 207 (301) 498-1514	707	Company N	FDA	•	
A STATE OF THE STA	ION SAFETY S	URVEY		Building / Room: FB-8/	6082
Authorized Investigator:	Phone No.	Date: 7-9-92			
Surveyor:	NAME: KECK,		Phone No. 498-1514	Survey Meter Used 212 W/43-68 23 W/AC-3	
← TO 6082 A	14		DESK	parents parents	Y - Compliance N - Non-Compliance Blank - Not Evaluated
DESK 15 BENCH 16 HOOD	BENCH 2		BENCH 20 FLAMMABLE STORAGE	Signs & Lal Source Con Refrigerator L.S. Vials Source Cont Cont Cont Cont Cont Cont Cont Cont	tainers t / Freezer tainers pment Paper Lood Flow Personnel Monitoring Waste Management actionuclide Storage of Gloves of Lab Coats
II REFR.	LOCKERS /ipe Sample Result. 3 4 5	6 7 8	9 10	Prohibition etc. Inventory & Survey Rec	© of eating, drinking, © Disposal Records cords Current Trained on Mouth Pipetting
Note: All wipe sample results Comments: Unable to pera Room current	100000m 不 数1460		bseout.	Survey Instrument	M/100 sq. cm.
			rhia rail dia	E	ISI Form HPS 1 Rev 1.0 1/92

FOR: FDA JOB: Bldg FBB Room 6082 SAMPLE TYPE: Gross Alpha/Beta

DATE: 07-13-92 BY: ELW

	SAMPLE ID	GROSS CT	CT TIME	EFF	DPM	ncı
	41	40	1.00	0.28	C MDA	< MDA
2	#2	27	1,00	0.28	< MDA	< MDA
- 3	#3	45	1.00	0.28	< MDA	< MDA
4	#.4	29	1.00	0.29	< MDA	< MDA
5	#5	28	1.00	0.28	< MDA	C MDA
6	#6	26	1.00	0.29	< MDA	MDA MDA
7	#7	31	1.00	0.28	- 4 MDA	K MDA
	#8	25	1.00	0.29	< MDA	K MDA
	#9	35	1.00	0.29	K-MDA	< MDA
1200	#10	40	1.00	0.29	< MDA	MDA
11	#11	25	1.00	0.28	< MDA	K MDA
12	#12	29	1.00	0.29	K MDA	K MDA
13	#15	32	1.00	0.29	C MDA	< MDA
14	#14	37	1.00	0.29	< MDA	< MDA
15	#15	54	1.00	0.28	< MDA	< MDA
16	#16	36	1.00	0.29	< MDA	< MDA
17	#17	34	1.00	0.28	< MDA	< MDA
18	#18	26	1.00	0.28	< MDA	K MDA
19	#19	28	1.00	0.29	< MDA	< MDA
20	#20	37	1.00	0.27	< MDA	< MDA

COUNTER:	Beckman	Model	LS	100C	DET	ECTOR:	LSC

BACKGROUND DATA: 35.00 (+- 33.1%) CPM

EFFICIENCY DATA:

MEAN EFFICIENCY: 0.28+-(5.0%)

MDA DATA:

28 CTS FOR 1 MIN 102 DPM 4.58E-05 UCI

PRECISION OF MEASUREMENTS: 95% CONFIDENCE LEVEL

RADIATION	SAFE	TY S	URVE	Υ				BLD	G-	RX	RO	OM NO.
AUTHORIZED INVESTIGATOR	NAME (last, first initial)						PHC	NE NO.		DATE (month, day, year)		
SURVEYOR		last, first					PHC	NE NO.				43.68
	A CONTRACTOR OF THE STATE OF		FZ	ON THE REAL PROPERTY AND ADDRESS AND ADDRE		>		COMPLIA	NCE	ITEMS		COMPLIANCE VIOLATION
			3			DES	»K 1	H				
						Γ		(2)	Soun	s & lables ce contain gerator/fr	ners	
ZFR 3		9)	4) 6				NC.	(4) (5)	(4) LSC vials (5) Waste containers			
		B							Abso	r equipm orbant pap e areas)		on radi on ucli d
	E						E	(9) }	(8) Adequate hood flow (9) Hood air flow in calibration (10) Adequate personnel external			
(5)		C							171	onitoring		nei external managemen
		H				SIN	a E	(12)	Rot	equate ra utine use	dionu of gl	oves
				(8)	14			(15)	Shi	utine use elding, if hibition o	requ	
Sink						100		(17)	an Inv	id smokin entory/di	g 3 p o 3 t	al records
-URE /	(10)			9) BYN 1	1	700		(19)	Per	vey recor sonnel tr hibition o	ain e d	
MEAR RESULT			in the	NACOS CONTRACTOR IN	(a) do	own th	ne i		me	ents		neets require
de of the table. All			-	T		MATERIAL PROPERTY.			Cor	diation lev ntaminatio 100 dpm		2.5 mR/hr mears)
CATION 1	2 3	4 5	6	7	8	9	10		Cali	bration c vey mete		
JULIUE LA NO								the second second		vey mete		
JCLIDE 1 KIOO DPM							-7					IN REMARKS

REMARKS: (Refer to item No. . Include violations corrected by supervisor.)

ECOLOG	GY SIRVI	ICES,	INC.	MAAN	NAME	FI	A	
RADIATION	SAFETY SURV	/EΥ		BLDG .	B8		DM NO.	
AUTHORIZED INVESTIGATOR	NAME (last, first initial)		PHONE	NO.			, day, year	
SURVEYOR	NAME (last, first initial) 2 wenge, June		PHONE	E NO.			ER USED 4368	
LOCATION		e nuclide(9) do	FOR FOR	(1) Sigr (2) Sou (3) Refr (4) LSC (5) We3 (6) Oth (7) Ab3 (8) Ade (9) Hoo (10) Ac (11) Ra (12) Ac (13) Rc (14) Rc (15) Sh (16) Pr (18) Sc (19) Pc (20) Pr (21) Cc (23) Cc (24) Cc	ns & lable ince containing erator / / / vials ite containing erator / vials ite contai	N=\\ s: roo iners freezer ners nent aper (conditions) waste adionu e of gli e of lai if requi of eati ing dispose ords cutrained on mo orage n evels < current	ibration we ibration mel externion managem clide stora oves becoats ired ng, drinkir al records urrent outh pipett neets requirent 2.5 mR/hr mears)	clide al alent age
NUCLIDE 1 CIOO DPM -			7	(26) S (27) O	urvey met ther (SPI	ers av ECIFY	ailable IN REMAF	RKS)
NUCLIDE 3			ME	ETER 1	METER	3 2	METER	3

ECO!		G	Y	SI	RI	VI(CE	S,	IN	IC	. 1	MF	MAC	Y NAME	FI	SA	
RADIATI	ON	S	AFE	TY	SUF	RVE	Υ					BLDG	<u> </u>	B8	-	OM NO	
AUTHORIZE INVESTIGATO		N	AME (last, f	irst init	ial)	-			PHONE NO. DA				TE (month, day, year)			
SURYEYOR		N	AME (last 1	irst init CK	ial)	G	7		PH	ONE	NO.		SURVEY L/2			
			-		1	1					COM	IPLIAN	ICE	ITEMS		COMPL	
			5		1						X N						
MEAR RES		Sin	DPA.		(6) in	Zha.	4	f	OK VE			(3) R (4) L (5) W (6) C (7) A (8) A (9) H (10) (11) (12) (13) (14) (15) (16) (17) (18) (19) (19) (19)	yest other base was a decided and a decided	ce contain gerator/fivials e contain requipm rbant pa e areas) quate horizontoring dioactive requate rautine use elding, if hibition contains around the tory/divey reconsonnel traition at original around the tory/diversity at the tory/diversi	reeze iers ent per (od flo in ca erson of ga of la requol ent gapos rds c rainecon mo	on radio	emal gement torage nking, ds
side of the tab		-)							ment in	Cor	diation lev			/hr
LOCATION	1	2	3	4	5	6	7	8	9	10		min	Cali	100 dpm bration c vey mete			al
7	0012 M9D				>							(26)	Sur	vey meter er (SPE	ers av	railable	
NUCLIDE 2						.1					MET	ER	1	METER	2	METE	R 3
NUCLIDE 3																	

RADIATI	ON SAFET	YSURVEY		Building / Room: FB-8/	
Authorized Investigator:	NAME:	BEN		Phone No.	Date: 7-9-92
Surveyor:	NAME:	K, G		Phone No.	Survey Meter Use 4.12 4/43-68 4.3 4/AC-3
	BENCH BENCH HOOD Tipe Sample Re	9 Kip	REFR.	Comp. Comp. Signs & I Source C Refrigera L.S. Viale Waste Co Absorber Adequate Adequate Radioacti Routine in Adequate Adequate Adequate Area Inventory	ontainers tor / Freezer sontainers uipment at Paper e Hood Flow e Personnel Monitoring ive Waste Management e radionuclide Storage use of Gloves use of Lab Coats e use of Shielding on of eating, drinking, y & Disposal Records
Nuclide 1 Nuclide 2 Nuclide 3 Nuclide 4 Note: All wipe sample results a Comments: A lab rech was ob OrnER: IK gepm for nothing det	served ca	rryng a c	up of cot	Radiation Contamin < 100 I Survey Instrume	el Trained on on Mouth Pipetting n Levels nation (Wipes) DPM/100 sq. cm.

ECOLOGY SERVICES, INC. 300 Second St., Laurel, Maryland 2070 (301) 498-1514	7	Сотралу Na	FDA	•			
RADIATIO	ON SAFETY SU	RVEY		Building / Room: FB-8 / 3028			
Authorized Investigator:	Phone No.	Date: 7-9-92					
Surveyor:	Phone No. 1198-1514	Survey Meter Used LIZ 68					
17	BENCH 16	9		Compliance Items:	Y - Compliance N - Non-Compliance Blank - Not Evaluated		
SINK # 20	BENCH LAMMABLE STORAGE TO Sample Results. 3 4 5 6 Tree in units of DPM / 10	Z	BENCH 15 14 SINK 13 12 HOOD 11 9 10 Seart	Signs & La Source Co Refrigerate L.S. Vials Source Co Refrigerate L.S. Vials Surve Equ Absorbent Adequate Adequate Radioactiv Routine us Routin	ntainers or / Freezer ntainers ipment Paper Hood Flow Personnel Monitoring we Waste Management radionuclide Storage se of Gloves se of Lab Coats use of Shielding n of eating, drinking, & Disposal Records ecords Current Trained n on Mouth Pipetting Levels ation (Wipes) PM/100 sq. cm.		

ECOLOGY SERVICES. INC. Data Frocessing REPORT OF SAMPLE ANALYSIS

FDR: FDA JOB: Bldg FB8 Room J028 SAMPLE TYPE: Gross Alpha/Beta

DATE: 07-13-92 BY: ELW

NR	SAMPLE ID	GROSS CT	CT TIME	EFF	DPM	nci
1 5	#1	35	1.00	0.29	< MDA	K MDA
2	#2	31	1.00	0.29	K MDA	MDA
4.4	#3	35	1.00	0.30	K MDA	K MDA
4	市4	52	1.00	0.28	K MDA	< MDA
5	#5	27	1.00	0.28	K MDA	MDA MDA
6	#6	37	1.00	0.29	< MDA	K MDA
7	#7	- 37	1.00	0.29	C MDA	K MDA
. 8	#8	40	1.00	0.29	< MDA	C MDA
9	#9	29	1.00	0.28	K-MDA	- K MDA
10	#10	22	1.00	0.29	< MDA	MDA T
11	#11	32	1.00	0.27	< MDA	MDA
12	#12	27	1,00	0.29	< MDA	CMDA
13	#13	30	1.00	0.28	MDA	C MDA
14	#14	28	1.00	0.28	K MDA	- MDA
15	#15	37	- 1×00-	0.28	< MDA	MDA MDA
15	#16	52	1.00	0.29	K MDA	< MDA
17	#17	35	1.00	0.29	< MDA	< MDA
18	#18	22	1.00	0.28	< MDA	< MDA
19	#19	29	1.00	0.28	K MDA	< MDA
20	#20	36	1,00	0.28	< MDA	< MDA

COUNTER:	Beckman	Model	1.5	1000	DETECTOR:	TEF
			Nac ver	THE R. SHI SHAP	Art See 1 Sec. or 1 Sec. 5 P.	Sheet Sheet Street

BACKGROUND DATA: 35.00 (+- 33.1%) CFM

EFFICIENCY DATA:

MEAN EFFICIENCY: 0.28+-(5.0%)

MDA DATA: 28 CTS FOR 1 MIN 104 DPM 4.67E-05 UCI

PRECISION OF MEASUREMENTS: 95% CONFIDENCE LEVEL

HEALTH PHYSICIST

ECOLOGY SERVICES, INC. Data Processing REPORT OF SAMPLE ANALYSIS

FOR: FDA JOB: Bldg FB8 Room 3028 SAMPLE TYPE: Gross Alpha/Beta

DATE: 07-13-92 BY: ELW

NE	SAMPLE ID	GROSS CT	CT TIME	EFF	DFM	UCI
1 2 5 4 5	#21 #22 #23 #24 #25	35 30 34 33 29	1.00 1.00 1.00 1.00 1.00	0.28 0.28 0.28 0.28 0.28	< MDA < MDA < MDA < MDA < MDA	<pre></pre>

COUNTER: Beckman Model LS 1000 DETECTOR: LSC

BACK GROUND DATA: 35.00 (++ 53.1%) CPM

EFFICIENCY DATA:

MEAN EFFICIENCY: 0.28+-(5.0%)

MDA DATA: 28 CTS FOR 1 MIN 104 DPM 4.69E-05 UCI

PRECISION OF MEASUREMENTS: 95% CONFIDENCE LEVEL

HEALTH PHYSICIST

ECOLO	GY SERVICES,	INC.	IPANY NAME				
RADIATION	SAFETY SURVEY		BLDG	RX	ROOM NO. 6846		
AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE	NO.	DATE (month, day, year) 7-9-9-2			
SURYEYOR	NAME (last, first initial) KECK, G	PHONE	NO.	A STATE OF THE PARTY OF THE PAR	METER USED		
	IN	ca H cor	MPLIANCE	ITEMS '	Y=COMPLIANCE N=VIOLATION		
MEAR RESULTS de of the table. All s		9 10	(1) Sign (2) Sour (3) Refri (4) LSC (5) Wast (6) Othe (7) Abs (8) Ade (9) Hood (10) Ad (11) Rac (12) Ad (13) Ro (14) Ro (15) Shi (16) Pro (17) Inv (18) Sur (19) Per (20) Pro (21) Cor (21) Cor (22) Rac (23) Cor (24) Cal (25) Sur (26) Sur	te contained or equipme or bant pape e areas) quate hoord dair flow ir equate per nonitoring dioactive we quate rad utine use of the equate rad utine use of the equate rad utine use of the entory o	ers ezer ers nt er (on radionuclid d flow n calibration sonnel external easte management ionuclide storage of gloves of lab coats required eating, drinking, posal records ds current ned n mouth pipetting ge meets require- els < 2.5 mR/hr n (smears) rent s operational		

RADIATION	SAFE	TY SU	RVEY	the state transmitter dates non			BLDG	RX	R	DOM NO.	
AUTHORIZED NYESTIGATOR	NAME	(last, first in	itial)			PHONE	NE NO. DA		TE (month, day, year)		
SURVEYOR	NAME	(last, first in	itial)	6		PHONE	NO.	SURVE	Y ME	TER USE 43-6	
/						COM	IPLIANC	EITEMS	Y:	COMPLIA VIOLATIO	N C I
1 7	1		Non	RA	m	A M		ns & lable:			
			5707	RAG	E	#	(3) Refr (4) LSC	rce contai rigerator/fi vials ite contain	reez		
5 2	- American	6					(6) Oth (7) Abs us	er equipm orbant pa e areas)	ent per (on radion u	cli
五	WA	L L					(9) Hoo (10) Ad	quate how dair flow lequate pe nonitoring	in ca		8
AB. 3		h-W NAMESHAW	Street Street	apple of the same	Security of the Madeson	A A	(11) Ra (12) Ad	dioactive v	dion	e managem uclide ston lloves	
			AM/R			4	(15) Sh (16) Pr	utine use ielding, if phibition o	requ f eat		ng
4		8	atora	GE.	FJAZ		(17) Inv (18) Su (19) Pe	nd smokin entory/dis rvey recor rsonnel tn	ds c	urrent	
EAR RESULTS			the nucli	de(3) dow	M		(21) Co	midor ston ents	age 1	outh pipett meets requ : 2.5 mR/hr	uir
ATION 1	2 3	4 5	6 7	8	9 10		(23) Co (24) Ca	ntaminatio 100 dpm libration cu	n (s irren	mears) t	
DPM CLIDE 2 CIOO					->	1	(26) Su	rvey mete rvey mete her (SPE(73 8.V		1K
						MET	THE R. P. LEWIS CO., LANS.	METER	SONOS/HONOS	A STATE OF THE PARTY OF T	and the same

ECOLO	GY	SERV	VIC	ES,	II.	VC.			NY NAME	F	DA		
RADIATION	SAFET	Y SU	RVEY	,				BLDGF	B8		6445	3	
AUTHORIZED INVESTIGATOR	NAME (last, first in	itial)			Ph		ENO. DATE (month, d			h, day, ye	THE RESIDENCE OF SHARP SHAPE OF SHAPE O	
SURYEYOR		last, first in		mischaemaanie		PH	HONE	NO.	1	Y ME	TER USE	D	
FUGE					FZF	2	COM	IPLIANCE	EITEMS		COMPLIA		
DESK 3 SINK FUGE MEAR RESULTS ide of the table. All s			10 P	8 2 clide(3)	115	C C		(2) Sou (3) Refr (4) LSC (5) Was (6) Cin (7) Abs us (8) Ade (9) Hoo (10) Ad (11) Ra (12) Ad (13) Ro (14) Ro (15) Sh (16) Pro (17) Inv (18) Su (19) Pe (20) Pro (21) Co m (22) Ra	re container equipm orbant pare e areas) quate how equate proportioning dioactive requate rautine use ielding, if orbition or container or reconstruction or container to reconstruction o	ners reeze ners ent per (od flo in ca ers on of g of la requol spos rds c ainecon mage i	on radional ow dibration anel exten e manager uclide stor loves ab coats ured ing, drink al records urrent douth pipel meets rec	nal meni rage	
DCATION 1	2 3	4 5	6	7 8	9	10		<	ntaminatio 100 dpm libration c				
UCLIDES KIDO PAM						7	1	(25) Su (26) Su	rvey meter rvey meter her (SPE	ers of	perational railable	RKS	
UCLIDE 2							MET	d minimum manusch	METER	and produce	METER	DOSTANIOSE	

ECOLO	GY SLRVICES	s, INC			Y NAME	A	700
RADIATION	SAFETY SURVEY			BLDG_	38	ROOM NO.	
AUTHORIZED INVESTIGATOR	NAME (last, first initial)		PHONE	PHONE NO. DATE (month, day			
SURYEYOR	NAME (last, first initial) Lucengo, Juan		PHONE	NO.	SURVE	METER USE	
		SHEL	COM	IPLIANCE	EITEMS	Y=COMPLIAN N=VIOLATIO	
		,	YM				
DESK		DESH			ns & lable: rce contai		
			1		igerator/fi		
				(5) Was	te contain er equipm		
			-1525	(7) Abs		per (on radionu	clide
			Michael	(8) Ade	quate ho	od flow in calibration	
				(10) Ad		ersonnel extern	al
			PACCOUR !	(11) Ra	dioactive '	waste managem	
			1	(13) Ro	utine use	of gloves	rAc
		RE	R	(15) Sh	ielding, if	of lab coats required	
		/	100	1.8	nd smokir		ng,
Hood	/			(18) Su	rvey reco	sposal records rds current	
Oven	FLAMMARLE	Barran	KR KR	(20) Pro		on mouth pipett	
SMEAR RESULTS		s) down the	NAME OF THE OWNER, OWNE	m	ents	rage meets requels < 2.5 mR/hr	
LOCATION 1	2 3 4 5 6 7	8 9 1	0	(23) Co	ntamination 100 dpm	on (smears)	
NUCLIDE 1				(27) 6	libration c rvey mete	urrent ers operational	
14C						ers available CIFY IN REMAP	RKS
NUCLIDE 2			MET	THE REAL PROPERTY AND ADDRESS OF THE PERSONS OF THE	METER	AND THE PERSON NAMED IN COLUMN TWO IS NOT THE OWNER, TH	3
NUCLIDE 3				3/44-9			
	r to item No. Include violations or		1511	13127	-	CHECKSON AND DESCRIPTION AND DESCRIPTION OF THE PERSON AND DESCRIP	Section or company

NO RAM USED IN PAST 30 DAYS Rev. Oct 1990.

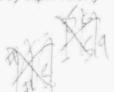
RADIATION	SAFET	Y SL	IRVE	Y				BLDG	FR8	100M NO. 8		
AUTHOFIZED NYESTIGATOR	NAME (I	ast, first in	nitial)				PHO	HONE NO. DATE (month, day, year 07-09-93				
SURVEYOR	NAME (I	ast, first in		w			PHO	ONE NO.	the same of the sa	METER USED		
\	FUGE				/	1-		COMPLIAN	CE ITEMS	Y=COMPLIANCE N=VIOLATION		
DESK		25			7	DES		(2) So (3) Re (4) LS (5) Wi (6) Ot	gns & lable ource conta frigerator/f C vials aste contair her equipm	ners reezer ners ent		
h a	2	Houn			D			(8) Ac (9) Ho (10) A (11) F (12) A	use areas) dequate ho cod air flow Adequate p monitoring Radioactive Adequate ra	in calibration ersonnel external waste managemen dionuclide storage		
TO01354	7	SINK 2	0					(14) F (15) S (16) F (17) II (18) S (19) F	Shielding, is prohibition of and smokin nventory! described the contract of th	of lab coats required of eating, drinking ng isposal records rds current rained		
MEAR RESULTS			n the n	uclid	e(a) d	own th	ne	(21) ((22) F	Corridor sto ments Radiation le	on mouth pipetting rage meets require vels < 2.5 mR/hr on (smears)		
CATION 1	2 3	4 5	6	7	8	9	10	L (24)	< 100 dpm Calibration o			
CLIDE 1 CIOO DPM -			-				>	[26]	Survey met	ers available CIFY IN REMARKS		
CLIDE 3								METER 1	METER	2 METER 3		
OCIDE 3								25 W/44 S/N 802				

FICUR IN FRONT OF BENCH

700 GCPM - 1740 DPM/100cm2

200 GCPM - 3913 DFM/100 cm2

10x 6cpm 42,174 ppm/100 cm2



Rev. Oct 1990

RADIATI	ON SAFETY	SURVE	Y	Building / R	
Authorized Investigator:	NAME:			Phone No.	Date: 6-24-92
Surveyor:	NAME: WATTS,	C		Phone No.	Survey Meter Us
SINK- CENT. RFG	ICE		BEZZCH	Y N O Sign Sort O Ref	N - Non-Compliance N - Non-Compliance Blank - Not Evaluate Compliance Items: Ins & Labels: Room Arce Containers Frigerator / Freezer S. Vials Aste Containers There Equipment Assorbent Paper Requate Hood Flow Requate Hood Flow Requate Personnel Monitorize dioactive Waste Manageme Requate radionuclide Storage outine use of Gloves outine use of Lab Coats Requate use of Shielding
LOCATION: 1 2 Nuclide 1 Nuclide 2 Nuclide 3 Nuclide 4 Note: All wipe sample results Comments:		6 7		0	ohibition of eating, drinking tc. ventory & Disposal Records arvey Records Current ersonnel Trained ohibition on Mouth Pipettin adiation Levels ontamination (Wipes) < 100 DPM/100 sq. cm. sstrument:

RADIATI	ON SAFETY SUR	VEY		Building / Room:	2418
Authorized Investigator:	Bronauch,	2		Phone No.	Date: 6-24-92
Surveyor:	Bronauch. NAME: WARTS, C			Phone No.	Survey Meter Use
RFG RFG		ESK			Y - Compliance N - Non-Compliance llank - Not Evaluate
	B E N C H Vipe Sample Results:	FLE	FILE '	Radioactive Adequate r Routine use Adequate use Adequate use Prohibition etc.	tainers I Freezer ainers pment Paper lood Flow ersonnel Monitoring Waste Management adionuclide Storage e of Gloves e of Lab Coats
LOCATION: 1 2 Nuclide 1 Nuclide 3 Nuclide 4 Note: All wipe sample results	3 4 5 6	7 8	9 10	Survey Re Personnel Prohibition Radiation Contamina < 100 Di Survey Instrumen	cords Current Trained on Mouth Pipetting Levels ation (Wipes) PM/100 sq. cm. t:
Comments:	se Since LA		16.51	00	Calibration Current Operational Available Other (Specify in

COLOGY SERVICE (KI) Second St., Laurel, (KI) 498-1514		. •	Compan	y Name:	-	FDA	
	RADIATI	ON SAFETY SU	URVEY		Bui	MOD Room	1 / 2321
Authorized Inv	estigator:	NAME: Brownigh	2		Pho	ne No.	bute: (s-24-92
Surveye	or:	NAME: S NATTS, C			Pho	one No.	Survey Meter Use
	DESI			H 6 8		N	ns: Y - Compliance N - Non-Compliance Blank - Not Evaluate
	6 DESK	B E N C H S CIGAR DESK		BENDE		Source (Refriger L.S. Via Waste C Other E Absorbe Adequa Adequa Radioad Routine Routine Adequa	ator / Freezer als Containers quipment
LOCATION: Nuclide 1 14 C Nuclide 2	1 2 < (CO) —	7 ipe Sample Result	6 7	8 9	10	Survey Person	ry & Disposal Records Records Current nel Trained ition on Mouth Pipetting
Nuclide 3 Nuclide 4	sample results	are in units of DPM /	100 sq. cm			< 100 urvey Instrum	nination (Wipes) DPM/100 sq. cm.
Comments: EXTINGUISHE PIPETTOR OF	D CIGAR U BENCE	on DESK; CONTAMINATED	PRESUM,	PTIVE EV	IDENCE D	a a	Operational Available Other (Specify in Comments) ESI Form HPS-1 Rev 1.0 1/

COLOGY SERVICES, INC. (XI) Second St., Laurel, Maryland 20707 (XII) 498-1514			- UA	
RADIATION SAFETY SURV	EY	Buildi	ng / Room:	1 / 2313
Authorized Investigator: Browningh,	15	Phone	No.	Co-24-92
Surveyor: NAME: NATTS C		Phone	No.	Survey Meter Use L3 W 44-9
LSC RFG	I H	Comp	1 1	Y - Compliance N - Non-Compliance Blank - Not Evaluate
FRZ 2 LSC L S S LSC C S S LSC C S G S LSC C S	BENCH FILTER HOUSING		Radioactive Adequate r Routine us Routine us Adequate us Prohibition etc.	tainers r / Freezer ainers pment Paper Hood Flow Personnel Monitorin e Waste Management radionuclide Storage
LOCATION: 1 2 3 4 5 6 Nuclide 1 P 1	7 8 9	10 0	Survey Re Personnel	cords Current Trained n on Mouth Pipettin
Nuclide 3 Nuclide 4			Contamina	ation (Wipes) PM/100 sq. cm.
Note: All wipe sample results are in units of DPM / 100 so	q. cm.	Sur	vey Instrumen	t: Calibration Current Operational Available
			00	Other (Specify in Comments)
				ESI Form HPS.1 Rev 1.0 1

ECOLOGY SERVICES, INC. 1401 Second St., Lourel, Maryland 2070 (2011) 448-1514	WARRING	mpany Name:	•	FDA	
	ON SAFETY SURV	EY	В	uilding / Room:	
Authorized Investigator:	RONAUGL.	R	P	none No.	Date: 6-24-92
Surveyor:	NAME: KECK, G		P	hone No.	Survey Meter Use
H000	TABLE			ompliance item	s: Y - Compliance N - Non-Compliance Blank - Not Evaluated
HOOOD 9 NOT LABELED	2	5 H 51 3		Signs & I Source C Refrigers L.S. Vial Waste C C Absorbe Adequat Radioac Radioac Routine Routine Adequa	Containers etor / Freezer ls containers quipment ent Paper le Hood Flow le Personnel Monitoring tive Waste Management te radionuclide Storage
LOCATION: 1 2 Nuclide 1 P		q, cm.	9 10 3	Survey Personn Prohibit Radiation 100 Survey Instrum	tion on Mouth Pipetting on Levels sination (Wipes) DPM/100 sq. cm.

x) Second St., Laur 901) 498-1514	el, Maryland	20707								Building / Room:	-
	RADIA	ATION	SAFI	ETY.	SUR	VEY				MOD	1/1107
Authorized In	vestigato	1	AME:							Phone No.	G-24-97
Surve	vor:	1	AME:	13	C					Phone No.	Survey Meter Use
			SHEL	.VE						Compliance Items: Y N	Y - Compliance N - Non-Compliance Blank - Not Evaluate
		11/2	Commen	In Dag	ulte					Radioacti Adequate Routine to Adequate Prohibition	ntainers ripment t Paper Hood Flow Personnel Monitorin ve Waste Managemen radionuclide Storage use of Gloves use of Lab Coats t use of Shielding on of eating, drinking
LOCATION:	1	2 3	Samp.	5	6	7	8	9	10		y & Disposal Records Records Current of Trained
Nuclide 1 Nuclide 2											on on Mouth Pipettin
Nuclide 3										Q Q Radiation	
Nuclide 4										Contami < 100 l	nation (Wipes) DPM/100 sq. cm.
Note: All wip	e sample re	sults are	in units	of DPN	1/100	sq. cm		1134		Survey Instrume	ent:
Comments:	that c					****					Calibration Current Operational Available Other (Specify in Comments)

	RADI	ATIC	ON SAF	ETY S	UR VE	Y			Building / Room: MOD 1	1 G414
Authorized In	vestiga	tor:	NAME:	surve					Phone No.	Date: 6-24-92
Surve	vor:		NAME: WATT	3, C					Phone No.	Survey Meter Us
Ho			ASE	R					The same of the sa	- Compliance - Non-Compliance ank - Not Evaluate
OD BHZC+			BEZCH	Lsc	RF	-G-	RFG		Signs & Labe Source Conta Refrigerator L.S. Vials Substance Absorbent P Adequate He Adequate Pe	iners / Freezer iners ment aper ood Flow resonnel Monitorin Waste Management dionuclide Storage of Gloves of Lab Coats se of Shielding
		W. 2	ipe Samp.	le Resul	ts:	8	9	10	etc. Inventory & Survey Record Personnel T	Disposal Records
LOCATION:	1								Prohibition	
	1								Prohibition Radiation L Contaminat	on Mouth Pipettin evels

COLOGY SERVICES, INC. WAN Second St., Laurel, Maryland 207. WII) 498-1514	07	Compan	y Nami	25	W	FDA	
RADIATI	ON SAFETY SU	VR VEY				Building / Room: NOD 1	2305
Authorized Investigator:	NAME: Browaugh	R				Phone No.	Date: 6-24-92
Surveyor:	NAME: NAME:					Phone No.	Survey Meter Use 13w 44-9
DE	SK FLAMM	(3)-2	JA.			and the same of th	Y - Compliance N - Non-Compliance Blank - Not Evaluate
9 8 E	C H G RFG DE					Radioactive Radioactive Routine us Routine us Adequate	tainers r / Freezer tainers pment Paper Hood Flow Personnel Monitorin the Waste Management adionuclide Storage the of Gloves
LOCATION: 1 2 Nuclide 1	Vipe Sample Result. 3 4 5	6 7	8	9	10	Survey Re	& Disposal Records cords Current Trained a on Mouth Pipettin
Nuclide 2 Nuclide 3						Radiation	
Nuclide 4						Contamina	ntion (Wipes) PM/100 sq. cm.
Note: All wipe sample results	are in units of DPM /	100 sq. cm.				Survey Instrumen	
Comments:							Operational Available Other (Specify in Comments) ESI Form HPS.1 Rev 1.0 1/2

Company Name: ECOLOGY SERVICES, INC. 3(X) Second St., Laurel, Maryland 20707 (301) 498-1514 Building / Room: RADIATION SAFETY SURVEY WASTE MOD Phone No. Date: NAME: 6-24-92 Authorized Investigator: FSAN SAFETY OFFICE Survey Meter Used Phone No. L3 W 44-9 Surveyor: WATTS Compliance Items: Y - Compliance N - Non-Compliance 00 Blank - Not Evaluated TABLE RAW Compliance Items: Signs & Labels: Room Source Containers ☐ ☐ Refrigerator / Freezer L.S. Vials Waste Containers Other Equipment Absorbent Paper Adequate Hood Flow Adequate Personnel Monitoring Radioactive Waste Management ☐ ☐ Adequate radionuclide Storage Routine use of Gloves Routine use of Lab Coats Adequate use of Shielding Prohibition of eating, drinking, Wipe Sample Results: Inventory & Disposal Records 1 2 3 10 4 5 Survey Records Current LOCATION: 4100 Personnel Trained Nuclide 1 Prohibition on Mouth Pipetting Nuclide 2 Radiation Levels Nuclide 3 Contamination (Wipes) Nuclide 4 < 100 DPM/100 sq. cm. Survey Instrument: Note: All wipe sample results are in units of DPM / 100 sq. cm. Calibration Current Operational Comments: Available Other (Specify in Comments) ES1 Form HPS 1 Rev 1.0 1/92

COLOGY SERVICES, INC. (X) Second St., Laurel, Maryland 20 (XII) 498-1514	707	Company	Name:		FDA	
	TON SAFETY S	URVEY			Building / Room: MOD \	13404
Authorized Investigator:	NAME: Sistare,	7			Phone No.	Date: 6-24-92
Surveyor:	NAME: WATTS, C				Phone No.	Survey Meter Use
6	7	2FG]	H 00			Y - Compliance N - Non-Compliance Blank - Not Evaluate
B E 5 4 3 L A 2 T	L S C BENCH ESK	16	BENCH		Signs & La Source Cor Refrigerato L.S. Vials Substance Con Absorbent Adequate Radioactiv Routine us Adequate Routine us Routine us	tainers r / Freezer tainers pment Paper Hood Flow Personnel Monitoring e Waste Management radionuclide Storage se of Gloves
LOCATION	Wipe Sample Results	lts:	8 9	10	1	& Disposal Records
LOCATION: 1 2	3 4 3		0 3	1	Personnel	ecords Current Trained
Nuclide 2					1	n on Mouth Pipetting
Nuclide 3					Radiation	
Nuclide 4						PM/100 sq. cm.
Note: All wipe sample resu	ts are in units of DPM	/ 100 sq. cm.			Survey Instrumen	nt: Calibration Current
Comments:					00	Operational Available Other (Specify in Comments) ESI Form HPS 1 Rev 1.0 1/2

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*

ECO		GY	S	Li	ŧV	IC	ES	5,	IN	C.	[C W	1A.9	IY NAME	-DA		
RADIATI	ON	SAI	FETY	/ 5	SUR	VEY	,				BL	DG C V	M	ROC	M NO. 103	
AUTHORIZE			VE (1a		- 0					PHO	NE NO		DATE (month,		er)
SURVEYOR		and the second second second	VE (IE	Santable Street,	-					PHO	NE NO),	SURVE	Y MET	. 175	O .
APPROXIMENT OF SURGESTAND STORES.		K.W.C.W.C.W.WAGON	M. M.C. MAY 15-15	esent consists	or successful AT	EROBBIGA SATE	SERVICE TO	PERSONAL PROPERTY.	STATUS ASSESSED. 140	C	OMPL	IANCE	EITEMS		OMPLIA	
SMEAR R side of the				- 15)			e(3) d	-(00)	ne	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	2) South 3) Ref 4) LSC 5) West 6) Oth 7) Abs 8) Ho A 10) A 11) A 12) A 13) R (15) S (16) P (20) F (21) C	ns & lable irce containing erator / 1 C vials ste contain er equipm corbant paragraph equate hord air flow dequate from onit oring adioactive dequate routine us outine us outine us hielding, rohibition and smok eventory / curvey recoversonnel Prohibition Comidor st ments Radiation I Contamina < 100 dpn	iners freezer ners nent aper (o vin cal vin cal verson vaste e of la if requiring dispos ords c traine on m orage evels lion (s	menage b coals lired ing, drir all record ument doubt pip meets re-	mel ement orage sking, is etting equire-
LOCATION	1	2	3	4	5	6	7	8	9	10	1	(24)	< 100 opr Calibration Survey me	currer	nt nemtion	el el
NUCLIDE 1	K100				-						*	(26)	Survey me Survey me Other (SF	eters a	vallable	
NUCLIDE 2	4100				-				-		MET	AND STREET, STREET, ST.	METE	DOMESTIC STATE OF THE PARTY OF	METE	
NUCLIDE 3																

Company Name: ECOLOGY SERVICES, INC. FDA 300 Second St., Laurel, Maryland 20707 (301) 498-1514 Building / Room: RADIATION SAFETY SURVEY MOD Phone No. Date: NAME: 6-24-92 SURVEY Authorized Investigator: BASELINE Survey Meter Used Phone No. NAME: 13 W 44-9 Surveyor: NATIS Compliance Items: Y - Compliance N - Non-Compliance Blank - Not Evaluated Compliance Items: Signs & Labels: Room ☐ ☐ Source Containers Refrigerator / Freezer L.S. Vials ☐ ☐ Waste Containers Other Equipment Absorbent Paper Adequate Hood Flow ☐ ☐ Adequate Personnel Monitoring Radioactive Waste Management Adequate radionuclide Storage Routine use of Gloves Routine use of Lab Coats 10 Adequate use of Shielding Prohibition of eating, drinking, Wipe Sample Results: Inventory & Disposal Records 7 LOCATION: 2 10 ☐ ☐ Survey Records Current Personnel Trained Nuclide 1 Prohibition on Mouth Pipetting Nuclide 2 Radiation Levels Nuclide 3 Contamination (Wipes) Nuclide 4 < 100 DPM/100 sq. cm. Survey Instrument: Note: All wipe sample results are in units of DPM / 100 sq. cm. Calibration Current Operational Comments: Available Other (Specify in Comments) ESI Form HPS.1 Rev 1.0 1/92

ECOLOGY SERVICES, N.C. Data Processing REPORT OF SAMPLE ANALYSIS

FOR: FDA JOB: MOD 1 Room 2319 SAMPLE TYPE: Gross Alpha/Beta

DATE: 06-24-92 BY: ELW

NA	SAMPLE ID	GROSS CT	CT	EFF	DFM	UCI
			1 700	0.30	MDA	s ADA
	#1		1.00			
2	#2	100	1.00	0.50	K MDA	MDA
	#5	26	1.00	0.31	MDA.	K MDA
4	JP 244 94	40	1.00	0.30	K_MDA	(MDA
5	#5	53	1.00	0.30	K MDA	< MDA
6	#6 · · ·	40	1.00	0.31	A MDA	C MDA
7	#7	40	1.00	0.30	< MDA	K MDA
8	#8	34	1.00	0.31	< MDA	< MDA
	#7	37	1.00	0.30	MDA	K MDA
10	#10	48	1,00	0.30	AL MDA	< MDA

COUNTER: Beckman Model LS 1000 DETECTOR: LSD

BACKGROUND DATA: 34.00 (+- 35.8%) CPM

EFFICIENCY DATA:

MEAN EFFICIENCY: 0.30+-(5.0%)

MDA DATA: 27 CTS FOR 1 MIN

27 CTS FOR 1 MIN 92 DPM 4.13E-05 UCI

PRECISION OF MEASUREMENTS: 95% CONFIDENCE LEVEL

HEALTH PHYSICIAT

OLOGY SERVICES, IN O Second St., Laurel, Mary. 17) 498-1514	C. land 20707		Company Nan	10:	FDA	
	DIA TIO	N SAFETY S	URVEY		Building / Room	1 / 2317
Authorized Investig		NAME:			Phone No.	(6-24-92
Surveyor:		NAME: WATTS, C			Phone No.	Survey Meter Used 13w 44-9
					Compliance Iter	ms: Y - Compliance N - Non-Compliance
FILTE	ER	4	FILTE	R	àâ	Blank - Not Evaluated
HOUSIN	G	H	OUSING		Signs &	pliance Items: Labels: Room
5		6	7			
8		9	10		Other Absort	Equipment
	_			3 \	Radio	active Waste Management thate radionuclide Storage the use of Gloves
					Adeq	ne use of Lab Coats uate use of Shielding bition of eating, drinking
		ipe Sample Ress	ults:	9 10		atory & Disposal Records
LOCATION: 1 Nuclide 1 B 410				+>	D Perso	onnel Trained
Nuclide 2						ibition on Mouth Pipettir
Nuclide 3						ation Levels amination (Wipes)
Nuclide 4					< 1	00 DPM/100 sq. cm.
Note: All wipe samp	le results	are in units of DPM	1 / 100 sq. cm.		Survey Instr	ument: Î 🔲 Calibration Currer
Comments:				and developed an extensive constraint and developed and de		Operational Available Other (Specify in Comments)
						ESI Form HPS.1 Rev 1.0

ECOLOGY SERVICES, INC. Data Processing REPORT OF SAMPLE ANALYSIS

FOR: FDA JOB: MOD 1 Room 2317 SAMPLE TYPE: Gross Alpha/Beta

DATE: 06-24-92 BY: ELW

NR	SAMPLE ID	GROSS	CT TIME	EFF	DFM	100
7	#1	40	1.00	0.29	C MDA	· MDA
2	B2 17	45	1.00	0.29	K MDA	MDA
	#3	24	1.00	0.29	MDA	- C MDA
4	##	28	1.00	0.29	K MDA	4 MDA
	#5	38	1.00	0.29	< MDA	< MDA
6	#a	39	1.00	0.30	< MDA	- MDA
7	#7	33	1.00	0.29	< MDA	C MDA
8	#8	33	1.00	0.29	< MDA	< MDA
9	#9	38	1.00	0.30	< MDA	< MDA
10	#10		1.00	0.29	<-MDA	< MDA

COUNTER: Backman Model LS 100C DETECTOR: LSC

BACKGROUND DATA: 34.00 (+- 33.6%) CPM

EFFICIENCY DATA:

MEAN EFFICIENCY: 0.29+-(5.0%)

MDA DATA:

27 CTS FOR 1 MIN 95 DFM 4.28E-05 LICI

PRECISION OF MEASUREMENTS: 95% CONFIDENCE LEVEL

HEALTH PHYSICE

RADIA	TION	SA	AFE"	TY	SU	RVE	Y					BLQG	K	RF.	RO	DOM NO.	2
AUTHORI IN YESTIGA		N/	AME (last, f	inst ini	itial)				P	HONE	Name and Address of the Park		DATE (mont	h, day, ye	ar)
SURVEY	OR	1 1		last, I	first ini	itial)				P	HONE	NO.		THE REAL PROPERTY.	ME	TER USE	D
			OUT THE THE THE	A STREET, CARRY CO.	35,600,000,000,904.00	IA POR SECRIPIO			STATE OF STA			IPLIAN	ICE	ITEMS		COMPLIA VIOLATIO	
									うトEL	\	YN	(2) S (3) R (4) L (5) W (6) O	efric SC aste	à lable: ce contai gerator/fi vials e contain r equipm	ners reeze ers ent	er	
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MODIAII	the same of the sa	ETY	SU	IRV	EY					ANY NA	- DA
AUTHORIZE	15141	(lest,	first in	itial)	-				BLDG	SRF	ROOM NO.
SURVEYOR	-	E (last,	first in	No. 1				PHONE	NO.	DATE	(month, day, year)
		4113	C	(IBI)				PHONE	NO.	War Co	EY METER USED
	*		**************************************	Name of Street or	HATTO COLORADO	AND PERSONAL PROPERTY OF	COLUMN TO SERVICE SERV		Name of the Constitution o	1601	WHIL
FENEZ	*					14		COM	PLIANCE	EITEMS	
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AR RESULTS	(in DPM)	(fill is		THE REAL PROPERTY.	REAL PROPERTY.	Na Constanting		2 (6 0)	FEDRINE	I Mars and	
C	mears 100 ci	n ²)	ther	uclid	e(3)	down	he		ments	- voidy c	meets require-
the table. All	2 3 4	-		-			7	(22)	Radiation	n levels	< 2.5 mR/hr
ION 1		0	6	7	8	9	10		< 100 d	THION (S	mears)
ION 1			T					(24)	allbratin	P PI	at .
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TION 1 DEL		>	+	+			-	1 (27)	Other (S	PECIFY I	
TION 1 PEL			1						Other (S	PECIFY I	perational railable IN REMARKS) METER 3

RADIATION	SAFET	Y SUR	VEY					BLDG	RF	1 4	MNQ.	mk
AUTHORIZED INVESTIGATOR	NAME (I	ast, first initia	d)			PHO	ONE	VO.	DATE		day, year	
SURYEYOR		ast, first initie	J)			PHO	ONE	NO.	V 14874	Y MET	ER USED	
×				14			COM	PLIANC	EITEMS		OMPLIAN	
FENE 24				75			YN					
26	RAU	J	\	TONEST					ns & lable		m	
		3		orr.		Ì			rigerator/			
* * *		2					7	(5) Was	ste contai er equipr			
	1	Appendix of the Control of the Contr						(7) Ab:			nradionu	clide
X				11				(8) Ad	equate he od air flox			
				4			OMPRINGENSIS	(10) A	dequate	personn	el extern	al
×							4	(11) R		stesw :	managem	
l e								(13) R	outine us	e of gla		rge
Y								(15) S	ouline us hielding,	if requi	red	
									and smok	ing	ng, drinki	ng,
								(18) 5	ventory! urvey rec	ords cu	irrent	
*							+	(20) P		on mo	uth pipett	
SMEAR RESULT	S (in DPN	fill in	the nucli	de(s) d	own th	e			omidor st nents	orage m	neets req	uire-
side of the table. A							7	rol 5	adiation I		2.5 mR/hr nears)	
OCATION 1	2 3	4 5	6 7	8	9	10		(24) C	< 100 dpn alibration	n current		
IUCLIDE 3 KIO								(26) 5	urvey me urvey me other (SP	eters av		RKS
NUCLIDE 2							MET	ESP TABLES AND ASSESSMENT OF	METE	INVESTIGATION OF THE PERSON	METER	3
				A			P.T. I Steel B	See F. S.	1111000			

ECOLO	GY	SL	RI	VIC	Œ	S,	I	VC	1.	MPA	MY NAME	FDI	7	
RADIATION	SAF	ETY	SUI	RVE	Y					BLDG	RE	ROO	M NO.	
AUTHORIZED INVESTIGATOR	1 /	(last, I	Nagrana	tial)	eri langua era es			Ph	HON	E NO.	DATE	(month,	day, year	r)
SURVEYOR	NAME	(last, 1	first inil	tial)				Ph	NOH	E NO.		Y METE	R USEC)
Auto- clave	CSA DANNY AVOC COMMON D		in C		Merch Colonia		511	JK	CC	MPLIANC	E ITEMS		OMPLIAN	
Clave		-	· · · · · · · · · · · · · · · · · · ·						Y	H				
45							7		H		ns & lable			
	Γ								H	(3) Ref (4) LS(rigerator/ C vials	freezer		
										(6) Oth	ste contai ier equipr	nent		
3					8				Z	PARTIES	sorbant pr se areas)	aper (or	nadionu	clide
					V		1	1		(9) Ho	equate ho	in calib	ration	
								1			dequate p monitoring	g		
							1		H		adioactive dequate r			
2								/			outine us			
						9	/	1		(16) Pr	hielding, rohibition	of eatin		ng,
					,					(17) In	and smoki ventory/	lacoqeit		
/		10				KLI	ELI			(19) P	urvey reciers onnel	train e d		
SMEAR RESULT	S(in DE	(N.4)	(fill in	the c	ALCO CONTRACTOR	ACTION ACTIONS		Section 1985		(21) C	rohibition orridor sto nents			
side of the table. A				ine n	uciid	e(a) d	own th	e	4	(22) R	adiation le			
LOCATION 1	2 3	4	5	6	7	8	9	10		<	ontaminati 100 dpm alibration		ears)	
NUCLIDE 1										(25) S	urvey met	ers ope		
P (1W)								>-			urvey met ther (SPI	ECIFY IN		(KS)
NUCLIDE 5									ME	ETER 1	METER	3 2 1	METER	3
												-		

LOOLO	GY S.R	TIOLO	,		DIDC	-	H-1	DH	net domain
RADIATION	SAFETY SU	IRVEY			BLDGP	RF	HOC	MNO.	and Secretary
AUTHORIZED INVESTIGATOR	NAME (last, first in			PHONE	NO.		month 30	, day, year)	
SURYEYOR	NAME (last, first in			PHONE	NO.	SURVEY	MET 44	ER USED	
				CON	MPLIANCE	ITEMS		OMPLIANO	
			2	YN					
DESK (OFFEE MUG		DES	X Z	(2) Sou	s & lable: rce contai igerator/f	ners		
1		4		7	(5) Was (6) Oth (7) Abs	te contair er equipm	ent	n radi on uc	lid
8				4	(8) Ade (9) Hoo (10) Ad	quate ho d air flow equate p nonitoring	in cal ersonr	bration nel externa	
		3		1	(12) Ad (13) Ro		dionu of gi		
9	SINK		2		(15) SH (16) Pr	ielding, i	frequ of eati ng	ired ng, drinkin	19
1001	oxio,	CA3, /	L50		(18) Su (19) Pe (20) Pr	invey reco ersonnel to ohibition	rds curained on mo	urrent	
MEAR RESULT		in the nuclide(s) down the		(22) Re	nents	vels «	2.5 mR/hr	
OCATION 1	2 3 4 5	6 7	8 9	10	(24) Ca	100 dpm alibration	curren		
IUCLIDE!			S	1	(26) SI	urvey met urvey met ther (SPE	ers av		ł K
NUCLIDE 2				ME	ETER 1	METER	NAME AND ADDRESS OF THE OWNER, WHEN	METER	and the same of
NUCLIDE 3						1			and the same

REMARKS: (Refer to item No. Include violations corrected by

RADIATIO	N	SA	FET	Υ	SUF	NE'	Y					В	LDG	BR	XF.		OM NO	cr.
AUTHORIZED INVESTIGATOR		NA	ME (I	ast, fi	rat initi	al)				PH	ON	IE N	Ю.		DATE (r	nonth	, day, year	
SURVEYOR		4 4	MEI		rat init	al)				PH	101	1E V	10.			1	ER USED)
		-th		(SUBSECTION)			Desiration of Business	AND POLICE SERVICE	MARINE PROCE		Ç	OMP	LIAN	CEI	TEMS		OMPLIAN	
	(0	1	Maringon Server								Y	N				Address of the State of State		
															& lables		m	
													(3) R	efrig	e contai erator/fi			
	5											П		ast e	contain			
	Te	2TK									L		(7) A	b3 or			on radion u	clide
cf	-	22													areas) uate ho	od flo	w	
	-														air flow quate p		ibration nel extern	lal
	F	212												mo	nitoring		managen	
3											E		(12)	Ade	quate ra	dionu	iclide ston	
													(14)	Rou	tine use tine use	of la	b coals	
												00,000		Pro		of eati	ng, drink	ing,
TO	- Z		ith	1										Inve		ізроза	al records	
back			-								L		(19)	Per	vey reco	rained		
	To the second se	MODERAL STATE	MEXICANO	Generalists	NAME OF TAXABLE PARTY.	STANCE SHAPE		阿尔拉斯斯 斯斯	SHEWARDWINS	Microsoft Services	1	1		Con	idor sto		outh pipet neets req	
SMEAR RESU						the	nuclid	e(3) d	own th	he			(22)		nts lation le	vels <	2.5 mR/h	r
side of the table	. All	1	ALCONOMIC STREET, STRE		-	Τ	Π			T		7	(23)		ntaminati 00 dpm	on (s	mears)	
OCATION	1	2	3	4	-5	6	7	8	9	10	F			Cali	bration o		t penational	
IUCLIDE 4	ru l				-			1		-		1	(26)	Sur	vey met	ers av		DVS
HUCLIDE 2											-	VET	Moreover	1	METER	SERVICE SERVICES	METER	HODORAGO
					1	1	1	1	i	1	9 1	T I have I	Sec. 1 3	3	ATT has I have	7 for	1 17 1 have 7 here! 3	-

RADIATION	SA	AFET	v st	JRVE	Υ	***************************************		974 T-100 T-		BLDG	75		OM MO	
AUTHORIZED INVESTIGATOR			ast, first i					PH	ONE	NO.	DATE (anderdonaders of	th Cer day, year	-
SURYEYOR	1.1	AME (I	ast, first i	nitial)				PH	ONE	NC.		YMET	ER USED)
Fu	GE	15H	ELF	SH	ELF	OPENSATIONNING	auschensta 'n	1	СОМ	PLIANC	EITEMS		OMPLIAN	
EST (3	2			4	1	5	EA		Y N					
N The state of the	d model rollamente						d	described			ns & lable		m	
						- 1					rigerator/			
										(5) Was	ste contai			
										(7) Abs	170		n radion u	clide
											se areas) equate ho	od flor	W	
										(9) Ho	od air flow	in cal		al
											m onit orin	g	managem	
										(12) A	dequate r	adionu	clide store	
										(14) R	outine us outine us	e of la	b coals	
											hielding, rohibition		ired ng, drinki	ng,
											and smok ventory/		al records	
									H	(18) S	urvey rec ersonnel	ords cu	urrent	
										7(20) P	rohibition	on mo	outh pipeti neets req	
SMEAR RESUL	TS (in	DPM) (fill	in the	nuclid	e(a) d	own th	e		r	nents			
side of the table.	All sme	ars 10	0 cm ²)			pa nadionina inches	ge- 200000000000p		1	end y	adiation li ontaminal		2.5 mR/hr mears)	
OCATION 1	2	3	4 5	6	7	8	9	10			100 dpm alibration			
NUCLIDE										and the same of th	urvey me			
NUCLIDE 2					-								IN REMA	RKS
								CONTRACT V CONTRACT	ME	TER 1	METE	R 2	METER	3
NUCTIDE 3	1												Mark No.	

ECO	LO	G	Y	S	RV		CE	S,	IV	IC.		W MPA	MAN YN	FI	AC	
RADIAT	ION	SA	AFET	Υ	SUR	VE	Υ					BLDQ	3RF	gir strong.	DM NO St Cov	Υ,
AUTHORIZ INVESTIGAT		NA	AME (last, fi	rat initi	al)				PHO	ONE	NO.		(month	, day, year	-
SURVEYO	R	1	1	last, fi	irst initi	al)				PHO	ONE	NO.	A CONTRACTOR	W/ L	ER USED	
	alicense and allowers	era lessa el ask	TO THE PROPERTY OF THE PARTY OF		at design the disease	des esperant	N	orth		Newson Care of the	COM	IPLIANC	E ITEMS		COMPLIAN	
						heir	00	orr.			YN					
									2 For	×23		(2) Soil (3) Ref (4) LSO (5) Wa (6) Oth (7) Ab: u (8) Ad (9) Ho (10) A	ste conta ner equipi sorbant p se areas) equate h od air flow dequate monitorin adioactive	ainers freeze iners ment aper (ood flo w in cal person g waste	on radion w W ibration nel extern managem	al ent
			us frankrijs veni		ON CONCUSSION CONT		BRADING CHRISTAN	South 2007	N. (0.00 To 40 To			(13) R (14) R (15) S (16) P (17) Ir (18) S (19) P (20) P (21) C	outine us hielding, rohibition and smok aventory? furvey recovers onnel condor st	ie of gl ie of la if requ of eati ting dispose ords cords cords on mo	b coats ired ng, drinki al records urrent	ng, ing
SMEAR RE						ther	nuclid	e(3) d	own th	е		(22) F	ments Radiation I Contamina		2.5 mR/hr mears)	
LOCATION	1	2	3	4	5	6	7	8	9	10		(24) C	< 100 dpr Calibration	n curren	t	
NUCLIDE	Kla	sekvise										[26] 5	Survey me Survey me Other (SP	eters av		RKSI
NUCLIDE 2											ME	TER 1	METE	WARD OF THE PERSON NAMED IN	METER	3
NUCLIDE 3																

RADIATION	SAF	FTY	SUP	RVE	Y				BL	DG	70		DM NO PA	VY.
AUTHORIZED INVESTIGATOR		E (last, fi		and the contract of the	***************************************			PH	ONE NO).		$\frac{3\alpha}{36}$, day, year	
SURYEYOR		E (last, f	irat initi	ial)				PH	ONE NO),	SURVE L3 w	Y MET	ER USED	S-800 NOT-12
				SALDHARIC BLACKER		400 C 2000			COMPL	IANCE	ITEMS		COMPLIAN	
								en and a second	YN) Sign	з & lable	9 700	m	
									(2) Sour) Refri	ce conta gerator/1	iners		
									(5	*	Mais le contair er equipm			
										uз	e areas)		on radion u	clide
									(5	9) Hoo 10) Ad		in cal ersoni		al
							1			11) Ra		waste	managem Iclide store	
WEST CON.	(2	(357		4	EAST	corr.		13) Ro 14) Ro	utine use	e of gl	oves b coals	
	FZR FZR	INCU	FZR	FZR	FZ	R	13C	LSC		16) Pro	ielding , i ohibition nd smoki	of eati	irea ng, drinkii	ng,
										18) Su	entory / c rvey reco	ords c		
		ender dieser einsen ein	10000000000000000000000000000000000000	Removement	orski oktob	AURIGIUM ION	SECTION AND ADDRESS OF	Oliniconstante		20) Pro 21) Co	ohibition midor sto	on mo	outh pipett neets requ	
SMEAR RESULTS side of the table. All				ther	nuclid	e(a) d	own th	e	Bearing confidences and the Confederation of the Co	22) Ra	ents diation le intaminat		2.5 mR/hr	
	2 3	3 4	5	6	7	8	9	10		24) Ca	100 dpm libration	curren		
OCATION 1														
OCATION 1			>							26) Su	irvey mel irvey mel her (SPI	ers av		RKS

ECOI	O	G	7 5	5.4	PV.	IC.	ES	5,	IN	C		A P	A YMA	IAME 1-	10-	7	
RADIATIO	ОИ	SA	FET	Υ	SUR	/EY						BLDG	VM		ROC	M NO. 105	
AUTHORIZED INVESTIGATO		N.A	1		st initial					PH	ONE	NO.	DA	G-3		day year	r)
SURYEYOR			the second section is a second	last, fir	rst initial					PH	ONE	NO.	SU	3wl	MET 44	ER USEC	
	MINISTERNA S	CONSUMPRISON	agazeni firetzen kins	catement medical	ilita oli tetika ili		\$1600,000			ensummer (CON	MPLIAN	ICE ITE	EMS		OMPLIAN	
		11	scu	~ I							Y						
											1	(2) 5	igns & ource	contain	ers		
			2	ad.							1	(4) L	Reiniger SC via Vaste c	13			
											7	(6)	Other e Absorbs	quipme ent pap	ent -	n radion u	ıclide
								1			4		use ar Adequa Hood ai	te hoo			
0-0									/		7	(10)	Adequ	iale pe toring	rs on r	nel extern	
KEK						3	3	1	/	1	1	(12)		late rac	tionu	managen clide stor	
				-			L		4		1	(14)	Routin Shield	ing, if	of lat	coats red	
)										and:	am okin	g	ng, drink I records	
											1	(18)	Surve Perso	y recor nnel tr	ds cu ained	irrent	
SMEAR RES	SULT	S(in	DPN	1)	(fill in t	ne nu	cli d e	(a) d	own th	esamon	1			or ston		uth pipet neets req	
side of the tat								(0) 0			4	present 5 f	Conta	minatio		2.5 mR/h nears)	r
LOCATION	1	2	3	4	5	6	7	8	9	10	4		Calibra			erational	
	100				>						7	(26)	Surve	y mete	73 8.V		RKS)
-	(100)			,	>						МЕ	ETER	вомножинарыли	ETER	SALANTA ENVIRON	METER	A SPERMINENS AND A SPERMINE
NUCLIDE 3																	

REMARKS: (Refer to item No. . Include violations corrected by supervisor.)

RADIATION	SA	FETY	' SU	RVI	EY					BLDG	BX		6448	2
AUTHORIZED INVESTIGATOR	NA	ME (las	t, first in	itial)				F	PHON	IE NO.	DATE (modern measure	h, day, yes	make and the said
SURVEYOR		ME (las	it, first in	itial)				F	PHOP	IE NO.			TER USED	
	Marian Mar Marian	DANIDONN SPECSTO		A STATE OF THE STA	ALONG ARCHITECT		AUTHOR AUTO	een in minimum	C	OMPLIANC	EITEMS		COMPLIA VIOLATIO	
FUGE		5				1	-27	< .	Y	H				
DESK			2					5C		(2) Sou (3) Refr (4) LSC (5) Was (6) Oth (7) Abs us (8) Ade (9) Hoo (10) Ad (11) Ra (12) Ad (13) Ro (14) Ro (15) Sh (16) Pr (17) Inv (18) Su (19) Pe	te contair er equipm orbant pa e areas) quate hou d air flow equate pr nonitoring dioactive equate ra utine use ielding, if ohibition of nod smokir rentory / di rvey recor rsonnel tr	ners reeze ners ners ners ners ners ners ners ner	on radionus w dibration nnel extern e managen uclide ston loves ab coats uired ing, drinki al records urrent	nent nent age
MEAR RESULT				the	nuclid	e(3) d	own t	he		(22) Ra	ents	els «	meets req : 2.5 mR/hr mears)	
OCATION 1	2	3 4	5	6	7	8	9	10		(24) Ca	100 dpm libration c			
IUCLIDE TO KILL			->						-	[26] Su	rvey mete rvey mete her (SPE	rs av		RKS
	NUMBER OF STREET	-		-	1	1	-	-	-	(61)	usi (or P.	VII I	31.5 1 1 Sec [Y 17" W	111

REMARKS: (Refer to item No. . Include violations corrected by supervisor.)

RADIATION	SAFETY SU	RVEY			BLDG	B8		OM NO.	
AUTHORIZED INVESTIGATOR	NAME (last, first in	itial)		PHON	IE NO.	DATE	enth en enteres carette	day, year)
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REMARKS: (Refer to item No. . Include violations corrected by supervisor.)

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REMARKS: (Refer to item No. Include violations corrected by supervisor.)

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REMARKS: (Refer to item No. Include violations corrected by supervisor.)

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Rev. Oct 1990

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REMARKS: (Refer to item No. Include violations corrected by supervisor.)

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ATTACHMENT 3

DELEGATION OF AUTHORITY DOCUMENTS

I. INTRODUCTION

Incumbent serves in the top management hierarchy of the Agency as the official responsible for continuous surveillance and action to assure that FDA activities are conducted in accordance with sound management principles and practices and adhere to applicable laws and regulations. Incumbent provides the executive managerial leadership and direction essential for the effective functioning of the FDA. Agency programs' impact heavily upon the economy of the Nation and the American public. Its regulatory activities directly impact on 38 cents of every consumer dollar, totaling in excess of \$250 billion, over one-fourth of our gross national product. To accomplish its mission responsibilities, FDA is organizationally comprised of major bureaus at the headquarters level and field offices and resident stations strategically located throughout the United States, and is staffed predominently by scientific and professional personnel conducting applied research and engaged in highly specialized functions in the medical, biological, physical, and engineering sciences.

II. DUTIES

- 1. Interprets policies and identifies requirements imposed upon the Food and Drug Administration by the Office of the Assistant Secretary for Health, the Department, and higher authorities. Assays and identifies Agency requirements in terms of funds, manpower, equipment, and facilities necessary for the functioning of the FDA. Formulates and recommends to the Commissioner administrative managerial policies and plans for the implementation of and surveillance over management programs, systems, and services necessary to assure the optimum effectiveness of the utilization of the Agency's resources. Maintains liaison with Agency manpower planners for budgetary purposes.
- 2. In the capacity of consultant and advisor, participates fully in program planning with the Commissioner, Deputy Commissioner, Associate Commissioners, and Bureau Directors to assure that program plans take into account the resources (men, money, and materials) required, the availability of resources, and the utilization of these resources in support of Agency plans and programs. Revises management policies and resources allocations as necessary to cope with program changes; and/or makes recommendations to the Commissioner for shifts of emphasis on substantive programs in view of resources considerations.
- 3. Provides executive leadership and direction on the development, operation and appraisal of managerial programs and systems and supportive administrative services for the entire Agency, to include provision for: management and control of FDA financial and budgetary affairs, personnel administration, safety program management, internal security, organization and methods analysis, facilities planning and building services, procurement and supply management, contracts administration and monitoring, grants administration, management of automated data processing systems, directives issuances and other paperwork management services, communications, printing, and other administrative services, records management, management information systems, Committee Management functions (coordinates all FDA committee management activities), Hearing

Clerk functions (maintains hearing records for Agency rule making activities). Mational Technical Information Services activities (coordinates submission of FDA technical reports to MTIS, D/Commerce). Directs, coordinates, and supervises all of these administrative managerial staff activities through subordinate Division Directors, reviewing their plans and policy proposals, and discussing ways and means of resolving problems encountered in these various substantive areas. Similarly, advises and assists Bureau and substantive program officials on the organization and management of on-going and new operations and activities, and responds to provide effective managerial services and administrative support in consideration of the precedence and priority of their needs.

4. Represents or accompanies the Commissioner in conferences and at meetings, concerning administrative management and related matters, at the Departmental level, with representatives of outside departments and agencies (e.g., the Office of Management and Budget, General Accounting Office, General Services Administration, and the Office of Personnel Management), and with Appropriation Committees of the Congress. Actively participates with the Commissioner in the presentation and justification of the FDA budget, as necessary, at higher levels.

III. SUPERVISION RECEIVED

Works under the general direction of the Commissioner and Deputy Commissioner of Food and Drugs who provide guidance on the overall policies of the Food and Drug Administration. The incumbent is relied upon to independently plan, develop, and implement progressive management plans and policies. He generates project assignments and directs others in studying and analyzing the functions and organization of the Agency. Takes action to effect management improvements and to resolve problems encountered. The incumbent is authorized to speak for and commit the Commissioner and the FDA on administrative management matters.

IV. EEO RESPONSIBILITY

Incumbent is responsible for furthering equal employment opportunity by demonstrating fairness in making selections, encouragement and recognition of employee achievements, fair treatment of minority group employees, and sensitivity to the developmental needs of all employees, including minority groups, women and the handicapped.

January 3, 1994 NOTE TO: James McKenna SUBJECT: Decommissioning Funds Authority Because I am FDA's delegations officer, Jeanne Metz asked me to reply to your 12/30/93 fax on the above subject. The Commissioner was given financial management authorities, which includes the authority to give financial assurance for decommissioning, by the Assistant Secretary, Comptroller, HEW, in 1970 (see attached FR notice). When HEW became HHS, the authorities were carried over. In 1980, the Commissioner redelegated all his financial management authorities, which includes the authority to give financial assurance for decommissioning, to the ACM (see attached 5MG). This authority still resides with the ACM. If you have any further questions, please let me know. My fax number is (301) 443-8811. My phone number is (301) 443-4976. Thanks. Ellen Rawlings Delegations Officer

STAFF MANUAL GUIDE

ORGANIZATION AND DELEGATIONS MANUAL

GUIDE

FDA 1405.3

DELEGATIONS OF AUTHORITY - GENERAL AGENCY

DELEGATION OF ADMINISTRATIVE AND FINANCIAL MANAGEMENT

AUTHORITY TO THE ASSOCIATE COMMISSIONER FOR MANACEMENT AND OPERATIONS

- 1. Purpose
- 2. Delegation
- 3. Redelegation
- 4. Effect on Previous Delegations or Redelegations of Authority
- 5. Supersession of Previous Authorities
- 6. Effective Date
- 1. PURPOSE. The purpose of this Guide is to redelegate to the Associate Commissioner for Management and Operations the administrative management and financial management authorities vested in the Commissioner of Food and Drugs.
- 2. DELEGATION. The Commissioner of Food and Drugs hereby redelegates to the Associate Commissioner for Management and Operations all administrative and financial management authorities delegated to him by the Assistant Secretary for Health and/or other officials of the Department or the Public Health Service, where redelegation is not prohibited in the delegation document, including authorities delegated or amended subsequent to the PMS reorganization of July 1, 1973.
- 3. REDELEGATION. The authorities may be redelegated within the restrictions specified within the delegation document, pertinent Department Manual instructions, or other issuances.
- 4. EFFECT ON PREVIOUS DELEGATIONS OR REDELEGATIONS OF AUTHORITY.

 Fending issuance of redelegations, all delegations or redelegations of these authorities to any other officer or employee of any office, institute, bureau, division, center or other organizational unit which were in effect immediately prior to this delegation, shall continue in effect in them or their successors.
- 5. SUPERSESSION OF PREVIOUS AUTHORITIES. The previous delegation of these authorities contained in Guide FDA 1405.3, (GT 78-19, 6/7/78) is supersuded.

6. EFFECTIVE DATE. July 29, 1980.

Commissioner of Food and Drugs

GT NO. 80-88 (7/31/80)

PAGE 1

sanitation, shelifish sanitation, and polson control.

4. Panetions under Executive Order 11001, section 1(f), and those portions of sestions 3(b), 3(d), 3(e), 6, 7, 3, and 12 which relate to food, drugs, and blologicals. In the performance of these emergency functions the Commissioner xhall coordinate his activities with the Administrator. Health Services and Mental Health Administration in order that preomergency plans shall be developed in consonance with poststack orcontrational plans and structure of the Department for the Emergency Health Service.

5. Function of Laulag all regulations of the Pood and Drug Administration, The reservation of authority contained in Chapter 2-000 of the Department Orgaruzation Manual shall hot apply.

6. Punction of authorizing and ap-

proving miscellaneous and emergency expenses of enforcement activities, vosced in the Berrylary.

These authorities may be redelogated. Pending issuance of redelegations, all delegations or redelegations to any other officer or en:ployee of any office. institote, boreau, division, center, or other organization unit which were in effect immediately prior to the effective date of this redolegation shall continue in effect in them or their successors.

This redelegation becomes effective February 1, 1970.

Dated: December 19, 1969

ROCER O. ECREEC

Assistant Secretary for Health and Scientific Alairs.

[F.R. Doc. 70-507; Filed. Jan. 15, 1070; 6:45 8.TO.

COMMISSIONER OF FOOD AND DRUGS

Redelegation by the Assistant Secretary for Administration

I horses delugate to the Commissioner of rood and Drugs all the administrative management authorities currently delegated an a common basis to heads of operating areneics within the Depart-ment of Heulth, Education, and Welfare,

These authorities may be redelegated within the restrictions specified in perliment Department manual instruc-

Proding impance of redelegations, all delegations of redelegations to any other officer or employee of any office, institute. burrau. division, center, or other organizational unit which were in effect immediately prior to the effective date of this redeligation shall continue in effort in thera or their successors.

This redeleration becomes efficulte February 1, 1910.

Dated: December 23, 1969.

SOL ELEON, Acting Deputy Assistant Smeretary for Administration.

[F.R. Doc. 90-888; Filed. Jun. 15, 1970; [F.N. Doc. 70-577; Filed. Jan. 18. 1970;

COMMISSIONER OF FOOD AND DRUGS

Redelegation by the Assistant Socrotary, Compiler

I hereby delegate to the Cammissioner of Food and Drugs all the financial management authorities currently delbgated on a common batis to heads of operating agencies within the Department of Health, Education, and Welfure.

Those suthorities many be redriesored within the restrictions specified in pertinent Department manual inscruc-

tions or other usuances.

Pending impance of redelegations, all delegations or redelegations to any other officer or eniployee of any office, institute. bureau, division, center or other organientional unit which were in check inte mediately prior to the effective date of this redelegation shall continue in effect In them or their successors.

This redelegation becomes effective February 1. 1870.

Dated: December 24, 1969.

JAMES F. KELLY. Assistant Secretary, Comptroller. [P.H. Doc. 70-889; Piled. Jan. 15, 1970; Jist s.m.]

ATOMIC ENERGY COMMISSION

(Dockes No. PRM-30-46)

MINNESOTA MINING AND MANUFACTURING/CO.

Notice of Proposed Rule Moking

Notice is hereby given that the Minnesole alliums and Manuacturing Co., General Odices, JM Center, St. Paul. Minn, by letter dated December 29, 1969. has flied with the Commission a petition for rule making to amend the Cominission's regulations. "General Licenses for Certain Quantities of Byproduct Material and Byproduct Material Contained in Certain Items," 10 CFR Part 31, and "Specific Licenson/to Manufacture, Distribute, or Import Exempted and Generally Licensed Items Containing By-product Material," 10 CFR Part 12.

The petitioner requests that the Cornmission amend \$ 31.7(g) of Part 31 and \$ 33.53(e) of Part 32, which pertain to luminous safety devices for the in aircraft to increase the maximum quantity of promethium-147 specified for lyiningus sulety devices from 200 milliouries to 500 mulicuries per device.

A copy of the petition for rule making is available for public inspection in the Commission : Public Document Room as 1717 H Street NIV. Washington, D.C.

Dated at Germantown, Md., this orn day of January 1970.

For the Atomic Energy Commission.

W. B. McCool.

8:45 m.m. |

CIVIL AERONAUTICS BOARD

|Docket 204711

BOSTON-BUFFALO-CLEVELAND SUDPART M CASE

Notice of Orol Argument

Notice is hereby given, pursuant to the provisions of the Federal Awation Act of 1958, as amended, that oral argumen in the above-entitled case is assigned to ce held on January 23, 1970, at 10 am. e.s.t., in Room 1027, Universal Building 1825 Connecticut Avenue NW., Washing un. D.C., before the Board.

Doind at Washington, D.C. Janu Ery 12, 1870.

INEAL?

THOMAS L. WARRY Chief Ezeminer.

(P.R. Dun. 70-568; Pilod. Jab. 15, 1970 8:45 a.m.1 . E.

Docket 209381

2:45 MINIMUM CHARGES PER SHIPMENT OF AIR FREIGHT

Notice of Hearing

- appe Notice is hereby siven pursuant to the provisions of the Federal Aviation Act of 1968, as amended that a hearing in the above-entitled proceeding will be held on February 3, 1070, at 10 (e.s.t.), in Room 911, Universal Building. 1825 Commettent Avenue NW. Washington. D.C., before the undersigned Examplear.

For information concerning the listen involved and other details in this proeceding, interested persons are referred to the preheuring conference report served on July 11, 1960, and other documents which are in the docker of this proceeding on file in the Docket Section of the Civil Acronautics Board.

Dated at Washington, D.C., Janu-

(LIZEL

THOMAS P. SHEETAN. Hearing Beaminer.

(FR. Doc. 70-669; Piled. Jan. 15, 1973; 8:45 4.M. J

FEDERAL COMMUNICATIONS COMMISSION

[Docket No. 10780; PCC 70-72] LEISNER BROADCASTING CO.

Momerandum Opinion and Order Designating Application for Hearing on Stated Issues

In regard application of Leisner Broadcasting Curporation (TVINU). Thurmont Md., has: 1450 kc., 100 v. U. Clase TV. requests: 1450 kc. 250 w. 500w.-LS. U. Clase TV. for construction permit. Docket No. 18780, Frie No. BP-

I. The Commission has before it for consideration (a) the above-captioned

TELEPHONE CONVERSA ON LOG Jary 13, 1994 PERSON CALLED: ORGANIZATION: TELEPHONE NUMBER Dr. Chawla, Safety Director FDA Licensee Dore Watik, SIFSAN Safety HHS Called Officer Don Thompson, FDA Safety Officer Jim Mckenna, Division Director LICENSE NUMBER DOCKET NUMBER: MAIL CONTROL NUMBER: 08-00482-03 030-03917 116499 PERSON CALLING: David B. Everhart (215) 337-6936 USNRC Region I FAX Numbers 475 Allendale Road (215) 337-5269 or King of Prussia, PA 19406 (215) 337-5234 SUBJECT: Submission of amended DFP in BRF site RAM work. Stated that the amended DFP would be submitted by Fed Ex by 1/14/94. The licensee expressed concern over the possibility that work was performed at the BRF site prior to this site being listed as an authorized location on the license. This occurred in the late sixties or early seventies. fact was uncovered by the contractor developing the DFP during preparation for the submission of the DFP. I stated that the licensee must review the facts, ascertain the degree of contamination present, if any, now and develop a plan for remediating the situation. The licensee stated that they would prepare a report with all the pertinent facts regarding this situation. I stated that i would speak to my management about this however this probably was not of dire concern at this time. ACTION REQUIRED/TAKEN: CC: M. Shanbaky B. Ullrich SKINATUR) 1.18-94

ACTION REQUIRED/TAKEN

SIGNATURE

DATE:



Food and Drug Administration Washington DC 20204

December 6, 1993

030 - 03917

United States Nuclear Regulatory Commission Region I 475 Allendale Road King of Prussia, Pennsylvania 19406-1415

Attn: Mohammed M. Shanbaky Chief, Research and Development Section Division of Radiation Safety and Safeguards

License No. 08-00482-03 Docket No. 030-03917 Control No. 116499

As per a recent telephone conversation with Mr. David Everhart of your staff, the Food and Drug Administration (FDA) Center for Food Safety and Applied Nutrition (CFSAN) would like to request an extension for up to a period of 90 days i.e. until March 1, 1994 to submit information concerning your correspondence dated November 2, 1993.

The reason for the 90 day extension is to retain the original contractor Kervic Inc. to assist us in preparing a reply in modifying the documents submitted to your office on November 16, 1993.

Should there be any questions concerning this matter, please contact me at (202) 205-4281.

Sincerely

Michael S. Terpilak

Certified Health Physicist

cc: David Everhart

NOV 02 1993

License No. 08-00482-03 Docket No. 030-03917 Control No. 116499

Department of Health and
Human Services
Public Health Service
U.S. Food and Drug Administration
ATTN: Michael S. Terpilak, C.H.P.
Safety Office
Mail Code HFF-14
Room 6113
200 "C" Street, SouthWest
Washington, D.C. 20204

Dear Mr. Terpilak:

Subject: Financial Assurance

This is in reference to your letter dated November 16, 1992 with the attached Letter of Intent and Decommissioning Funding Plan (DFP) to provide financial assurance for License No. 08-00482-03. We have reviewed your submittal and request that you modify the appropriate documents to address the specific matters described below:

- 1. Table 2, "Acceptable Surface Contamination Levels" of your submittal states that the limit for removable contamination for natural thorium and other isotopes in that group is 1000 dpm/100 cm². You state that the source for this table is the NRC Regulatory Guide 1.86, Table 1, 1974. The contamination limit for these isotopes listed in Regulatory Guide 1.86 is 200 dpm/100 cm². Please confirm that you will use a removable contamination limit of 200 dpm/100 cm² for natural thorium and other isotopes in that group.
- 2. Page 2-21 of your submittal states that "before the early 1970's, radioactive liquid wastes were disposed of into the Beltsville Research Facility, (BRF) septic system." You also state that you will take soil samples (just prior to commencing decommissioning of the facility) to determine how much, if any, radioactive material is in the soil. Please review the disposal records for this time period to determine if the material released was in accordance with 10 CFR Part 20. If so, you need not include this material in your DFP. If this determination cannot be made with certainty, you must evaluate the amount and

extent of contamination and propose what steps will be taken to remediate the situation at this time.

- 3. Page 2-21 further states that waste material was reportedly buried on the BRF Site in the early 1970's. This must be fully evaluated to determine the validity of this claim. If this is true, the nature and extent of the contamination must be evaluated. If the material was buried and was not in accordance with 10 CFR Part 20 regulations at the time of burial, you must propose the steps which will be taken to remediate the situation at this time.
- 4. Regulatory Guide 3.66 (enclosed) recommends that a contingency factor be included in the decommissioning cost estimate. You inferred a contingency factor of \$250,000 (21%) by including \$150,000 for the HVAC system in Federal Building 8 and \$100,000 for the remediation of the BRF site. Incorporating a contingency factor in the cost estimate helps ensure that you are prepared for <u>unexpected</u> circumstances that could raise decommissioning costs. The more conservative approach is to include all possible <u>known</u> costs and incorporate a contingency factor for truly unexpected costs. NUREG/CR-1754 <u>Technology, Safety and Costs of Decommissioning Reference Non-Fuel-Cycle Nuclear Facilities</u>, and NUREG/CR-1754, Addendum 1 (enclosed), use a contingency factor of 25 percent in the cost estimates for each of six reference laboratories. Incorporate a contingency factor of 25 percent into the decommissioning cost estimate or you may choose to use a lower contingency factor if you can show why a lower factor is appropriate.
- You have submitted cost estimates for decommissioning which appear to be adequate, however, it is difficult to be certain without knowing the average and maximum amount of radioactive material used in each location as well as the average radioactive contamination found in areas such as fume hoods, glove boxes, floors and laboratory benches. Please supply this information to enable us to compare your estimates with those found in NUREG/CR-1754 and NUREG/CR-1754, Addendum 1.
- Please submit documentary evidence that the parties signing the letter of intent are authorized to represent the Department of Health and Human Services in the transaction.

We will continue our review upon receipt of this information. Please reply in <u>duplicate</u> to my attention at the Region I office and refer to Mail Control No. 116499. If you have any questions regarding this letter please call David Everhart at (215) 337-6936.

Since your license requires financial assurance, we request that you submit your response to this letter within 30 calendar days from the date of this letter.

Sincerely,

Original Signed By: Elizabeth Ullrica

for

Mohamed M. Shanbaky, Chief Research and Development Section Division of Radiation Safety and Safeguards

Enclosures:

- 1. Regulatory Guide 3.66
- 2. NUREG/CR-1754
- 3. NUREG/CR-1754, Addendum 1

DRSS:RI DASS:RI Everhart Shinbaky

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Food and Drug Administration Washington DC 20204 November 16, 1992

030-03917

Licensing Assistant Section Nuclear Materials Safety Branch U.S. Nuclear Regulatory Commission, Region 1 475 Allendale Road King of Prussia, PA 19406-1415

Dear Sir:

The Food and Drug Administration, Center for Food Safety and Applied Nutrition (FDA, CFSAN) would like to submit a renewal application for our Broad Scope Materials License number 08-00482-03 which expires on December 31, 1992.

In addition, also enclosed is the Decommissioning Funding Plan (DFP) and a letter of intent certifying Financial Assurance for these identified funds, which will be utilized to decommission and decontaminate these facilities.

I trust this letter and enclosures will be sufficient for review by the appropriate technical Nuclear Regulatory Commission staff, and will await the results of their evaluation of this license request. Since we are a Federal Agency, we are exempt from the license fees for the application for a Material License. However, we are still subject to the annual users fees as required under the Omnibus Budget Reconciliation Act of 1990.

I would appreciate the transmittal of all correspondence relative to the licensing of these facilities directly to Mr. Michael S. Terpilak, Staff Health Physicist for the Center for Food Safety and Applied Nutrition (CFSAN) Safety Management Branch (SMB).

Please communicate directly with him at the following address:

Michael S. Terpilak, Certified Health Physicist U.S. Food and Drug Administration Safety Office, Mail Code HFF-14 Room 6113 200 "C" Street, S.W. Washington, DC 20204

(202) 205-4281

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Parje 2 Thank you in advance for your utmost cooperation and attention in this matter. Sincerely yours, Ray Z. Russ Ray L. Russo, Ph.D. Acting Director Office of Management Systems cc: S. Holston V. Whitley N. Chawla D. Demers J. McKenna D. Riley A. Borsetti S. Green R. Frobisch D. Waddick M. Terpilak RSC E. Radden B. Bradley C. Greishaber





Food and Drug Administration Rockville MD 20857

NOV - 1-6-1992

Thomas Martin Region I Administrator U.S. Nuclear Regulatory Commission 475 Allendale Road King of Prussia, PA 19406

Dear Mr. Martin:

The Food and Drug Administration's (FDA) Center for Food Safety and Applied Nutrition (CFSAN) currently holds a Nuclear Regulatory Commission (NRC) license (License Number 08-00482-03 as amended through amendment 46) to operate the following facilities:

Federal Building 8 located at 200 C Street, S.W., Washington, DC

Center for Veterinary Medicine (CVM) located at the Beltsville Agriculture Research Center, Beltsville, MD

Module One located at the Beltsville Research Complex, Beltsville, MD

Beltsville Research Facility located at the Beltsville Research Complex, Beltsville, MD.

As previously directed by the NRC the FDA sent a letter of intent to the NRC Region I Administrator (S.S. Holston to W.T. Russell July 18, 1990) obligating \$750,000 in funds from the FDA subject to availability of appropriation, toward the eventual decommissioning cost of the above listed facilities. Consistent with that letter and pertinent Federal regulations, the FDA committed to the preparation of a Decommissioning Funding Plan (DFP) to be submitted with CFSAN's next license renewal application.

Enclosed is a license renewal application for CFSAN, complete with a copy of the DFP prepared for the applicable facilities.

In accordance with the applicable Federal regulations and with the authority vested in me to obligate FDA funds, I am submitting this letter of intent to serve as certification of financial assurance for funds in an amount at least equal to \$1,169,900, subject to availability of appropriations, toward the decommissioning of the above facilities at such time when it is required.

Sincerely yours,

Sharon Smith Holston

Associate Commissioner

for Management

Food and Drug Administration

Enclosure

Decommissioning Funding Plan and Preliminary Decommissioning Plan for Food and Drug Administration Facilities

Contract Number: 223-92-2005

Submitted to:

Department of Health and Human Services Food and Drug Administration Rockville, MD 20857

Submitted by:

The KEVRIC Company, Inc.
Silver Spring Metro Plaza One
8401 Colesville Road, Suite 610
Silver Spring, MD 20910
(301) 588-6000 Fax: (301) 588-1777

October 30, 1992

In accordance with the requirements of Department of Health and Human Services contract number 223-92-2005, The KEVRIC Company has prepared this document. The document contains the contract deliverables as identified in Thomas H. Vango's June 17, 1992 letter to Ms. Sandra A. Allen, ASA. The deliverables and their location in the document are:

- Part A The Decommissioning Funding Plan
- Part B The Preliminary Decommissioning Plan
- Part C The decision document on whether an EIS/EA needs to be conducted
- Part D Survey results of the HVAC system and laboratory hoods, the dedicated low-level radioactive liquid waste disposal sink, and the incinerator facilities
- Part E All other survey results

Executive Summary

Executive Summary

The Food and Drug Administration (FDA) currently operates four facilities under a Nuclear Regulatory Commission (NRC) license that will expire on December 31, 1992. The currently held NRC license (License Number 08-00482-03, as amended through amendment 46) covers the operations of the following four facilities:

- Federal Building 8 (FB-8) located at 200 C Street, N.W., Washington, DC;
- Center for Veterinary Medicine (CVM) located at the Beltsville Research Complex, Beltsville, MD;
- Module One Facility (MOD-1) located at the Beltsville Research Complex, Beltsville, MD; and
- Beltsville Research Facility (BRF) located at the Beltsville Research Complex, Beltsville, MD.

To maintain this license, the FDA must submit a license renewal application to the NRC before December 1, 1992. In accordance with recent changes (53FR24018) in the NRC regulations, a Decommissioning Funding Plan (DFP) must be submitted with the license renewal application and adequate funds committed to complete the decommissioning.

A DFP consisting of a cost estimate was prepared (Part A of this document). The DFP was based on the assumption that the missions of the four facilities will not significantly change before their decommissioning. A separate decommissioning cost estimate was prepared for each FDA facility, since the decommissioning dates of the four facilities are uncertain and most probably will not coincide.

The DFP's total decommissioning cost estimate, in current dollars, for the FDA facilities is \$1,169,900. The individual estimates, by facility, in the DFP are as follows:

FB - \$591,600
 MOD-1 - \$152,500
 CVM - \$76,600
 BRF - \$349,200

NRC regulations (as documented in 10 CFR 30.35.f.4) state that, in the case of the Federal Government licensees, a statement of intent containing a cost estimate is an acceptable form of funding commitment. The current FDA Commitment for the decommissioning activities of these facilities is \$750,000.00. For renewal of the current license, the FDA must submit the DFP and a letter of intent with the increased commitment amount.

A Preliminary Decommissioning Plan (PDP) was developed (Part B of this document) which identified significant work items and problem areas for the DFP cost estimates. Although the PDP was generated following the decommissioning plan guidance written by NRC, it was developed only to provide a basis for preparing the DFP. Once the FDA has determined the sequence of decommissioning its facilities, some parts of the PDP, such as scheduling, decommissioning organization, and specific contractor assistance, will need to be developed for the complete PDP.

Walk-through inspections of the FDA facilities were conducted in July and August 1992 by FDA personnel and The KEVRIC Company, Inc. personnel to assess the existing facilities and equipment conditions. To better understand past and anticipated future operations of the facilities, historical laboratory records were reviewed, and selected laboratory personnel were interviewed. In addition, in assessing the facilities' present radioactivity conditions, Ecology Services, Inc. (ESI) conducted meter surveys of selected areas of the facilities on August 3-6, 1992 (Part D of this document).

Over the years, many changes have taken place in the FB-8 facility. A detailed radiological survey of the facility areas currently identified as using radioactive materials will be conducted in conjunction with the decontamination activities. In addition, offices and laboratories not identified as using radioactive material will have door handles and entry floor areas checked by swipes for contamination.

Chemical and biohazard contamination and waste removal must be considered in decommissioning safety work procedures of the laboratories. A number of hazardous, nonradioactive materials such as dioxin, kepone, and carcinogens have been used by the laboratories.

Provisions need to be made to dispose of low-level radioactive waste generated at FB-8. From a decommissioning costing perspective, it is assumed that an acceptable waste repository will be available by the decommissioning date. However, because the District of Columbia is not a member of a low-level waste compact, on January 1, 1993 the FB-8 low-level radioactive wastes cannot be shipped from the building and thus must be stored on site.

The new MOD-1 facility has rigid radioactive contamination prevention controls. Thus, the decontamination activities will be limited to the areas now identified as radioactive isotope use areas.

Although the CVM consists of 31 structures, only three are currently identified as containing radioactive materials. Only two of these buildings will require a detailed radiological survey for decommissioning. A meter survey to confirm the absence of any long half-life radioisotopes will be conducted in 12 buildings that have had past radioactive materials use.

The BRF consists of a single-story structure of office space, laboratories, and attached vivarium. A swipe survey of the eight identified radioactive material use areas will be conducted. The BRF septic system drainfield will be checked for long half-life isotopes such as tritium and carbon-14. Disposal of radioactive liquid wastes occurred before the early 1970's. While use of this system has been discontinued for about 20 years, long half-life isotopes may still be present.

Under the National Environmental Policy Act of 1969 (NEPA), potential environmental consequences are to be considered in the decision process for all significant Federal actions. Since several of the FDA facilities (FB-8 and BRF) may be decommissioned in the near future, an issue paper (Part C of this document) was prepared by The KEVRIC Company, Inc. that discussed the environmental assessment (EA) requirements for the decommissioning of an FDA facility. The study concluded that FDA should prepare an EA prior to a facility's decommissioning. Also, an Environmental Impact Statement (EIS) could be required for some facilities' decommissioning. However, such a determination can be based on the EA's findings.

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PART A

DECOMMISSIONING FUNDING PLAN

Department of Health and Human Services

Food and Drug Administration

September 30, 1992

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1.0 BACKGROUND

The Department of Health and Human Services of the Food and Drug Administration (FDA) currently holds an NRC license (License Number 08-00482-03 as amended through amendment 46) to operate the following facilities:

- Federal Building 8 (FB-8) located at 200 C Street, S.W., Washington, DC;
- Center for Veterinary Medicine (CVM) located at the Beltsville Research Complex, Beltsville, MD;
- Module One Facility (MOD-1) located at the Beltsville Research Complex, Beltsville, MD; and
- Beltsville Research Facility (BRF) located at the Beltsville Research Complex, Beltsville, MD.

These facilities are shown on a locational map in Figure 1.

The current license expires on December 31, 1992. In accordance with 10 CFR 30.37, to ensure that the operating license does not expire, the FDA must submit the renewal application no later than 30 days before the expiration date of the existing license.

Decommissioning, as used in this report is defined the same as in 10 CFR 30.4, which states that "decommission" means to remove the facility safely from service and reduce residual radioactivity to a level that permits release of the property for unrestricted use and termination of the NRC license.

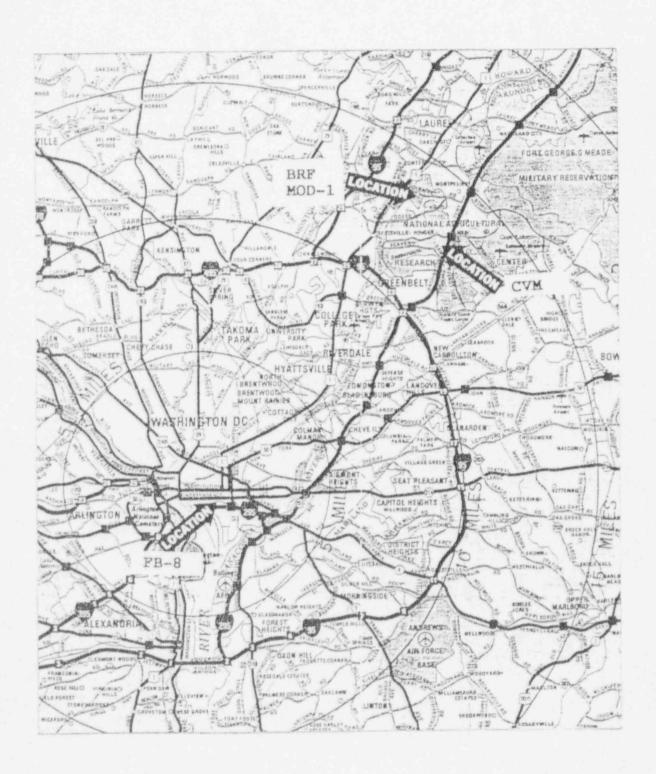
1.1 NRC Requirements

The NRC has established technical and financial regulations for decommissioning licensed nuclear facilities that are listed in the Code of Federal Regulations. The regulations address decommissioning planning needs, timing, funding methods, and environmental review requirements for public and private facilities holding licenses under 10 CFR, Parts 30, 40, 50, 70, and 72. The intent of the regulations is to ensure that decommissioning of all licensed facilities will be accomplished in a safe and timely manner and that licensees will provide adequate funds to cover all costs associated with decommissioning.

The regulations specify that a facility licensee either must set aside money for decommissioning activities or must provide a guarantee through a third party that funds will be available. The funds set aside or guaranteed are determined by a decommissioning funding plan which the licensee provides.

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Figure 1 FDA Facilities Location



Specific requirements are stated in 10 CFR 30.35, "Financial Assurance and Recordkeeping for Decommissioning." 10 CFR 30.35.f.4 state that in the case of Federal, State, or local government licensees, a statement of intent containing a cost estimate—or a value fixed by the regulation and determined by the type of facility—is acceptable. The regulations do not explicitly address the need for a DFP for all Federal, State, or Local government licensees. However, other NRC documents indicate the need for a DFP before the issuance of a new license or the renewal of an existing license.

Specific details of what the NRC considers an acceptable DFP are documented in NUREG-1336, "Interim Guidance on the Standard Format and Content of Financial Mechanisms Required for Decommissioning Under 10 CFR Parts 30, 40, and 70," and subsequent Regulatory Guide (Reg Guide) 3.66 published in June 1990. Also, NUREG-1337, "Interim Guidance on the Standard Review Plan for the Review of Financial Assurance Mechanisms for Decommissioning Under 10 CFR Parts 30, 40, and 70," serves as an outline and checklist for NRC staff reviewers. Reg Guide 3.65, "Standard Format and Content of Decommissioning Plans for Licensees under 10 CFR Parts 30, 40, and 70," outlines the overall decommissioning plan requirements showing the relationship of the DFP to the decommissioning process.

1.2 Status

On July 18, 1990, a letter was sent from Sharon Smith Holston, FDA Associate Commissioner of Management and Operations, to William T. Russel, NRC Region 1 Administrator, providing a certification of financial assurance in the amount of \$750,000.00 for the eventual decommissioning of the FDA facilities in accordance with the governing Code of Federal Regulations. The letter also stated that the FDA would submit a DFP to the NRC along with the next renewal application.

This DFP was developed in conformance with the requirements discussed in the previous section. The costing tables provided in Appendix F of the Reg Guide 3.65 were used as the format for the cost estimates. A funding plan for decommissioning along with the license renewal application will be submitted by FDA to the NRC before December 1, 1992 in accordance with 10 CFR 30.37. If the license expires, all radioactive material research would be required to stop.

A DFP that meets the NRC requirements needs to be based on the elements of a Decommissioning Plan (DP) or a Preliminary Decommissioning Plan (PDP). A PDP is provided in Part B of this document. This PDP was written in accordance with the content outline provided in the Reg Guide 3.65, published in August 1989. The PDP was developed to provide the basis for preparing the DFP. Some parts of the PDP, such as scheduling, decommissioning organization, and specific contractor assistance, will need to be developed for the complete DP once the FDA makes decisions on the decommissioning of one or all of the facilities.

The purpose of the cost estimates contained in the DFP is to provide assurance that, when it is desirable to decommission these facilities, adequate funding will be available. Since the date when decommissioning of the facilities is unknown, separate estimates have been prepared for each of the four facilities. In the event more than one of the facilities is decommissioned at the same time and by the same contractors, some cost reductions should be achievable.

The DFP describes the FDA facilities operations and conditions, the costing assumptions, and the resulting cost estimates for meeting the decommissioning requirements of the NRC.

1.3 Future Activities

This DFP is based on the configuration and use of the FDA facilities as of September 1992. In the future, changes will be incorporated into one or more of the facilities. For example, construction of the Low Level Waste Interim Storage Facility is under consideration near MOD-1. In addition, an area in the FB-8 may be dedicated for interim storage of low-level radioactive wastes. Modifications to the DFP will be required in the future to reflect these and any other changes in the facility configuration and use.

2.0 FACILITY DECONTAMINATION

2.1 Federal Building 8 (FB-8)

Federal Building 8 (FB-8) is located at 200 C Street S.W., Washington, DC. The facility, which was erected in 1961, is a 6-story building with 2 additional basement levels. The building has approximately 460,000 square feet of floor space, and contains offices, laboratories, storage spaces for laboratory samples and specimens, and building utilities. The basement contains equipment for washing laboratory equipment, and incinerating wastes. The garage has a vault for temporary storage of radioactive materials. The location of FB-8 is illustrated in Figures 2 and 3.

FDA staff members perform research studies using radioactively tagged chemicals. The principal radioactive isotopes with long half-lives (more than 90 days) used are tritium and carbon-14. The principal short half-life isotope now being used is phosphorous-32.

A review of available historical records and interviews with selected personnel identified that a number of isotopes have been used in various laboratories throughout the building. In response to changing space requirements, some areas where isotopes have been used have been decontaminated and released for use with other (non-radioactive materials), or for use as office space.

A radiation survey was done on August 3-4, 1992 to assess the amount of radioactivity present in the FB-8 facility. The survey provided guidance in the preparation of the DFP. The results of the survey showed that radioactivity is most probably confined to those areas now posted as radioactive material use areas. The survey indicated that the heating, ventilating, and air conditioning (HVAC) system ducts, which contain the off-gases from the fume hoods, most probably do not contain contamination. The survey revealed that there was no detectable radioactivity in the exhaust ducts just beyond the fume hood or in the building discharge ducts. However, it was not possible to make surveys inside the HVAC ducts.

In addition to radioactivity, there have been a number of hazardous materials used in the FB-8 laboratories. These materials include dioxin, aflatoxin and carcinogens. Since use of these materials creates chemical and biohazard wastes and potential surface contamination, their removal from the FB-8 facility must be considered in light of safety procedures for workers and the public. The removal of all such non-radioactive materials was not included in the scope of this funding plan. However, the cost estimates did consider the increased difficulty these materials imposed on decontamination activities.

A detailed radiological survey of the facility will be conducted in conjunction with decontamination. The radiological survey will consist of swipe surveys of all areas currently identified for use with radioactive materials. The laboratory surfaces will be subdivided into grids approximately 1 meter by 1 meter in size. One swipe will be taken from each grid area, except for the ceiling which will have one swipe every four squares. One swipe also will be

Figure 2 Federal Building 8 Location

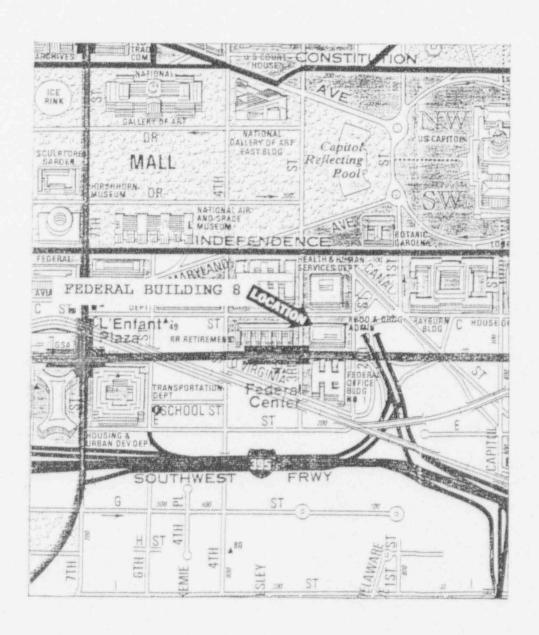


Figure 3 Federal Building 8



taken from the inside of every drawer in the laboratory benches. (Since most drawers are approximately 28 in. by 48 in., this is an area of about 1 square meter). A typical laboratory (10 ft. wide by 26 ft. long) will require 115 swipes.

All offices and laboratories, even if not identified for use of radioactive material will have entrance door handles and floor areas checked by swipes to confirm that these areas are uncontaminated. The swipe survey of door handles and entry areas is required because over the years, radioactive materials may have been used in many spaces that are no longer posted as radioactive material areas.

In addition to the swipe survey of areas that use radioactive material, an instrument survey will be conducted of the areas to detect any non-removable or fixed contamination. The floor tiles and hoppers in the animal laboratories apparently contain the naturally radioactive material thorium. Since the natural radioactivity in the tiles may mask the presence of fixed contamination in the grout between the tiles, samples of the grout will be removed to confirm the presence or absence of radioactivity.

The use of radioactive materials is presently authorized in the FB-8 areas identified in Table 1.

Table 1 Radioactive Use Laboratories - FB-8

Floor	Room Number
Garage	Low-Level Radioactive Waste Storage Area
1	1772, 1830, 1850
2	2052, 2266, 2434
3	3012, 3074, 3756, 3830, 3838, 3842, 3846
4	4418, 4826, 4430
5	5472, 5760, 5772, 5880
6	6028, 6034, 6072, 6082, 6446, 6448, 6838

In each area, decontamination is assumed to be required to 50% of the sink and fume hood interior surfaces, 20% of the bench top surfaces, and 5% of the floor/drawer/cabinet surfaces. Since the ceiling is porous acoustic tile, all contaminated ceiling tiles will be disposed of as low-level radioactive waste. Based on the scoping survey, these estimates are considered high.

A low-level radioactive material storage area located near the FB-8 shipping dock is used as a holding area for packaged radioactive materials for decay of short half life isotopes such as phosphorus-32. This area is assumed to be free from contamination at this time. However, the absence of radioactivity will be confirmed by the final radiation survey.

Decontamination will be performed in those rooms found to have contamination above the levels identified in Table 2. The effectiveness of the decontamination will be demonstrated by repeated swipe survey of the decontaminated surfaces.

Table 2
Acceptable Surface Contamination Levels

NUCLIDE*	AVERAGE ^{b c}	MAXIMUM ^{b d}	REMOVABLE ^{b e}
U-nat, U-235, U-238, and associated decay products	5,000 dpm α/100 cm ²	15,000 dpm α/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	1,000 dpm/100 cm ²	3,000 dpm/100 cm ²	1,000 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.	5,000 dpm β-γ/100 cm ²	15,000 dpm β-γ/100 cm ²	1,000 dpm β-γ/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.

Source: NRC Regulatory Guide 1.86, Table 1, June 1974

^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.

Measurements for 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 dry filter or soft absorbent paper, applying moderate pressure, and assessing the amount of radioactive material on the wipe with an appropriate instrument of know efficiency. When removable contamination of objects of less surface area is determined, the pertinent levels should be reduced proportionally and the entire surface should be wiped.

Each of the laboratories listed in Table 1 will be assumed to contain one 55-gallon drum of assorted solid waste. This waste will consist of abandoned glassware, tubing, spatulas, and a variety of other laboratory hardware. The waste will be treated as low-level radioactive waste. The ten refrigerators which have been used to store tritium-containing specimens and samples will be disposed of as low-level waste due to the difficulty in effectively removing the tritium.

Each floor of FB-8 has large walk-in coolers that have held tritium containing specimens. Although the scoping survey indicates that these coolers are free of contamination, this will be determined with certainty in the final survey and the coolers decontaminated if required. If persistent tritium contamination is found, the coolers will be disassembled and disposed of as low-level waste.

The glove box located in room 4032 is believed to contain dioxin/carbon-14. This glove box will be bagged and checked for the presence of radioactivity and dioxin. If the presence of dioxin is confirmed, the glove box will be packaged in 55 gallon drums and transported to a facility which is licensed for long-term storage of dioxin-containing waste. If dioxin is confirmed not to be present, the glove box will be dismantled, bagged, and transported to a licensed incinerator for destruction.

The fume hoods in some of the posted laboratories will require decontamination. The filters installed in the exhaust duct will be removed and disposed of as low-level radioactive waste. The fume hoods in rooms 3838 and 5772 will be disassembled and disposed of as low-level waste since these have extensive rust areas which will be difficult to decontaminate.

Floor tiles in room 5772 have low levels of fixed contamination. The contaminated tiles will be removed and the underlying concrete will be surveyed. Any contamination found in the concrete will be removed by scabbering.

In some labs, small fixtures such as electrical outlet boxes, water faucets, and fume hood service handles (gas, vacuum, air, etc.) which are found to be contaminated will be removed and disposed of as low-level radioactive waste when the cost of decontamination clearly exceeds the cost of replacement.

The scoping survey identified contamination (about 1,000 cpm/18.5 sq.cm. beta) in the funnel and pipe assembly which previously was used to add liquids to the old FB-8 incinerator. This funnel and pipe assembly (approximately 8-feet-long) will be removed and disposed of as low-level radioactive waste.

An area of contamination was found to be fixed in the concrete at what was the base of the old incinerator. The concrete in this area, estimated at about 36-square feet, will be removed and disposed of as low-level radioactive waste. The contaminated surface concrete will be removed by drilling and spalling the surface. The surface concrete will be removed to a

depth of 2 inches. The resultant rubble will be loaded into 55-gallon drums and disposed as low-level radioactive waste.

The sink traps in the laboratories now posted for radioactive material use will be removed and checked for the presence of contamination. If contamination is found, additional surveys and possibly removal of the drain piping system will be required.

The scoping survey indicated that the HVAC ducts are free of contamination. There was no detectable activity above background radioactivity in the duct's discharge on the building roof or in the fume hood exhaust ducts. This will be confirmed in the final radiation survey by swipes taken within the exhaust ducts.

Table 3 provides a summary of the decontamination options used in FB-8.

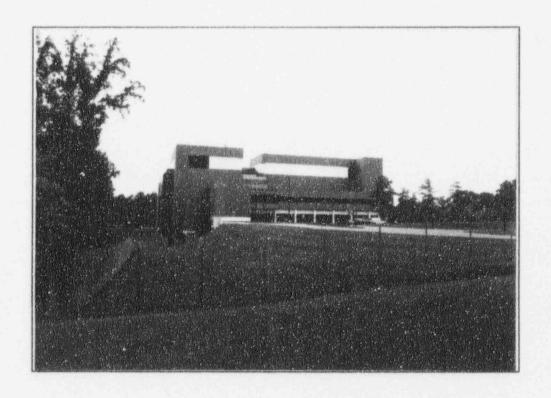
Table 3
Decontamination Options Utilized in FB-8

Component	Option Used	
	Clean to Unrestricted Release Level	Dismantle and Package for Disposal
Fume Hoods	X	X
Glove Boxes		X
Laboratory Benches	X	
Refrigerators & Freezers		X
Walk-in Coolers	X	X
YY dik-iii Coolers		
		X
Filters(Charcoal & HEPA) Walls	X	X
Filters(Charcoal & HEPA)	X X	X
Filters(Charcoal & HEPA) Walls		

2.2 MODULE ONE FACILITY (MOD-1)

Module One Facility (MOD-1) is a 235,000-square foot facility which was completed in 1990. The MOD-1 facility (see Figure 4) is designed for containment of chemical biohazard and radioactive materials. The use of radioactive materials has been rigidly controlled. Nine

Figure 4 Module One Facility



2-9

of the 56 laboratories are reserved for use with radioactive materials. Radioactive liquids are disposed of in a dedicated sink located in a janitor's closet on the first floor. Solid radioactive wastes are accumulated in a temporary holding cage located in the mechanical equipment room. All radioactive materials are confined to laboratory hoods which have local bag-in/bag-out charcoal filters designed to retain radioactive material within the hood-filter assembly. Review of available records indicates that the isotopes used in MOD-1 are limited to tritium, phosphorus-32, and carbon-14.

The MOD-1 facility is new and has established rigid controls to prevent the release of contamination. Therefore, decontamination required for decommissioning will be limited to those areas which are identified for use with radioactive isotopes. These areas are listed in the Table 3.

Table 4
Radioactive Use Areas - MOD-1

oors	Rooms/Laboratories Currently Using Radioactive Materials
Mechanical Rooms	Low-Level Radioactive Waste Storage Area
1	Low-Level Radioactive Waste Liquid Disposal Sink Closet
2	2305, 2313, 2315, 2317, 2321, 2418
3	3404, 3406, 3418

The third-floor laboratories (rooms 3404, 3406, and 3418) are included in the decommissioning plan even though radioactive materials have not yet been used in the rooms. These laboratories have been identified for future radioactive material use. Figures 5, 6, and 7 provide general layouts for the floors.

Figure 5 MOD 1 Ground Floor Laboratories

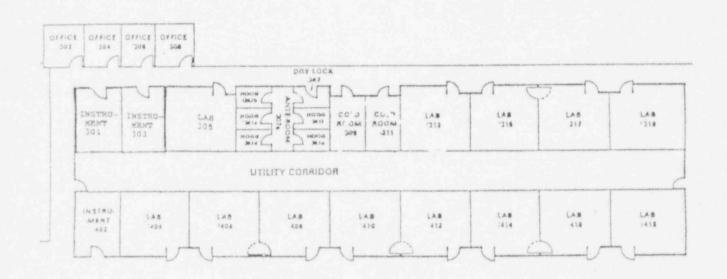


Figure 6 MOD 1 Second Floor Laboratories

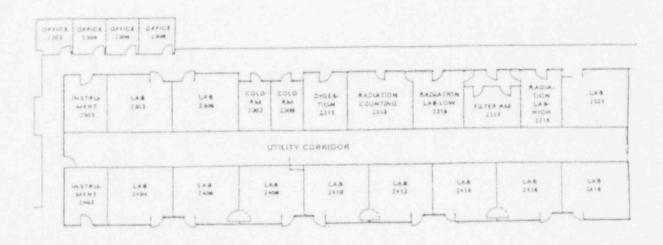
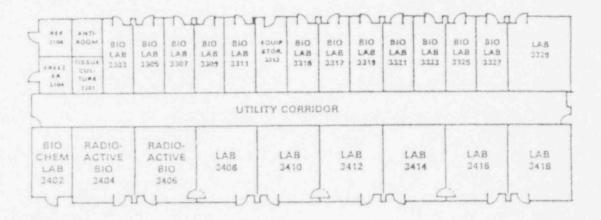


Figure 7 MOD 1 Third Floor Laboratories



Review of available historical records and interviews with personnel at the facility has indicate that there have been several incidents of contamination of laboratory equipment and floors. These contaminations have been minor and have been resolved by the experimenter using the laboratory.

A radiological survey of the facility made on August 5, 1992 indicated no detectable radioactivity in the laboratory ventilation discharge ducts. This provides confidence that the charcoal filters are effective in retaining radioactivity released in the fume hoods of the laboratories designed for use with radioactive materials.

A detailed radiological survey of these areas will be conducted before performing any decontamination work. The survey will consist of swipes of representative surfaces of the areas. In addition a meter survey will be conducted to detect any non-removable contamination. A typical laboratory for the MOD-1 facility will require about 150 swipes. The procedures used in the survey will be the same as the FB-8 facility.

If contamination is found above the levels specified in Table 2, decontamination will be performed. Repeated swipe surveys of the decontaminated surface will be performed as necessary.

Refrigerators and freezers which have had tritium-containing specimens and samples will be disposed of as low-level waste due to the difficulty in effectively removing the tritium.

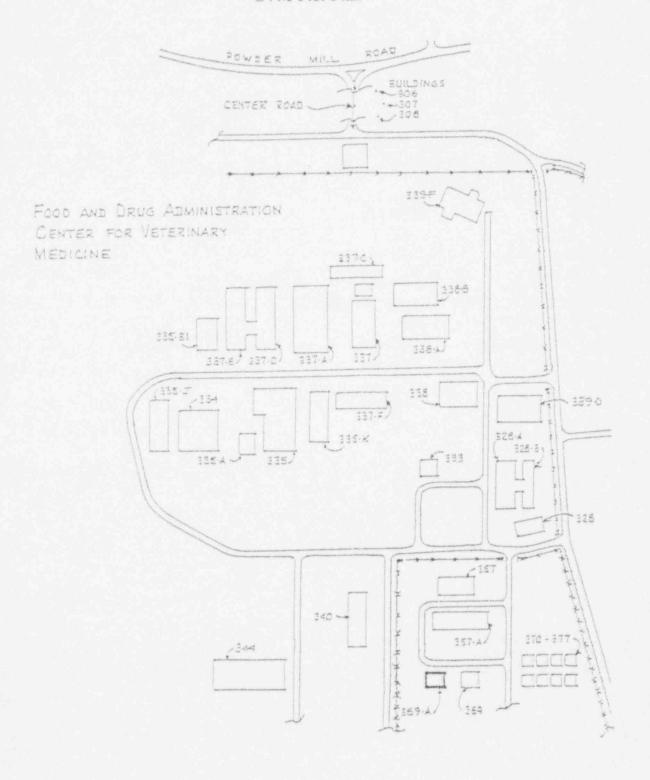
The off-gas ducts from the fume hoods used in the radioactive use laboratories all have bag-in/bag-out filter housings for charcoal filters. These stainless steel filter housings are assumed capable of successful decontamination. The filters will be disposed of as low-level radioactive waste. Swipes will be taken of the exit off-gas ducts to confirm the absence of radioactivity.

Each laboratory will be assumed to have one 55-gallon barrel of assorted low-level radioactive waste. This waste will be abandoned glassware, tubing, gloves, plastic shields, paper, spatulas, etc.

2.3 Center for Veterinary Medicine (CVM)

The Center for Veterinary Medicine (CVM) is a complex of 31 buildings (see Figure 8). The structures include barns, office trailers, modular frame construction buildings, and two openair incinerators. The CVM has used radioactive materials in studies on large animals. Animal liquid wastes have been disposed of by flushing into the U.S. Department of Agriculture (USDA) waste treatment system. Animal tissue has been disposed of by incineration on site. The CVM also has a new incinerator which is undergoing test burns prior to receiving a permit from the State of Maryland.

Figure 8 CVM Plot Plan



Review of historical records and interviews of FDA personnel at the CVM indicate that the principal isotopes used are long half-life tritium and carbon-14 in microcurie quantities. Iodine-125 also has been used.

A radiological survey was performed on August 6, 1992 to scope the amount of radioactivity present in the CVM facilities and provide guidance in the preparation of the DFP. The results of the survey indicated that radioactivity is most probably confined to those areas now posted as radioactive material use areas. The survey also indicated the fume hood exhaust ducts examined do not contain contamination.

A survey to isolate areas which contain radioactivity will be conducted before decommissioning the CVM structures. The radioactive components will be decontaminated to acceptable levels or will be disposed of as low-level radioactive waste.

The use of radioactive materials at the CVM is currently confined to the following spaces:

- · Building 328;
- · Building 338, room 101; and
- Building 334, rooms 103 and 105.

The radioactive material used in building 328 consists of commercially available test kits whose use does not require a license. Consequently, no decontamination activities are planned for building 328.

A radiological survey will be conducted before performing any decontamination work in buildings 338 and 334. This survey will consist of a swipe of representative surfaces in the entire building, as noted below:

- · 100% of areas identified for use with radioactive materials, and
- · door knobs and floor areas at entrance to other labs in the building.

In addition, a meter survey of the two posted laboratories will be conducted to detect any non-removable contamination.

The swipe survey will be based on the following sampling technique. The laboratory surfaces will be subdivided into grids or squares approximately 1 meter by 1 meter in size. One swipe will be taken from each square, except for the ceiling which will have one swipe per every four squares. One swipe also will be taken from the inside of every drawer in the laboratory benches. Decontamination will be performed if contamination is found over allowable levels. Repeated swipe surveys will be taken of the decontaminated surface.

The two refrigerators and the freezer used to store tritium-containing specimens and samples will be disposed of as low-level waste due to the difficulty in effectively removing tritium.

Each laboratory contains a fume hood with HEPA filters in the exhaust ducts. The scoping survey indicates that there is no detectable contamination in the exhaust ducts. Therefore, it is assumed that decontamination will be required only for the inner surfaces of the fume hoods. Swipes will be taken of the exit off-gas ducts to confirm that the ducts are free from radioactivity.

Each of the two laboratories is assumed to have one 55-gallon barrel of abandoned glassware, tubing, gloves, spatulas, etc. This material will be treated as low-level waste.

Since it is reported that some buildings have used radioactive materials in the past, a meter survey will be conducted to detect the presence of any long half-life materials. These buildings are listed below:

328	334
335	339-D
339-F	337
344	338
357	

Interviews with FDA personnel who have been at the CVM facility for a number of years indicate that manure from dosed animals was placed in an open field to compost. The dosed animals also were pastured in an open field. These areas will be surveyed to verify that there is no residual radioactivity present above the limits of Table 2. The combined areas, totaling approximately one acre, will be surveyed by taking soil samples on a 10 by 10 meter grid. The samples will be checked for long half-life isotopes. If the soil is contaminated remedial action will be required.

The old incinerator will be checked by a meter survey and swipes. If radioactivity is detected, a decision will be made whether to decontaminate or dispose of the contaminated parts as low-level waste. The scoping survey indicated that this incinerator does not contain any activity above background levels of radiation. The new incinerator will not be surveyed because it has never been used to incinerate wastes to incinerate wastes.

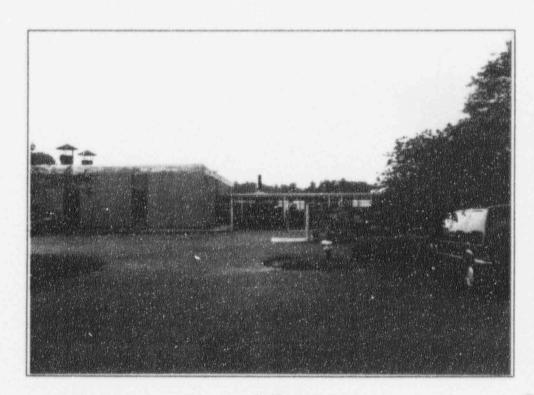
2.4 Beltsville Research Facility (BRF)

The BRF (see Figure 9) consists of a structure containing laboratory and office spaces. A floor plan of the single-story building is given in Figure 10. In addition, there are a number of vivariums and a septic system drainfield that is no longer in use. Some of the BRF studies are conducted using materials with radioactive tracers. The principal isotopes used are tritium, carbon-14, and phosphorus-32.

Review of records and interviews with BRF personnel identified a number of recurring minor contamination events. The minor contaminations are detected during routine health physics surveys of the laboratory spaces. These events primarily involve tritium and carbon-14

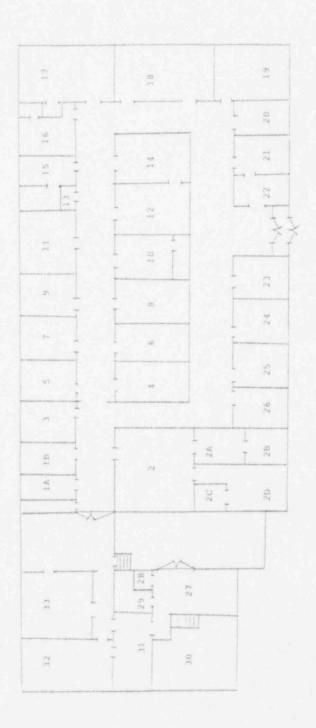
Figure 9 BRF Facility





2-18

Figure 10 BRF Laboratories



contamination. The experimenters utilizing the area are responsible for decontamination efforts.

A radiation survey was performed on August 5, 1992 to scope the amount of radioactivity present in the BRF facility and provide guidance in the preparation of the DFP. The results of the survey indicated that the radioactivity is most probably confined to those areas now posted as radioactive material use areas. The survey showed that the laboratory fume hood ducts examined do not contain contamination. The incinerator was found to have no detectable contamination above background levels.

A detailed radiological survey of the facility will be conducted in conjunction with decontamination work. This will consist of a swipe survey of all areas identified for use with radioactive materials. A meter survey will be conducted to detect any non-removable contamination in the areas identified for use with radioactive materials. In addition, the door handles and floor area at entrances to all other laboratories and offices will be checked by swipes to confirm that they are not contaminated. The swipe survey of door handles and entry areas will be conducted because, over the years, radioactive materials have been used in many spaces that are no longer posted as radioactive material areas.

The room numbers identified as having radioactive materials in use are:

2A	12
6	14
7	17
9	19

In each of the areas, it is assumed that decontamination will be required on 50% of the fume hood and sink surfaces, 20% of the bench top surfaces, and 5% of the floor/drawer/cabinet surfaces. Since the ceiling is porous acoustic tile, all contaminated ceiling tiles will be disposed of as low-level radioactive waste. Based on the August 5, 1992 survey, these estimates are considered high.

The swipe survey will be based on the following sampling technique. The laboratory surfaces will be subdivided into grids or squares approximately 1 meter by 1 meter in size. One swipe will be taken from each square, except for the ceiling which will have one swipe per every four squares. One swipe will be taken from every drawer in the laboratory benches. If contamination is found which exceeds allowable levels, decontamination will be performed. The efficiency of the decontamination will be demonstrated by repeated swipes of the affected surface.

The 5 refrigerators and 2 freezers which have been used to store tritium-containing specimens and samples will be disposed of as low-level waste due to the difficulty in effectively removing tritium.

2-20 Rev: Orig

Each laboratory posted is assumed to contain one 55-gallon drum of assorted solid waste. This waste is from abandoned glassware, tubing, spatulas, and other laboratory hardware. This material will be treated as low-level radioactive waste.

In the future, it is anticipated that radionuclides will be utilized in rooms 2C, 2D, 4, and 5. However, decontamination of these rooms was not included in the cost estimate as the estimate reflects the present utilization of the facility.

Before the early 1970's, radioactive liquid wastes were disposed of into the BRF septic system. While use of this system was discontinued about 20 years ago, it is necessary to determine if the drainfield of the septic system is contaminated. Because of the long period since use, the only isotopes anticipated are tritium and carbon-14. The precise dimensions of the drainfield are unknown. The area believed to include the drainfield will be divided into a 3 meter by 3 meter grid. Soil samples will be taken at each grid point in the drainfield area to determine how much, if any, radioactive material is in the soil. The samples will be taken in the vicinity of the drainfield pipes, which are buried, it is estimated, at a depth of three feet. The samples will be taken on a 3 meter by 3 meter grid throughout the drainfield. While it is anticipated that there will be no activity in excess of the NRC's Reg Guide 1.86 limits, remedial activities will have to be included in the decommissioning if this level is exceeded.

A report was received that laboratory waste material has been buried on the BRF site in the early 1970's. The nature of the waste materials which were alleged to have been buried is unknown. In discussions with senior FDA experimenters, this report has not been confirmed. However, if the report cannot be disproved, it will be necessary to conduct an environmental survey in the suspect areas.

3.0 COST ESTIMATES

3.1 Methodology

An inspection tour of the FDA facilities was held before preparing cost estimates. Historical information was obtained by holding interviews with a number of FDA personnel. The available radiation history records were reviewed. In addition, to obtain estimates of surface areas, room measurements were taken of representative spaces in each of the four facilities. Low-level radioactive waste volumes were based on estimates of the material to be utilized in the conduct of the radiological survey and the decontamination activities.

Because the schedule for decommissioning each of the facilities is not known, the administrative costs are based on decommissioning only one facility at a time. The decommissioning cost estimate for each facility includes estimated costs for a detailed facility decontamination plan, procedure preparation and approval, personnel training, and preparation of the final radiation survey. If more than one facility is decommissioned, the administrative and management costs will be reduced.

3.2 Basis

Cost estimates were obtained from companies and individuals currently offering services related to decontamination and decommissioning. These quotations can be considered order of magnitude cost estimates only, as the individuals supplying the information did not have the opportunity to inspect the facilities or obtain a detailed understanding of the project conditions. In some instances it was necessary to establish cost elements without having a firm basis of cost. However, the resulting total estimates are believed to be high.

The cost of preparing this document has been assigned equally to each of the four facilities. In addition, the plan revision costs and cost estimate revision costs that will be incurred prior to a facility's decommissioning have been added to each facility's costing.

A contingency has been included in the estimate to account for the possibility that the HVAC ducts in FB-8 are found to be contaminated.

A contingency has been included in the estimate to account for the possibility that site remediation may be required at the BRF drainfield.

All radioactive wastes generated by the decontamination of these FDA facilities are Class A low-level waste as defined in 10 CFR 61.

3.3 Assumptions

Several assumptions have been made in preparing this cost estimate. The total cost estimate represents a near maximum funding needed for decommissioning the four facilities and

assuring their release to unrestricted use. An effort was made to have conservative assumptions. The assumptions were made after a review of available records, a scoping radiological survey, and interviews with personnel at the facilities. The major assumptions are described below:

- · One facility will be decommissioned at a time.
- Disposal of all low-level radioactive wastes from the Maryland facilities will be at the Appalachian compact site within the State of Pennsylvania.
- Surfaces to be decontaminated are those located in spaces which have known radioactive sources, excluding naturally occurring radioactive materials of construction.
- The only surfaces in the MOD-1 facility which will require decontamination are in areas which have been designated for radioactive material use.
- The costs for removing non-radioactive biohazard and chemical materials and contaminated surfaces are not included.
- · All labor used in the decommissioning effort will be contract labor.
- A volume allowance of one 55-gallon drum will be included for miscellaneous wastes (experimenters' waste glassware, tubing, etc.) in each laboratory which is to be decontaminated.
- The unused sanitary drainfield at the BRF is assumed to be releasable. This
 assumption must be confirmed by an environmental survey at the time of
 decommissioning. A contingency fund of \$100,000 has been included in the cost
 estimate for site remediation.
- All future activities at the facilities will be assumed to be in accordance with the requirements of the present FDA license. No cost provision has been made for future changes in the license.
- Cost estimates are based upon current (1992) technology and available cost information.
- This estimate does not include the cost of moving FDA personnel and their laboratory equipment to new quarters.
- No cost allowance has been made for removal and shipment of low-level radioactive
 waste at FB-8 prior to the start of decommissioning activities. As of January 1, 1993,
 it will be impossible to ship low-level radioactive wastes from FB-8, as the District of
 Columbia is not a member of a low-level waste compact. At the time

decommissioning of FB-8 occurs, it is assumed that there will be an acceptable waste repository.

 The costs associated with renovating the facility to accommodate the new tenant are not included in the decommissioning cost estimate.

3.4 Results

The resulting cost estimates are presented in Tables 5 through 8. A separate cost estimate table has been prepared for each of the four facilities. The format of the tables essentially follows the format in the NRC Reg Guide 3.65, Appendix F. Changes only have been made to improve readability.

The total cost for decommissioning the four FDA facilities covered by NRC license 08-00482-03 is estimated to be \$1,169,900.

The cost for each of the four facilities is:

FB	\$591,600
MOD-1	\$152,500
CVM	\$ 76,600
BRF	\$349,200

3.5 Cost Escalation

Periodically over the life of the NRC license, it will be necessary to revise the cost estimate for decommissioning because of changes in use of existing facilities, addition of new facilities, changes in waste disposal fees, and escalations in the costs of labor and supplies.

The FDA will revise this DFP and the associated cost estimate on a triennial basis. A revision will be submitted with each NRC license renewal request. In addition, the funding commitment by the FDA will be revised to reflect the changes in decommissioning costs which are predicted by the revised DFP.

The unit costs used in estimating the labor, material and equipment costs for decontamination will be revised utilizing the annual inflation rate which occurs in the 1992-1995 time period.

Because the cost for transportation and disposal of radioactive material are rapidly changing, changes in these costs cannot be projected by the use of standard cost escalation indices. Therefore, it will be necessary to completely revise the cost of transportation and waste disposal at the time the revision is made the DFP.

The FDA facilities are engaged in performing research. Accordingly, the utilization of the facilities is in a constant state of change. The types of experiments which are preformed will result in changes in which isotopes and the amount of the isotopes utilized. Since it is not possible to reliably predict what these changes will be in the future, it will be necessary to reexamine the needs for decontamination and the resulting cost changes at the time the DFP is revised. In general, the trend which has occurred in the past few years and is expected to continue is to utilize radioactive isotopes in fewer experiments and, when used, to use small quantities of the isotope.

As noted in section 1.3, it is anticipated that there will be changes to the facilities covered by this DFP. Some of the modifications could be significant. Modifications to the DFP and the financial commitment for decommissioning will be required at the time these significant facility changes are incorporated into the NRC license.

Table 5 Cost Estimating Tables FB-8

Management of		The second secon	nd Preparatio				
			Work Days				Total
Task		Supervisor	Foreman	<u>H.P.</u>	Technician	Total	Cost
1.	Preparation of Documentation for Regulatory Agencies		-				\$17,500
2.	Submittal of Decommissioning Plan to NRC when required by 10 CFR 30.36(c)(2), 40.42(c)(2), or 70.38(c)(2)	10					\$ 2,300
	Development of Work Plans	37.5	***************************************	of particus about		37.5	\$8,700
	Procuring of Special Equipment			(ser-terment)			N/A
	Staff Training	3	-	1	50	54	\$15,200
).	Characterization of Radiological Condition of the Facility (Including soil and tailings analysis or groundwater analysis, if applicable)	INCLUDED I	N TASK 1		American del Companyone		
	Other	Anna and a second second second		-	-	MARKANIN COMM	N/A
	Total				manufacture de la constitución d	, miles management recomm	\$43,700

Position	Basic Salaries \$/yr)	Overhead Rate (%)	Worker Cost/Hour
Supervisor			\$85
Foreman			N/A
Craftsman	NAME OF TAXABLE PARTY OF TAXABLE PARTY.		\$20
Γechnician			\$35
Health Physicist			220
aborer	the second could be a second and the second		N/A
Other Other			\$29
MICI	And the control of th		W. S. Commence

	No.	<u>Dimensions</u>		No.	Dimensions
Glove Boxes Fume Hood Hot Cells Lab Benches Sink and Drain	1 24 0 - 34	2.5(m³) 232(m²) N/A(m³) 182(m²) 90(m²)	Amount of Floor Space Ventilation Ductwork Amount of Wall Space Other	-	551(m²) N/A(m² 1730(m² N/A(m²

-	Radio	active Facil	ity Compor	nents Decontam	nation	Dismantling !	Cost Table	
Ta	s <u>k</u>	Supervisor	Foreman	Work Days Technicians	<u>H.P.</u>	Craftsmen	Laborer Total	Total Cost
1.	Decon/Dismantle Major Components and/or Processing and Storage Tanks		MARKET MARKET				N/A	N/A
2.	Decon/Dismantle Laboratories, Fume Hoods, Glove Boxes Benches, etc.	40		442	_5_	8	495	\$176,000
3.	Decon/Dismantle Waste Areas - Radwaste Areas - Scrap Recovery Ar - Other	eas	-		-	3	3	\$600
4.	Decon/Dismantle Service Facilities	CONTING	ENCY FO	R HVAC SYST	EM _		university of the second	\$150,000
	Maintenance ShopDecontamination AVentilation SystemOther							
5.	Decon/Dismantle Waste Treatment Facilities and Storage Areas on the Site (Including exhume and package contaminated soil an tailings, if any)							N/A_
	 Fluoride Lagoons Nitrate Lagoons CaF2 Waste Recov Ground Water Res Other 							
6.	Monitor for compliance, reclean and remonitor, if necessary							N/A_
7.						-	Approximately September	N/A

	Decontam	ination/Dismantling	Small Tools Cost T	able	
Equipment/Supply Hand tools, Plastic Bags, Mops, Rags, Brushes, Solutions		1 lc	antity ot	<u>Cost</u> \$16,900	
	Radi	oactive Wastes Pac	kaging Costs Table		
Waste Type	Volume (m³)	No. of Containers	Type of Containers	Unit Cost of Container	Cost of Container
Low-level	12.3	59	55 Gal Drums	\$50	\$2,950
Total	AND PROPERTY OF THE PROPERTY O			Colonial Applicate Annique Assentials Assential Application (Assential Assential Application (Assential Applicati	\$2,950
	Rad	ioactive Wastes Shi	pping Costs Table		
Distance Shipped Unit cost for shipm Additional charges Overweight Surcharges	ent				
Waste Type	No. of Shipments	Unit Cost for Shipping	Distance Shipped	Surcharge	Transportation Cost
Low-level	1	\$3.00	300	-0-	\$900
Total					\$900

	Radio	active Wast	e Disposal C	Cost Table		and the second s
Burial Charges Surcharges Per container Disposal	\$5650 (\$/m³) (\$) (\$/m³)					
Waste Type	Burial Volume		Unit Cost of Burial	Surc	harge	Burial- Cost
Low-level	12.3 m³		\$5650		0-	\$69,500
Total						\$69,500
	Facility Ground's	Contamina	ted Areas - I	Restoration C	ost Table	
Task	Supervisor	Foreman Wo	ork Days H.P.	Clerical	Total	Total Cost
Backfill and Restore Site					N/A	Annual Management Mana
	Fir	nal Radiation	n Survey Co	st Table		
<u>Task</u>	Supervisor	Foreman Wo	ork Days H.P.	Clerical	Total	Total Cost
Survey FDA Review/Submittal Total	15				15	\$127,500 \$ 3,500 \$131,000
	Site Stabiliza	ation, Long-	Term Survei	llance Cost	Гable	
<u>Task</u>	Supervisor	Foreman Wo	ork Days H.P.	Clerical	Total	Total Cost
	NOT APPLICA	BLE				N/A
-		***************************************	-	10.000000000000000000000000000000000000		designated the contraction.

Table 6 Cost Estimating Tables MOD-1

reparation of Documentation or Regulatory Agencies submittal of Decommissioning Plan to NRC when equired by 10 FR 30.36(c)(2), 0.42(c)(2), or 0.38(c)(2)	Supervisor	Foreman	<u>H.P.</u>	Technician	Total	Total <u>Cost</u> \$17,500
occumentation or Regulatory Agencies submittal of Decommissioning Plan to NRC when equired by 10 CFR 30.36(c)(2), 0.42(c)(2), or						\$17,500
Decommissioning Plan to NRC when equired by 10 CFR 30.36(c)(2), 0.42(c)(2), or						
	10			Acres de constitución de la cons	10	\$ 2,300
Development of Vork Plans	37.5	-	September	American Company of the Company of t	37.5	\$8,700
rocuring of pecial Equipment				permanent open ethal School managem		N/A
taff Training	0.5		0.5	5	6	\$2,200
Characterization of Radiological Condition of the Facility (Including oil and tailings analysis or groundwater analysis,	INCLUDED IN	TASE 1				
	INCLUDED IN	I ASK I	and the same of th	***************************************		N/A
	MANAGE SPECIFICATION OF THE SP	-	(SIA SIA SIA SIA SIA SIA SIA SIA SIA SIA	NAME AND ADDRESS OF THE OWNER, TH	and the same of th	\$30,70
V TI III	fork Plans recuring of pecial Equipment aff Training haracterization of adiological Condition the Facility (Including bil and tailings analysis	fork Plans Tocuring of pecial Equipment aff Training haracterization of adiological Condition the Facility (Including bil and tailings analysis groundwater analysis, applicable) The pecial Equipment Including the pecial condition of the Facility (Including bil and tailings analysis groundwater analysis, applicable) Included Incl	fork Plans Tocuring of pecial Equipment aff Training haracterization of adiological Condition the Facility (Including pil and tailings analysis groundwater analysis, applicable) INCLUDED IN TASK 1 ther	fork Plans Tocuring of pecial Equipment aff Training O.5 haracterization of adiological Condition the Facility (Including pil and tailings analysis groundwater analysis, applicable) INCLUDED IN TASK 1 ther	fork Plans 37.5 rocuring of pecial Equipment aff Training 0.5 0.5 5 haracterization of adiological Condition the Facility (Including pil and tailings analysis groundwater analysis, applicable) ther	fork Plans 37.5 Tocuring of Decial Equipment 37.5 aff Training 0.5 0.5 5 6 The Facility (Including bill and tailings analysis groundwater analysis, applicable) INCLUDED IN TASK 1 ther

		Planning	and Preparation Unit Cost Table	e.
Position Supervisor Foreman Craftsman Technician Health Physicist Laborer Clerical Other		asic Salaries \$/yr)	Overhead Rate (%)	## Worker Cost/Hour \$85
			mponents Decontamination and/	
Glove Boxes Fume Hood Hot Cells Lab Benches Sink and Drain	No. 0 6 0 0 8	N/A(m³) 29(m²) N/A (m³) 693(m²) 20(m²)	Amount of Floor Space Ventilation Ductwork Amount of Wall Space Other	No. Dimensions 281(m²) N/A(m²) 552(m²) N/A(m²)

-	Radi	oactive Faci	lity Compoi	work Days	nination	/Dismantling	Cost Table	CONTRACTOR
Та	<u>sk</u>	Supervisor	Foreman	Technicians	<u>H.P.</u>	Craftsmen	Laborer Total	Total Cost
1.	Decon/Dismantle Major Components and/or Processing and Storage Tanks	-	MANUFACTOR TO			And design to consider the constant of the con	AND DESCRIPTION AND DESCRIPTION OF THE PERSON OF THE PERSO	N/A
2.	Decon/Dismantle Laboratories, Fume Hoods, Glove Boxes Benches, etc.	S,	on the second		***************************************		Anniella processo anniella pro	\$31,700
3.	Decon/Dismantle Waste Areas - Radwaste Areas - Scrap Recovery A - Other	reas			-			\$600
4.	Decon/Dismantle Service Facilities - Maintenance Shop - Decontamination - Ventilation System - Other	Areas	an manufacture desired	alternatives and analysis				N/A
5.	Decon/Dismantle Waste Treatment Facilities and Storage Areas on the Site (Including exhume and packag contaminated soil at tailings, if any)			SEASON ASSESSMENT				N/A
	- Fluoride Lagoons - Nitrate Lagoons - CaF2 Waste Reco - Ground Water Re - Other							
6.	Monitor for compliance, reclean and remonitor, if necessary						SAMONANIAN STATE SANDERS	N/A
7.	Other (e.g., contractor fees)		S. ACADONICA VINCE				month for planting the control of th	N/A

	Decontam	ination/Dismantling	Small Tools Cost To	able	
quipment/Supply rushes, Rags, olutions, Gloves lothing, Etc.		-	1 lot	<u>Cost</u> \$2,900	
	Radi	oactive Wastes Pack	aging Costs Table		
Waste Type	Volume (m³)	No. of Containers	Type of Containers	Unit Cost of Container	Cost of Container
Low-level Low-level Total	0.68 2.8 4.1	3 2	55 Gal Drums Refrigerator Freezer	50 N/A N/A	\$900 N/A N/A \$900
Distance Shipped	Rad	tioactive Wastes Ship	oping Costs Table		
Unit cost for shipm Additional charges Overweight Surcharges	nent		mile/truckload) (mile)		
Waste Type	No. of Shipments	Unit Cost for Shipping	Distance Shipped	Surcharge	Transportation Cost
Low-level	1	\$3.00	300	AND DESCRIPTION OF THE PARTY OF	\$900
Total	SERVINGE SER		SAME AND		\$900

	Radio	active Was	te Disposal (Cost Table		
Burial Charges Surcharges Per container Disposal	\$5650 (\$/m³) N/A (\$) N/A (\$/m³)					
Waste Type	Burial Volume		Unit Cost of Burial	Sur	charge	Burial Cost
Low-level	8.8 m ³		\$5650		-()-	\$50,000
				***********		-
Total			Andreas Constitution of Cons	non-later manuscript	***************************************	\$50,000
	Facility Ground's	s Contamina	ated Areas - 1	Restoration (Cost Table	
Task	Supervisor	W Foreman	ork Days H.P.	Clerical	Total	Total Cost
Backfill and Restore Site	Security of the Advances of th					N/A
	Fi	nal Radiatio	on Survey Co	ost Table		
Task	Supervisor	<u>Foreman</u>	ork Days H.P.	Clerical	Total	Total Cost
Survey	womananana	-			MORPORE LANGE TO SAME TO MAKE	\$31,300
FDA Review/Submit	NAMES OF THE PROPERTY OF			-	***************************************	\$3,500
Total		***********			***************************************	\$34,800_
	Site Stabiliz	ation, Long	-Term Surve	illance Cost	Table	
Task	Supervisor	W Foreman	ork Days H.P.	Clerical	Total	Total Cost
	NOT APPLICA	BLE	-	Supplied to a street contribution of		N/A
Standard Control of the Standa		-				

Table 7 Cost Estimating Tables CVM

-		Planning a	nd Preparatio	n Cost Ta	ible		
			Work Days				
Task		Supervisor	Foreman	H.P.	Clerical	Total	Total Cost
1.	Preparation of Documentation for Regulatory Agencies		***************************************	·			\$17,500
2.	Submittal of Decommissioning Plan to NRC when required by 10 CFR 30.36(c)(2), 40.42(c)(2), or 70.38(c)(2)	10				10	\$ 2,300
3.	Development of Work Plans	37.5				37.5	\$8,700
1.	Procuring of Special Equipment						N/A
5.	Staff Training	0.5	2	0.5		3_	\$1,000
6.	Characterization of Radiological Condition of the Facility (Including soil and tailings analysis or groundwater analysis, if applicable)	INCLUDED	IN TASK 1				
7.	Other	-		Management	************************	Application	N/A
8.	Total		-			and the second	\$29,500

		Plann	ing and Preparation Unit Co	ost Tabl	e
Position	Ba	asic Salaries \$/yr)	Unit Cost for Workers Overhead Rate (%)	Worker Cost/Hour
Supervisor Foreman Craftsman Technician Health Physicist Laborer Clerical Other					\$85 N/A \$20 \$35 \$50 \$15 N/A \$29
			Components Decontamination		
	No.	Dimensions		No.	Dimensions
Glove Boxes Fume Hood Hot Cells Lab Benches	0 2 0 -	$ \begin{array}{r} N/A(m^3) \\ 9.7(m^2) \\ N/A(m^3) \\ 9.0(m^2) \\ 10(m^2) \end{array} $	Amount of Floor Space Ventilation Ductwork Amount of Wall Space Other	And the second s	$ \frac{42(m^2)}{N/A(m^4)} \\ \frac{98(m^2)}{N/A(m^2)} $

	Radio	pactive Facil	lity Compor	nents Decontam	ination	Dismantling	Cost Table	
Trans.		Cunamicas	Готового	Work Days	H.P.	Craftsmen	Laborer Total	Total Cost
<u>Ta</u>	Decon/Dismantle Major Components	Supervisor	Foreman	Technicians	ri.r.	Cransmen	Laborer Total	Total Cost
	and/or Processing and Storage Tanks			***************************************		-	SALES CONTRACTOR OF SALES CONTRACTOR	N/A
2.	Decon/Dismantle Laboratories, Fume Hoods, Glove Boxes Benches, etc.				2	_8	10	\$3,500
3.	Decon/Dismantle Waste Areas - Radwaste Areas - Scrap Recovery Are - Other	eas				-	ANNA CONTRACTOR OF STREET	N/A
4.	Decon/Dismantle Service Facilities - Maintenance Shop - Decontamination A - Ventilation System - Other	reas			_			N/A
5.	Decon/Dismantle Waste Treatment Facilities and Storage Areas on the Site (Including exhume and package contaminated soil an tailings, if any)							N/A
	- Fluoride Lagoons - Nitrate Lagoons - CaF2 Waste Recov - Ground Water Resi - Other							
6.	Monitor for compliance, reclean and remonitor, if necessary				Avadences	gangal sala sala sala sala sala sala sala s	SALESTANDON SALESTANDON	N/A
7.	Other (e.g., contractor fees)							N/A

	Decontam	ination/Dismantlin	g Small Tools Cost T	able	
Equipment/Supply Hand Tools, Gloves Mops, Rags Cloths, Solutions			1 lot	<u>Cost</u> <u>\$350</u>	
	Radi	oactive Wastes Pag	kaging Costs Table		
Waste Type Low-level	Volume (m³) 0.68	No. of Containers	Type of Containers 55 Gal Drums	Unit Cost of Container \$50	Cost of Container
Total		Annicolated Patricians Annico			\$150
	Ra	dioactive Waste Sh	ipping Costs Table		
Distance Shipped Unit cost for shipme Additional charges Overweight Surcharges	ent	\$3.00 (S	miles) S/mile/truckload) S/mile) S/mile)		
Waste Type	No. Of Shipments	Unit Cost for Shipping	Distance Shipped	Surcharge	Transportation Cost
Low-level		\$3.00	300	-0-	\$900
Total	annerson les				\$900

	Radio	active Was	te Disposal (Cost Table		
Burial Charges Surcharges Per container Disposal	(\$/m³) (\$) (\$/m³)					
Waste Type	Burial Volume		Unit Cost of Burial	Sur	charge	Burial Cost
Low-level	3.2m³		\$5650		-0-	\$18,250
Total				annonen annonen		<u>\$18,250</u>
	Facility Ground's	Contamina	ited Areas - I	Restoration C	Cost Table	
Task	Supervisor	Foreman W	ork Days H.P.	Clerical	Total	Total Cost
Backfill and Restore Site					***************************************	N/A
	Fit	nal Radiatio	n Survey Co	st Table		
<u>Task</u>	Supervisor	Foreman W	ork Days H.P.	Clerical	Total	Total Cost
Survey FDA Review/Submittal					15	\$20,400 \$ 3,500
Total	Statement Street Statement	SHERROW RAPATION	-	alcolorate was a sensitivity	No beat Anticophician	\$23,000
	Site Stabiliza	ation, Long-	Term Survei	Ilance Cost	Table	
Task	Supervisor	Foreman W	ork Days H.P.	Clerical	Total	Total Cost
	NOT APPLICA	BLE	-			N/A
STREET, STREET	P. ACCES TO SECURITY AND ADDRESS.	400000000000000000000000000000000000000	-	-	manufacture and the second	STATE OF THE PERSON NAMED IN COLUMN 1

Table 8 Cost Estimatin, Tables BRF

		Planning and Pre	paration Cr Ta	able		
		Wor	k Days			
Tasl		Supervisor For	recnan H.P.	Technician	Total	Total Cost
1.	Preparation of Documentation for Regulatory Agencies		making action and appropriate and	description of Association Contr.		\$17,500
2.	Submittal of Decommissioning Plan to NRC when required by 10 CFR 30.36(c)(2), 40.42(c)(2), or 70.38(c)(2)	10			10	\$ 2,300
3.	Development of Work Plans	37.5			37.5	\$8,700
4.	Procuring of Special Equipment			Special states and appropriate	1	N/A_
5.	Staff Training	0.5	0.5	5	6	\$2,200
6.	Characterization of Radiological Condition of the Facility (Including soil and tailings analysis or groundwater analysis, if applicable)	INCLUDED IN TA	SK 1			
7.	Other		- Marine	***************************************		N/A
8.	Total		of street, street,	N. O. S. A. S. C.		\$30,700

		Planni	ng and Preparation Unit Co	st Table	
Position	Bas	sic Salaries \$/yr)	Overhead Rate (9	%)	Worker Cost/Hour
Supervisor Foreman Craftsman Technician Health Physicist Laborer Clerical Other					\$85 N/A \$20 \$35 \$50 \$16 N/A \$29
	Radi	oactive Facility C	omponents Decontamination	n/Disma	ntling Cost Table
					Account to the second s
	No.	Dimensions		No.	Dimensions 239(m ²)

		Work Days				
Tas	<u>Supervisor Foreman</u>	Technicians	<u>H.P.</u>	Craftsmen	Laborer Total	Total Cost
1.	Decon/Dismantle Major Components and/or Processing and Storage Tanks	***************************************			STATE AND ADDRESS OF THE PARTY	N/A
2.	Decon/Dismantle Laboratories, Fume Hoods, Glove Boxes, Benches, etc.	81	10		91	\$26,700
3.	Decon/Dismantle Waste Areas - Radwaste Areas - Scrap Recovery Areas - Other		SERVICE SERVICE	***************************************		N/A
4.	Decon/Dismantle Service Facilities - Maintenance Shop - Decontamination Areas - Ventilation System - Other		- Mad			N/A
5.	Decon/Dismantle Waste Treatment Facilities and Storage Areas on the Site (Including exhume and package contaminated soil and tailings, if any)					N/A
	- Fluoride Lagoons - Nitrate Lagoons - CaF2 Waste Recovery - Ground Water Restoration - Other					
6.	Monitor for compliance, reclean and remonitor, if necessary	Manager Annales				N/A
7.	Other (e.g., contractor fees)		SERVICE AND	**********		N/A

	Decontam	ination/Dismantling	Small Tools Cost T	able	100 Ann ann ann an Ann ann an Ann
Equipment/Supply Hand Tools, Brushes Gloves, Rags, Mops, Solutions, etc.		Quai	and the second s	<u>Cost</u> <u>\$2,400</u>	
	Radi	oactive Wastes Pack	aging Costs Table		
Waste Type	Volume (m³)	No. of Containers	Type of Containers	Unit Cost of Container	Cost of Container
Low-level	0.86	14	55 Gal Drum	\$50	\$700
Total	***************************************	14			\$700
	Rac	lioactive Wastes Shir	pping Costs Table		
Distance Shipped Unit cost for shipme Additional charges Overweight Surcharges	nt		iles) mile/truckload) /mile) /mile)		
Waste Type	No. Of Shipments	Unit Cost for Shipping	Distance Shipped	Surcharge	Transportation Cost
Low-level	1	\$3.00	300	-0-	\$900
Total	AND				\$900

	Radio	active Wast	te Disposal (Cost Table		
Burial Charges Surcharges Per container Disposal	(\$/m³) (\$) (\$/m³)					
Waste Type	Burial Volume		Unit Cost of Burial	Surc	charge	Burial Cost
Low-level	8.m³		\$5650		-0-	\$50,100
				********		*************
Total	-			-		\$50,100
	Facility Ground's			Restoration C	ost Table	Charles of the Control of the Contro
Task	Supervisor	Foreman	ork Days H.P.	Clerical	Total	Total Cost
Backfill and Restore Site	CONTINGENCY	FOR SITE	REMEDIA	NOIT		\$100,000
	Fir	nal Radiatio	n Survey Co	st Table	***************************************	
Γask	Supervisor	Foreman W	ork Days H.P.	Clerical	Total	Total Cost
Survey FDA Review/Submittal	15				15	\$134,200 \$ 3,500
<u>Fotal</u>	SECULO SERVICIO DE SECULO SE			security dynas		\$137,700
	Site Stabiliza	ation, Long-	Term Surve	illance Cost	Table	
Task	Supervisor	Foreman W	ork Days H.P.	Clerical	Total	Total Cost
Manager Control of Con	NOT APPLICA	BLE	-	THE PROPERTY WHEN	Sales Sa	N/A
		Section of the sectio			-	

PART B

PRELIMINARY DECOMMISSIONING PLAN

DEPARTMENT OF HEALTH AND HUMAN SERVICES FOOD AND DRUG ADMINISTRATION

LICENSE NUMBER 08-00482-03

DOCKET NUMBER 30-03017

SEPTEMBER 30, 1992

List of Effective Pages

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PRELIMINARY DECOMMISSIONING PLAN

1. GENERAL INFORMATION

Licensee: Department of Health and Human Services,

Food and Drug Administration (FDA)

Address: FDA, FB-8

Radiation Safety (HFF-14), Rm 6025

200 C Street, S.W.

Washington, DC 20204

License Number: 08-00482-03 as amended through Amendment 46

Docket Number: 30-03917

Facilities Covered:

· Federal Building 8 (FB-8) located at 200 C Street, S.W., Washington, DC

- Center for Veterinary Medicine (CVM) located at the Beltsville Research Complex, Beltsville, MD
- Module One Facility (MOD-1) located at the Beltsville Research Complex, Beltsville, MD
- Beltsville Research Facility (BRF) located at the Beitsville Research Complex, Beltsville, MD

2. DESCRIPTION OF PLANNED DECOMMISSIONING ACTIVITIES

- 2.1. Decommissioning Objective, Activities, Tasks, and Schedules
- 2.1.1. Decommissioning Objective, Activities, and Tasks

This Decommissioning Plan is prepared in compliance with the methods described in U S Nuclear Regulatory Commission (NRC) Regulatory Guide (Reg Guide) 3.65, August 1989.

The objective of decommissioning the four identified FDA facilities is to remove radioactivity from the facilities and return them to a condition which will permit unrestricted and unlimited access.

The first step in decommissioning will be to remove all laboratory equipment and specimens contained within the facility.

Following removal of equipment and specimens, an extensive radiological survey of the facilities will be conducted. All contamination which is detected by the survey will be removed to the levels identified in Table 1, Acceptable Surface Contamination Levels, in accordance with the requirements, NRC Regulatory Guide 1.86.

Facility equipment and systems which cannot be decontaminated to the acceptable levels will be removed from the facilities as low-level waste. Examples of this could include contaminated laboratory fume hoods, laboratory benches, etc.

Prior to release of the facilities for unrestricted use, the final radiation survey will be submitted to Industrial and Medical Nuclear Safety, U.S. Nuclear Regulatory Commission, Washington, DC 20555 and to Administrator, U S Nuclear Regulatory Commission Region 1, King of Prussia, PA 19405.

Prior to any decommissioning work being initiated, a decommissioning project plan will be prepared for and approved by FDA senior management. This plan shall define in detail all work to be performed and the identity of persons responsible for the safe and effective completion of each of the decommissioning tasks. A separate project plan shall be prepared for each facility to be decommissioned.

As of January 1, 1993, it will be impossible for the FDA to ship low-level radioactive wastes from FB-8 as the District of Columbia is not a member of a low-level waste compact. At time decommissioning of FB-8 occurs, it is assumed that there will be an acceptable waste repository. If such a repository does not exist, a portion of the FB-8 facility will have to be designated as a long-term storage location for the wastes generated in the FB-8 facility. In preparation of this plan, it is assumed that this legislative problem will be resolved.

2.1.2. Description

The branches of the FDA covered by this NRC license are the Center for Food Safety and Applied Nutrition (CFSAN), the Center for Drug Evaluation and Research (CDER), located in FB-8 and MOD-1, and the Center for Veterinary Medicine (CVM).

The CFSAN is a science based regulatory arm of FDA responsible for providing protection to American consumers by assuring that domestic and foreign industries meet their responsibility of supplying the consumers with safe, pure, and honestly labeled food products and safe, honestly labeled cosmetic products. In the performance of this mission, CFSAN personnel utilize the laboratories, offices, and services available in the FB-8, the BRF, and MOD-1.

CDER's regulation and monitoring of the development, testing, manufacture, sale, and post-marketing experience of drugs is based in science, medicine and law. In the performance of this mission, CDER personnel utilize the laboratories, offices, and services available in the FB-8 and MOD-1.

TABLE 1
ACCEPTABLE SURFACE CONTAMINATION LEVELS

NUCLIDE*	AVERAGE* 6	MAXIMUM ^{b d}	REMOVABLE* *
U-nat, U-235, U-238, and associated decay products	5,000 dpm α/100 cm ²	15,000 dpm a/100 cm ²	1,000 dpm α/ 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	1,000 dpm/100 cm ²	3,000 dpm/100 cm ²	1,000 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.	5,000 dpm β-γ/100 cm ²	15,000 dpm β-γ/100 cm ²	1,000 dpm β-γ/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.

^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.

"Measurements for 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 dry filter or soft absorbent paper, applying moderate pressure, and assessing the amount of radioactive material on the wipe with an appropriate instrument of know efficiency. When removable contamination of objects of less surface area is determined, the pertinent levels should be reduced proportionally and the entire surface should be wiped.

2-2

Source: NRC Regulatory Guide, 1.86, Table 1, June 1974.

The mission of the CVM is to regulate the interstate marketing and use of animal drugs, devices, feeds, and food additives. In the performance of this mission, the laboratories, offices, and services available at the CVM are utilized.

Federal Building 8

Federal Building 8 (FB-8) is located at 200 C Street S W, Washington, DC. The facility, which was erected in 1961, is a six story building with an additional two basement levels. The building with approximately 460,000 square feet floor space, contains offices, laboratories, storage spaces for laboratory samples and specimens, and building utilities. The basement contains equipment for washing laboratory equipment, incinerating wastes, and temporarily storing radioactive materials.

FDA staff members perform research studies using radioactive tagged chemicals in the conduct of their experiments. The principal radioactive isotopes with long half-lives (more than 90 days) used are tritium and carbon-14. The principal short half-life material now being utilized is phosphorous-32. However, in the recent past, a large number of other isotopes have been used.

Module One Facility

Module One (MOD-1) is a 235,000 square foot facility which was completed in 1990. The MOD-1 facility is designed for containment of chemical, biohazard and radioactive materials. The use of radioactive materials has been rigidly controlled. Nine of the 56 laboratories are reserved for use with radioactive materials. Radioactive liquids are disposed of in a dedicated sink located in a janitor's closet room on the first floor. Solid radioactive wastes are accumulated in a temporary holding cage located in the mechanical room. Decommissioning of this facility will require decontamination only of these spaces which are dedicated for radioactive material use. All radioactive materials are confined to laboratory hoods which have local bag-in/bag-out charcoal filters designed to retain radioactive material within the hood-filter assembly. Review of available records indicates that the isotopes utilized in MOD-1 have been limited to tritium and carbon-14.

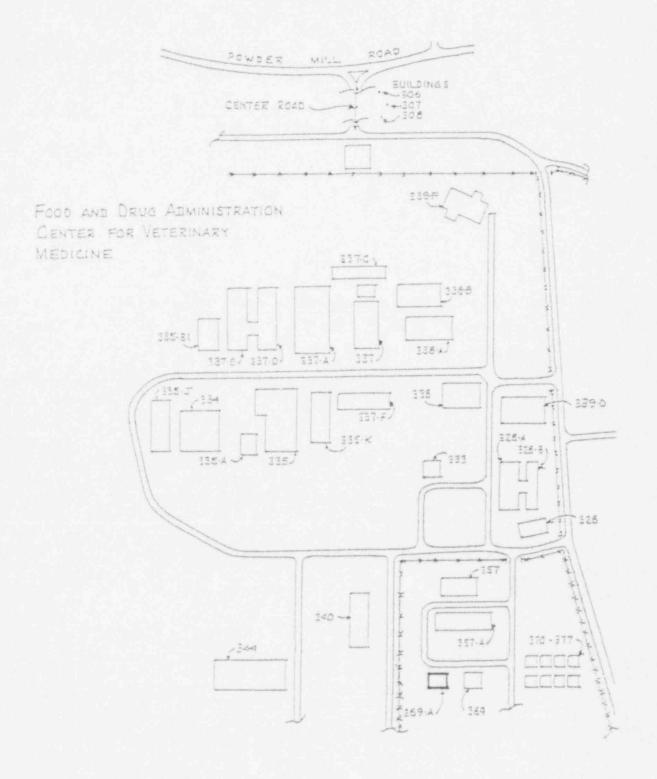
Center For Veterinary Medicine (CVM)

The CVM is a complex consisting of 31 structures (see Figure 1). The structures include barns, office trailers, modular frame construction buildings, and three open air incinerators. The CVM has utilized radioactive materials in studies on large animals. The principle isotopes utilized are long half-life tritium and carbon-14 in microcurie quantities. Animal liquid wastes are disposed of by flushing into the USDA waste treatment system. Animal tissue has been disposed of by incineration on site.

Decommissioning of the CVM structures will be conducted following a survey to isolate those areas which contain radioactivity. The radioactive components will be decontaminated to acceptable levels or will be disposed of as low-level waste.

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FIGURE 1 CVM PLOT PLAN



Beltsville Research Center (BRF)

The BRF consists of a structure containing laboratory and office spaces. In addition, there are a number of vivariums and a sanitary drain absorption field (no longer in use). Done at the BRF studies are conducted utilizing materials with radioactive tracers. The principal isotopes utilized are tritium, and carbon-14.

Decommissioning of the BRF facilities will be preceded by an extensive radiological survey to identify those site areas which are contaminated. This survey will include sampling of surrounding lands. Following the survey, contaminated areas and equipment will be decontaminated or disposed of as low-level radioactive waste.

2.1.3. Procedures

All decommissioning activities and tasks will be prepared and conducted in accordance with written procedures. These procedures will be reviewed and approved by the Decommissioning Procedures Review Committee (DPRC). The DPRC will consist of, but not be limited to the following FDA personnel:

Staff Health Physicist, Industrial Hygienist, Facilities Manager of the affected facility, Chemical Safety Officer, and a representative of the Deputy Director.

The DPRC will ensure that all procedures for performing the decommissioning activities have considered all applicable industry and government codes and standards, the safety of the general public and workers, ALARA, the state of the facility at the time work is to be performed, and that due regard has been taken of any unique chemical or biohazard which may exist at the time of decommissioning activity.

All work done by contractors will be performed under written procedures prepared by the contractor. Prior to start of work, the contractor procedures will be reviewed and accepted by the DPRC.

2.1.4. Schedules

Decommissioning of any of these FDA facilities is not anticipated until after 1998. Thus, detailed schedules can not be provided at this time. Prior to initiation of any decommissioning activities, detailed work schedules will be prepared and will be incorporated into a revision of this Decommissioning Plan.

2.2. Decommissioning Organization and Responsibilities

Decommissioning of these FDA facilities in not anticipated until after 1998. Accordingly, it is not appropriate to establish the organizational responsibilities at this time. Following the decision to decommission the facilities, an organization and responsibilities matrix will be prepared under the direction of the Director, Food and Drug Administration. A description of this organization will incorporated into a revision of this Decommissioning Plan.

2.3. Training

All personnel who participate in the decommissioning of these facilities will receive training which is specific to the particular facility being decommissioned. The training will include general and specific radiological safety training. In addition, specialized chemical safety training will be provided to those personnel who are required to work in areas which may have exposure to materials which are toxic, infectious, and cancer biohazard.

2.4 Contractor Assistance

The FDA recognizes that the responsibility for all decommissioning activities rests with the FDA. This responsibility will be exercised fully during all decommissioning activities.

It is anticipated that decontamination and decommissioning work will be performed by contractors. Since the decommissioning of the FDA facilities will not occur until some years in the future, no selection of contractors has occurred. This Decommissioning Plan will be amended to include the contractor qualifications and administrative controls to be utilized prior to start of the decommissioning activities.

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3. DESCRIPTION OF METHODS USED FOR PROTECTION OF OCCUPATIONAL AND PUBLIC HEALTH AND SAFETY

3.1 Facility Radiological History Information

In the conduct of the activities required to perform their mission, the CFSAN, CDER, and CVM have used a number of chemical materials which have been tagged with radioactive isotopes. Recently, however, the use of these tagged chemicals has decreased significantly. At this time, the quantities of isotopes utilized are principally in microcurie amounts.

3.1.1 Federal Building 8

The principal isotopes now being used the FB-8 facility are tritium, carbon-14, and phosphorus-32. Review of records has shown that the following isotopes have also been used:

phosphorus-32	zinc-65
sulfur-35	technetium-99
iron-55	cadmium-109
iron-59	cadmium-115
chromium-64	iodine-125

In addition, limited quantities of natural uranium have been used. Over the past 30 years, these isotopes have been utilized in numerous laboratories throughout the building. In response to changing space requirements, some of the areas where isotopes have been utilized, have been decontaminated and released for use with other, non-radioactive materials or for use as office space.

Prior to the early 1980's, radioactive liquid and solid wastes were disposed of by incineration in an incinerator located in the subbasement of FB-8. Subsequently, solid radioactive wastes were disposed of by packaging and shipment to a federal waste repository. The incinerator was replaced in the early 1980's. This new incinerator is used for pathological materials only.

Records show that millicurie amounts of tritium, carbon-14, phosphorus-32, sulfur-35, and natural uranium have been disposed of to the sanitary sewer. In a recent (August 1992) survey of the sanitary sewer liquid, no alpha, beta, or gamma radiation above background was found.

A review of available records and interviews with personnel who have been at the FB-8 facility disclosed the spills of radioactive materials which have occurred have been small (microcurie quantities). Decontamination from these spills has been done successfully by the experimenters, under supervision of the FDA staff Health Physicist.

The only abnormal event involving radioactive materials found in the facility records was a record of an explosion in 1978. The explosion occurred in a glass apparatus located on the steam table inside a fume hood. The chemical mixture which exploded contained approximately 0.1 microcurie of carbon-14. The glass apparatus was shattered by the

explosive decomposition of chemicals being heated. The experimenter performing the operation received minor cuts. The investigation which followed the event determined that there was no detectable activity released outside the fume hood.

A fire occurred in the early 1980's on the third floor of FB-8 which resulted in substantial damage to the facility. This fire originated in room 3748. The fire was confined to areas which did not contain radioactive materials. A survey taken immediately after the fire demonstrated that there was no release of radioactive material.

A radiation survey was done on August 3 and 4, 1992 to scope the amount of activity present in the FB-8 facility. This survey was designed to provide insight into how limited or extensive the spread of radioactivity has been in the building. The survey provided guidance in the preparation of this Decommissioning Plan and the decommissioning funding plan. The results of the survey demonstrated that there is high probability that radioactivity is confined to only those areas now posted as radioactive material use areas. The survey demonstrated that there is high probability that the HVAC system ducts, which contain the off-gas from the fume hoods, do not contain contamination - the survey revealed that there was no detectable activity in the exhaust ducts either just beyond the fume hood or in the discharge ducts on the building roof.

In addition to radioactivity, there have been a number of hazardous materials used in the FB-8 laboratories. These materials include dioxin, aftatoxin, and carcinogens. Since these generate chemical and biohazard wastes and have the potential to contaminate surfaces, their removal from the FB-8 facility must be considered in the work procedures for safety to the workers and the public.

3.1.2 Module One Facility

MOD-1 is a new facility with relatively little operating history. Review of available records and interviews with personnel at the facility has indicated that there have been several incidents of contamination of laboratory equipment and floors. These contaminations have been minor and have been resolved by the experimenter utilizing the laboratory.

A radiological survey of the facility made on August 5, 1992 demonstrated that there is no detectable activity in the laboratory ventilation discharge ducts, giving confidence that the HEPA and charcoal filters are effective in retaining any activity released in the fume hoods in the laboratories designed for use with radioactive materials.

3.1.3 Center for Veterinary Medicine

Review of records and interviews of personnel at the CVM indicates that the principal isotopes utilized are tritium and carbon-14. Iodine-125 has also been used.

A radiological survey was performed on August 6, 1992 to scope the amount of activity present in the CVM facilities. This survey was designed to provide insight into how limited or extensive the spread of radioactivity has been in the facilities. This survey provided guidance in the preparation of this Preliminary Decommissioning Plan and the Decommissioning Funding Plan. The results of the survey demonstrated that there is high

3-2 Rev: Orig

probability that radioactivity is confined to only those areas now posted as radioactive material use areas. The survey also demonstrated that there is high probability the fume hood exhaust ducts do not contain contamination.

In 1978, an incident occurred in building 337 which resulted in the release of kepone. The kepone may have been tagged with carbon-14. The extent of the release was judged by the post-incident investigation to result in insignificant exposures to all effected workers. The maximum amount of airborne kepone ingested by personnel was analyzed to be less than 1x10(-6) grams. The total amount of carbon-14 which could have been used in the kepone was less than 400 microcurie. Based on interviews with FDA personnel, there is belief that the kepone was not tagged because of the problems associated with disposal of material containing radioactive kepone.

In the 1970's, feeding studies were done with cattle. The dosed cattle were pastured in an open field and the manure was collected and spread on a manure compost pile. The manure pile area was surveyed on August 6, 1992 and found to be the same as soil which is believed to never have been used for isotope work.

The CVM has three incinerators. The newest incinerator has never been used as the essential utilities have not yet been installed. The second incinerator may have been used to burn deregnated material. The August 6, 1992 survey revealed no activity above background on this old incinerator. The third incinerator is inoperative and has not been used for many years.

3.1.4 Beltsville Research Facility

Review of records and interviews with BRF personnel has identified a number of recurring minor contamination events. The minor contaminations are detected during the routine health physics survey of the laboratory spaces. These events primarily involve tritium and carbon-14 contamination. The experimenter utilizing the area is responsible for decontamination efforts.

A radiation survey was done on August 5, 1992 to scope the amount of activity present in the BRF facility. This scoping survey was designed to provide insight into how limited or extensive the spread of radioactivity has been in the facilities. This survey provided guidance in the preparation of this Preliminary Decommissioning Plan and the Decommissioning Funding Plan. The results of the survey demonstrated that there is high probability that radioactivity is confined to only those areas now posted as radioactive material use areas. The survey demonstrated that there is a high probability that the laboratory fume hood ducts do not contain contamination. The incinerator was found to have no detectable contamination above background.

Before 1970, all contaminated liquids were placed into the BRF septic system. Urine and fecal materials from dosed animals were also placed in the BRF septic system. This system consisted of four septic tanks which flowed into a drainfield adjacent to the BRF animal shelters. Dry wells were installed at the end of the drainfield tiles. About 1970, an aerobic system was installed because the septic system drainfield piping became clogged. The aerobic system consisted of the four septic tanks and a package aerobic sewage treatment

system. The final discharge from the aerobic system was to an open field. This system remained in service until the mid 1980's when the BRF sewage system was connected to the Washington Suburban Sanitary Commission system.

All contaminated materials, solid and liquid, are now collected and disposed of as low-level radioactive waste.

A report was received that laboratory waste material has been buried on the BRF site in the early 1970's. The nature of the waste material alleged to have been buried is unknown. In discussions with senior FDA experimenters, this report has not been confirmed.

3.2 Ensuring that Occupational Radiation Exposures Are As Low As Is Reasonably Achievable (ALARA)

The FDA has not established an ALARA program. The quantity of radioactive materials handled are so small that the doses associated with the use of the materials are minimal. Even though there is no formal ALARA program, the conduct of experiments is reviewed to insure that quantities of isotopes utilized and doses are kept to a minimum. The practice of minimizing exposure to radioactive materials will be continued throughout the decommissioning process.

3.3 Health Physics Program

The health physics program is under control of the FDA Staff Health Physicist, who has the authority to stop all work at any time he considers the work progress to be conducted in a manner which is contrary to safe work practices or in violation of approved procedures. Prior to work commencing, the staff Health Physicist and the Radiation Safety Committee must approve the work plans and the protocol controlling the work.

Because the quantities of radioactive materials available in the FDA facilities are very small, the opportunity for receiving recordable dose is small. However, as a safeguard, personnel routinely assigned to work with radioactive materials, except for tritium and carbon-14, are required to wear thermoluminescent dosimeters. This practice will be continued throughout all decommissioning activities.

3.4 Contractor Personnel

All contractor personnel who are involved in the decommissioning activities will be required to conform to all radiological and safety requirements as though they were FDA personnel. To ensure compliance with all applicable requirements and procedures, designated FDA personnel will continuously monitor the actives of contractor personnel through use of periodic audits, inspections, and surveys. The FDA staff Health Physicist and Industrial Hygienist will perform daily inspections of the contractor activities.

3.5 Radioactive Waste Management

During the decommissioning, quantities of low-level wastes will be generated by the decontamination activities. These wastes will be collected, bagged in plastic, and marked as low level radioactive waste. The plastic bags will be collected daily and loaded into 55 gal drums. The drums will be located in a designated temporary holding area prior the shipment to the designated waste site.

4. PLANNED FINAL RADIATION SURVEY

4.1 Federal Building 8

The final radiation survey will consist of a swipe and instrument survey of all spaces to be decommissioned. The instrument survey will be utilized to detect and measure fixed contamination and the swipe survey will detect and measure removable contamination. The swipe survey is required as the principal isotopes utilized are tritium and carbon-14 which have long half-lives and are low energy beta emitters. For the FB-8, this survey will consist of smears of representative surfaces as described below:

- · 100% of the surfaces in areas identified for radioactive material use, and
- all door knobs and the floor at the entry to the laboratory and offices not currently
 posted as radioactive material use areas.

This methodology is to be utilized since, over the 30 years of FB-8 use, radioactive materials have been used in many spaces which are now considered to be available for unrestricted use. As an assurance that all spaces are free from contamination, the most probable locations for the contamination entry will be checked for evidence of contamination. If evidence of contamination is detected, the suspect area will be posted, thoroughly surveyed, and decontaminated as required.

4.2 Module One Facility

The MOD-1 is a new facility which has instituted stringent administrative controls which assure that radioactive materials are contained in designated areas. Therefore, the final radiation survey of this facility will constitute 100% swipe and instrument survey only of those areas which are designated for radioactive material use.

The off-gas ducts from the bag-in/bag-out filter units used in each of the laboratory will be swipe surveyed to confirm that the off-gas ducts are not contaminated.

4.3 Center for Veterinary Medicine

The final radiation survey for the CVM facility will consist of a swipe and instrument survey of all spaces to be decommissioned. As with the FB-8, the survey will consist of a swipe survey of those areas identified for radioactive material use, and the door knobs and entry floor area for all other facilities. Swipes will be taken from the floor drains to confirm that there is no residual radioactivity.

4.4 Beltsville Research Facility

The final radiation survey of the BRF will consist of a swipe and instrument survey of all spaces to be decommissioned and an environmental survey. The swipe survey will be similar to the FB-8 survey. All areas in which radioactive material is being used will be given a 100% swipe survey. All other laboratories and offices will have the door knobs and entry

4-1

floor area swipe surveyed. If evidence of contamination is found, the suspect area will be posted and a complete survey performed.

The drainfield of the BRF septic system will be surveyed by taking soil samples throughout the drainfield. The drainfield will be divided into squares approximately 3 meters by 3 meters in size. Each of the squares will be sampled. Sampling will be accomplished by drilling holes about 1.3 meters deep (the actual depth will depend upon the depth of the drainfield piping) and a radiation sensing meter lowered into the hole. In addition, soil samples will be taken for analysis at a laboratory with the capability of detecting carbon-14 and tritium at the picacurie level. If contamination is found in excess of NRC limits, the contaminated soil will be removed and treated as low-level radioactive waste. The survey will be extended to the extent requires to remove all unacceptable contamination.

Preliminary surveys have been made of the fume hood exhaust systems. This survey indicates that there is no contamination in the exhaust duct systems. However, this will be confirmed by the final survey which will include swipes and instrument survey of the interior of the exhaust ducts. Special attention will be given to those portions of the duct system where changes in air flow occurs. If contamination is found in excess of the levels identified in Table 1, the ducts will be decontaminated or removed.

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5. FUNDING

A preliminary estimate of the cost for decommissioning the FDA facilities has been prepared and is presented in the Decontamination Funding Plan. This preliminary cost estimate is based upon the present use and condition of the FDA facilities. An estimate has been prepared for each of the facilities as facility decommissioning may occur at different times.

An updated detailed cost estimate for decommissioning, comparison of that estimate with present funds committed for decommissioning, and a plan for assuring the availability of adequate funds for completion of decommissioning will be provided prior to the initiation of decommissioning activities.

Since the Food and Drug Administration is a U.S. government agency, financial assurance is provided by the letter of intent to obtain the necessary decommissioning funds when required.

6. PHYSICAL SECURITY PLAN AND MATERIAL CONTROL AND ACCOUNTING PLAN PROVISIONS IN PLACE DURING DECOMMISSIONING

Access to all of the FB-8 and MOD-1 facilities is controlled. Only FDA employees and authorized visitors are permitted access. All personnel are required to wear identification badges while in the facility. At the time of decommissioning, this practice will be extended to the BRF and CVM facilities and will be continued throughout decommissioning activities.

The FDA facilities covered by the NRC license do not require or have an NRC-approved physical security planerial.

PART C

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ENVIRONMENTAL ASSESSMENT REQUIREMENTS PAPER FDA FACILITIES DECOMMISSIONING

PURPOSE

The purpose of this study is to discuss and make a recommendation as to whether an environmental assessment (EA) or environmental impact statement (EIS) should be performed as part of the decommissioning of Food & Drug Administration (FDA) facilities currently under NRC License No. 08-00482-03. This study reviews the definition of decommissioning as well as the applicable federal environmental legislation, implementing regulations and the specific FDA environmental regulations that apply to decommissioning of their facilities. Additionally, this study draws from site visits, FDA staff interviews, several pertinent phone conversations with federal environmental staff as well as FDA staff. A recommendation is made on the appropriateness and requirements of performing an EA/EIS on the decommissioning of FDA facilities.

DISCUSSION

Background

The KEVRIC Company is performing a scope of work for FDA to develop a Decommissioning Funding Plan (DFP) in accordance with the U.S. Nuclear Regulatory Commission Regulation (NRC) as specified in (53 FR 24018, June 27, 1988). The rules define "Decommissioning" in the following manner, "to safely remove nuclear facilities from service and reduce residual radioactivity to a level that permits release of the property for unrestricted use and termination of the license."

Some major decommissioning activities include the following:

- · Planning and preparation of the facility and site decommissioning,
- · Decontamination of radioactive facility components,
- · Packaging, shipment, and disposal of radioactive wastes,
- · Disposal of biohazards and mixed wastes, and
- · A final radiation survey.

The decommissioning of FDA facilities may entail the removal of some equipment and facility systems. Although, some parts of facilities building may require only minor or no decontamination.

Federal Environmental Legislation & Regulations

The National Environmental Policy Act of 1969 (NEPA) and the Council on Environmental Quality (CEQ) implementing regulations of 40 CFR 1500-1508, Nov. 29, 1978 provide some guidance and requirements for federal agencies concerning EA's and EIS's.

- When necessary an EA will be prepared under the individual agencies adopted procedures (in this case, FDA's implementing regulations) that supplement the CEQ regulations.
- · An EA is not necessary if the agency (FDA) has decided to prepare an EIS.
- An agency may prepare an EA (although not required to) on any action at any time in order to assist agency planning and decisionmaking.

The CEQ implementing regulations also address the decision to prepare an EIS. The regulations state that an agency (in this case FDA) shall determine, based on their implementing regulations, whether the proposed action (decommissioning of their facilities) falls under either of the following conditions:

- · Normally requires an EIS, or
- Normally does not require either an EIS or EA based on the agency's (FDA's)
 categorical exclusions defined in their implementing regulations (supplemental to
 CEQ's).

If the proposed action is not covered by either of the above conditions, then the agency must prepare an EA. If the agency (FDA) prepares an EA the agency must utilize this EA to determine whether an EIS is required or whether to prepare a Finding of No Significant Impact (FONSI) from the EA.

FDA Environmental Implementing Regulations

The FDA promulgated its environmental implementing regulations in 21 CFR Parts 25.1-25.5. These parts supplement the CEQ implementing regulations. The FDA regulations state that all FDA actions are subject to environmental consideration, and that, each action shall be examined for potential environmental impact unless excluded as a class by a categorical exclusion.

Certain FDA actions listed in the FDA implementing regulations are Subject to categorical exclusions. That means these actions do not ordinarily require the preparation of an EA because, they are considered by FDA not to cause significant environmental effects. One class defined by FDA (of particular relevance to this study) is given in the following paragraph.

Routine maintenance and minor construction activities, except for properties listed on or eligible for listing on the National Register of Historic Places.

- Repair to or replacement of equipment or structural components (doors, roof, windows, etc.) of facilities controlled by FDA.
- Lease extensions, renewals, or succeeding leases.
- Construction or lease construction of 10,000 square feet or less of occupiable space.
- · Relocation of employees into existing owned or currently leased space.
- Acquisition of 20,000 square feet or less of occupiable space in a structure that was substantially completed before the issuance of solicitation for offers.
- Acquisition of between 20,000 square feet and 40,000 square feet of occupiable space
 if it constitutes less than 40 percent of the occupiable space in a structure that was
 substantially completed before the solicitation for offers.

The FDA regulations state that FDA will require an EA for any specific action that ordinarily is excluded if the agency has sufficient evidence to establish that the specific proposed action may significantly affect the quality of the human environment.

The FDA regulations address the preparation of EIS's as well as that of EA's. They indicate that there are no categories of agency actions that routinely require the preparation of an EIS. However, the FDA regulations state that EIS's are prepared for agency actions when the following conditions exist.

- Evaluation of data in an EA leads to a finding by the responsible FDA official that a
 proposed action may significantly affect the quality of the human environment under
 the criteria in 40 CFR 1508.14 and 1508.27.
- Initial evaluation by the responsible FDA official of any action, including any action
 for which an EA would otherwise be required, establishes that significant
 environmental effects may be associated with one or more of the probable courses of
 action being considered.

The FDA regulations, in addition to having categorical exclusions where EA's are not routinely prepared, have a list of proposed actions that ordinarily require the preparation of an EA. The item listed of most importance to this study is the requirement that a proposed action involving the disposition of FDA laboratory waste materials ordinarily requires the preparation of an EA.

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The decommissioning of buildings and/or facilities are not listed as actions in the FDA regulations subject to categorical exclusions. The exclusion in the regulation for routine maintenance and minor construction activities is not extensive enough to cover the decommissioning of a building. A phone conversation (7/28/92) with Dr. Buzz Hoffmann, FDA Environmental Impact Section indicated his belief that the decommissioning of a building was beyond the extent of the routine maintenance and minor construction activity exclusion. A phone conversation (8/24/92) with Bill Hoffman, FDA Facilities Planning, confirmed Dr. B. Hoffmann's thinking. Mr. Bill Hoffman was the project officer for the Beltsville Project EA approved in 1981 and expressed his belief that the decommissioning of FDA facilities warrant an EA. Also, he stated that at FDA an EA is generally prepared before proceeding with an EIS.

The decommissioning of facilities will require the disposal of radioactive material and possibly the disposal of mixed hazardous waste (hazardous waste with some radioactivity) and other chemical waste or hazardous waste. Since the FDA regulations state that the proposed action of disposition of FDA laboratory waste materials ordinarily requires the preparation of an EA this also indicates that completing a EA prior to the decommissioning of a building would be the appropriate course of action.

A phone conversation with Tom Cloutier, Environmental Office, Public Health Service (7/30/92) indicated his belief that if the decommissioning of a building and/or facilities were not specifically excluded from preparation of an EA, then an EA must be completed. He reinforced his belief by expressing his concern over the number of wet laboratories in the FB8 building to be handled and the disposal of not only the radioactive material but also the mixed waste and hazardous waste.

CONCLUSION

This study concludes that FDA should prepare an EA prior to decommissioning facilities since:

- · the decommissioning of facilities is not one of FDA's categorical exclusions,
- an EIS is not required by FDA regulations instead of an EA for the decommissioning of facilities, and
- the proposed action of disposition of FDA laboratory waste materials ordinarily requires the preparation of an EA and the decommissioning of facilities may entail the disposition of laboratory waste material.

It is possible that an EIS will be required for the decommissioning of some facilities. The determination for preparing an EIS can be made based on the findings of the EA. On the other hand, if the responsible FDA official establishes that significant environmental effects may be associated with the decommissioning of particular facilities the determination to perform an EIS may be made without the preparation of an EA.

PART D

August 11, 1992

300 Second St. Lauret MD 20707 Tet (301) 498-1514 Fax (301) 498-9432

The Kevric Company 8401 Colesville Rd. Suite 610 Silver Spring, MD. 20910-3363

Attn: Mr. David Allen

Re: FDA Decommissioning Funding Project

Ecology Services, Inc. (ESI) was contracted to assist the Kevric company in development of a Decommissioning Funding Plan for the Food and Drug Administration. ESI performed surveys, as outlined in the Statement of Work, of laboratory areas and facilities equipment that would directly impact decommissioning funding with regard to radioactive contamination. Surveys were began on August 3, 1992 and completed on August 6, 1992 at four (4) facilities; Federal Office Building 8 (FOB-8) 200 C St., SW. Washington, DC., Module 1 (MOD-1) Beltsville, MD., Beltsville Research Facility (BRF) Beltsville, MD. and the Center for Veterinary Medicine (CVM) located on the USDA Beltsville Agricultural Research Center reservation in Beltsville, MD.

Surveys of restricted and unrestricted laboratories were conducted by taking direct measurements using a Ludlum model 12 with a 43-68 large area gas proportional detector and a Ludlum model 3 with a 44-9 "pancake" GM detector. The survey of facility equipment included HVAC systems, fume hood exhaust systems, vacuum lines, sinks, drains and incinerators. Air handling exhaust ducts were surveyed at the point of intake into the system and discharge from the system. Incinerators were surveyed with regard to internal contamination. Masslinn techniques were instituted in an effort identify removable contamination by providing a representative sample of accessible areas. The survey did not include the collection and radioanalysis of smear samples.

A review of health physics surveys reports of radioisotope use laboratories, conducted monthly by ESI for FDA, was utilized in an effort to assess the overall FDA Radiation Safety management program.

The results of this survey are attached. Should you require additional information or clarification on any aspect of this report please feil free to contact me at 301-498-1514.

57.01

Sincerely

Finley C. Watts, Jr.

Manager, Operations

Enclosure

REPORT OF RADIATION SURVEY AND INSPECTION FOR FOOD AND DRUG ADMINISTRATION FACILITIES

Direct measurements were made using a Ludlum model 12 with a 43-68 gas proportional large area detector and a Ludlum model 3 with a 44-9 "pancake" GM detector. Instrument specifications are provide below.

L-12 w/43-68
Avg. Bkg. - 250cpm
Efficiency: 14C - 23%
Detection Limit: 74 net counts per minute
Detector surface area: 100 sq. cm.
Cal. Date: 07-31-92

L-3 w/44-9 Avg. Bkg. - 30cpm Efficiency: 14C - 11% Detection Limit: 26 net counts per minute Detector surface area: 18.5 sq. cm. Cal. Date: 07-31-92

Note: All results are recorded in gross counts per minute (gcpm) as isotopic analysis was not available. Instrument MDA can not be calculated without knowledge of the isotope(s) involved. The typical MDA value for 14- carbon using the Ludlum model 12 with a 43-68 gas proportional detector would be 322 dpm per 100 cm. sq.

Masslinn wipe techniques were performed on individual fume hood baffles to assure coverage of the entire surface. Air handling exhaust ducts, both fume hood and heating, ventilation and air conditioning (HVAC), were wiped as to cover of an area one (1) foot by one (1) foot. Masslinn wipes were monitored for radioactivity using the Ludlum model 12 with a 43-68 gas proportional detector. These samples will be archived should a more detailed radioanalysis be required.

August 3, 1992

Federal Office Building 8

The air handling system exhaust ducts were surveyed. A total of eight (8) air handling ducts, four (4) HVAC and fume hood exhaust ducts were surveyed and Massling wipes taken. The incinerator stack was also surveyed and a Massling wipe taken. The meter survey and Massling wipes revealed no detectable radiation above instrument background. The roof drainage system was surveyed to a depth of six (6) inches. The instrument survey revealed no detectable radioactivity above instrument background.

The animal cage washing area was surveyed including floor drains, HVAC exhaust ducts and flooring using the Ludlum model 12 with a 43-68. The survey revealed no detectable radiation above instrument background. A liquid injector system consisting of a funnel and an estimated eight (8) feet of pipe were found to be contaminated (1,000 gcpm/18.5 sq.cm. beta).

The incinerator and incinerator room was surveyed using the Ludlum model 12 with a 43-68 detector and the Ludlum model 3 with a 44-9 detector. No internal or external contamination of the incinerator was found. An area of concrete flooring, directly beneath where the exhaust stack changes direction from horizontal to vertical, was found to be contaminated (500 gcpm/18.5 sq.cm. beta).

August 4, 1992

Federal Office Building 8

A total of thirty (30) laboratories/cold rooms were surveyed. Areas surveyed within each lab included the HVAC exhaust, vacuum line fixtures, fume hood exhaust baffles, sinks, floor drains and cooling systems in the walk-in cold rooms and freezers. The results of the survey are attached.

August 5, 1992

Module 1

The air handling system for fume hood exhaust utilizes two (2) HEPA filter systems. The filter systems are alternated from primary to back-up on a predetermined schedule. ESI was allowed to access to the back-up unit only. The system intake ducting was surveyed using a Ludlum model 3 with a 44-9 detector. A Masslinn wipe was taken of the interior duct surface. The results of the survey show no measurable radioactivity above instrument background.

No laboratory areas were surveyed due to the fact that only limited research has been conducted using radioisotopes. Laboratories have only begun radioisotope work within the past six (6) months.

August 5, 1992 (continued)

Beltsville Research Facility

All air handling and exhaust ducting systems were surveyed using a Ludlum model 3 with a 44-9 detector. A Masslinn wipe was taken of the interior ducts surfaces. The results of the survey showed no detectable radioactivity above instrument background.

The incinerator (located on the loading dock) and surrounding area were surveyed using the Ludlum model 12 with a 43-68 detector and the Ludlum model 3 with a 44-9 detector. A Masslinn wipe was taken of the incinerator interior. No internal or external contamination of the incinerator was found.

A total of twenty (20) vivarium floor drains were surveyed throughout the complex. No detectable radioactivity was measured above instrument background.

A total of five (5) laboratories, two (2) cold rooms and the break room area were surveyed. See attached listing of laboratory survey results.

August 6, 1992

Center for Veterinary Medicine

All exhaust ducts were surveyed using a Ludlum model 3 with a 44-9 detector. A Masslinn wipe was taken of the interior ducts surfaces. No detectable radioactivity was measured above instrument background.

The incinerators, two (2) each, and surrounding concrete slabs was surveyed using the Ludlum model 3 with a 44-9 detector. A Masslinn wipe was taken of the incinerators' interior. No internal or external contamination of the incinerators was found.

A survey was conducted of an old manure compost pile. Direct measurement of the soil was performed within a twenty (20) x twenty (20) yard area, using a Ludlum model 3 with a 44-9 detector. The average measurable radiation level was found to be 150gcpm/18.5 sq.cm.

A total of seven (7) laboratories/buildings were surveyed. See attached listing of laboratory survey results.

RESULTS OF LABORATORY SURVEY

Federal Office Building 8

The second second				
Rm.Nr.	Type of Lab	Current Status	Areas Surveyed	Results/Comments
6872	Unrestricted Laboratory	Occupied	Sink HVAC exhaust Vacuum lines Hood exhaust	Negative
6414	Unrestricted Animal room	Unoccupied	Sink Bidet Vacuum lines HVAC exhaust	Negative
6426	Unrestricted Animal room	Unoccupied	Sink Vacum lines	Negative
6331	Unrestricted Cold room	Occupied	Sink Cooling unit	Negative
6046	Unrestricted Laboratory	Unoccupied	Sink HVAC exhaust Vacuum lines Hood exhaust	Negative
6034	Unrestricted Laboratory	Unoccupied	Sink HVAC exhaust Vacuum lines Hood exhaust	Possible 3H contamination LSV std., 3H found broken on fume hood base.
5880	Unrestricted Laboratory	Unoccupied	Sink HVAC exhaust Vacuum lines Hood exhaust	Negative
5884	Unrestricted Laboratory	Unoccupied	Sink HVAC exhaust Vacuum lines Hood exhaust	Negative
5415	Unrestricted Cold room in animal area	Occupied	Cooling unit	Negative
5034	Unrestricted Laboratory	Unoccupied	Sink HVAC exhaust Vacuum lines Hood exhaust	Negative

Federal Office Building 8				
Rm.Nr.	Type of Lab (urrent Status	Areas Surveyed	Results/Comments
4884	Unrestricted Laboratory	Occupied	Sink HVAC exhaust Vacuum lines Hood exhaust	Negative
4416	Unrestricted Animal room	Occupied	Sink HVAC exhaust Vacuum lines Hood exhaust	Negative
4325	Unrestricted Cold room (2 each)	Occupied	Cooling units	Negative
4050	Unrestricted Laboratory	Occupied	Sink HVAC exhaust Vacuum lines Hood exhaust	Negative
4072	Unrestricted Laboratory	Occupied	Sink HVAC exhaust Vacuum lines Hood exhaust	Negative
3838	Restricted Laboratory (32P use)	Occupied	Sink HVAC exhaust Vacuum lines	Sink found contaminated 800 gcpm. Unable to survey hood; in use.
3884	Unrestricted Laboratory	Occupied	Sink HVAC exhaust Vacuum lines Hood exhaust	Negative
3414	Unrestricted Animal room	Occupied	Sink HVAC exhaust Vacuum lines	Negative
3030	Unrestricted Laboratory	Occupied	Sink HVAC exhaust Vacuum lines Hood exhaust	Negative
3074	Restricted Laboratory (No RAM in use)	Occupied	Sink	Negative No access to to HVAC or Vac. lines

Federal Office Building 8

Rm.Nr.	Type of Lab	Current Status	Areas Surveyed	Results/Comments
2824	Unrestricted Laboratory	Occupied	Sink HVAC exhaust Vacuum lines Hood exhaust	Negative
2468	Unrestricted Animal room and (4) cold rooms	Occupied	Sink HVAC exhaust Vacuum lines Cooling units	Negative
2432	Unrestricted Animal room	Occupied	Sink HVAC exhaust Bidet	Negative
2325A	Unrestricted Cold room	Occupied	Cooling unit	Negative
2325B	Unrestricted Cold room	Occupied	Cooling unit	Negative
2062	Unrestricted Laboratory	Occupied	Sink HVAC exhaust Vacuum lines Hood exhaust	Negative
1868	Unrestricted Laboratory	Unoccupied	Sink HVAC exhaust Vacuum lines Hood exhaust	Negative
1872	Unrestricted Laboratory	Unoccupied	Sink HVAC exhaust Vacuum lines Hood exhaust	Negative
1426	Unrestricted Cold room in animal area	Occupied	Cooling unit Sink	Negative
1016	Unrestricted Laboratory	Unoccupied	Sink HVAC exhaust Vacuum lines Hood exhaust	Negative

Beltsville Research Facility

Rm.Nr.	Type of Lab	Current Status	Areas Surveyed	Results/Comments
Break room	N/A	Occupied	Sink Floor	Negative
Walk-in Cold rm (2)	Restricted .	Occupied	Floor Cooling unit	Negative
14	Restricted Laboratory (3H,14C)	Occupied	Sink HVAC exhaust Vacuum lines Hood exhaust	Negative
18	Unrestricted Laboratory	Occupied	Sink HVAC exhaust Vacuum lines Hood exhaust	Negative
CDER (no room nr.)	Restricted Laboratory (3H,14C)	Occupied	Sink HVAC exhaust Hood exhaust	Negative

ESI

Center for Veterinary Medicine

Bldg.	Type of Lab	Current Status	Areas Surveyed	Results/Comments
357	Unrestricted Laboratory	Occupied	Sink Hood exhaust Toilet	Negative
344	Unrestricted Barn	Unoccupied	Fl∞r Fl∞r drains	Negative
339-D	Unrestricted Holding Pens/ Laboratory	Unoccupied	Floor Sink Floor drains	Negative
328	Restricted Laboratory (3H)	Occupied	Hood exhaust Sink Toilet	Negative
339-F	Unrestricted Laboratory	Occupied	Hood exhaust (Sinks removed a part of renovati	ıs
337	Unrestricted Laboratory	Occupied	Floor drains Hood exhaust HVAC unit Sink	Negative
338	Restricted Laboratory (3H,125I)	Occupied	Sirk Floor drains Hood exhaust HVAC exhaust	Meter readings flux. btwn. bkg. and 250 gcpm in sink possible contamination

REVIEW OF MONTHLY HEALTH PHYSICS SURVEYS

A review of monthly health physics surveys provide the following record of each laboratories contamination history with regard to facility systems. This is a list of potential areas of concern with regard to decommissioning.

Bldg.	Lab	Areas	Isotope(s)	Comments
FOB-8	6446	Sink	3H,14C,U-nat. 32P, 35S	Dedicated Radiation Safety disposal sink.
-JE8	6082	Sink	U-nat.	Unrestricted laboratory.
FUx -8	5772	Hood Benches Floor Sink	14C	Decon in progress, hood ducting and sink drains will most likely not be decontaminated.
FOB-8	5760	Hood Benches Floor Sink	14C	Decon in progress, hood ducting and sink drains will most likely not be decontaminated.
FOB-8	4430	Glove boxes	14C	Glove box used in 14C labelled Dioxin studies, possible contamination.
FOB-8	3830	Sink	U-nat.	Unrestricted laboratory.
FOB-8	3838	Water handle and electric outlet	99Tc	Lab used in 99Tc studies prior to use with 32P. Current radioisotope use prevents completion of adequate survey with regard to the extent of 99Tc contamination.
MOD-1	2313	Hood base	3H	Identified during 7/92 HP survey; 500dpm/100cm.sq isotope ID; Tritium
BRF	14	Sink	3H/14C	Identified 3H contam. 7/92 HP survey; 515dpm/100cm.sq 14C contamin. documented on previous surveys.

PART E

All Other Survey Results

Ecology Services, Inc. made a number of radiological survey measurements in addition to those reported in Part D of this document. The information developed from these surveys has been utilized for guidance in preparing the Decommissioning Funding Plan and the Preliminary Decommissioning Plan. These survey results are not presented in this document as, at the request of the FDA Contract Administrator, these surveys were conducted under another FDA contract.

BET	WEEN:		: INFORMATION FROM LTS
	ENSE FEE MANAGEMENT BRANCH, AND IONAL LICENSING SECTIONS	ARM	PROGRAM CODE: 03610 STATUS CODE: 2 FEE CATEGORY: EX 3L EXP. DATE: 19921231 FEE COMMENTS: V DECOM FIN ASSUR REQU: Y
LIC	ENSE FEE TRANSMITTAL		
۵.	REGION I		
	APPLICATION ATTACHED APPLICANT/LICENSEE: HEALTH RECEIVED DATE: 921123 DOCKET NO: 30039 CONTROL NO.: 116499 LICENSE NO.: 08-004 ACTION TYPE: AMENDM	17 82-03	SERVICES, DEPT. OF
2 .	FEE ATTACHED AMDUNT: CHECK NO.:		
3.	COMMENTS		
		SIGNED	M. a. Per Ains
3.	LICENSE FEE MANAGEMENT BRANC	H (CHECK	WHEN MILESTONE 03 IS ENTERED //)
1 -	FEE CATEGORY AND AMOUNT:	-	
2.	CORRECT FEE PAID. APPLICAT AMENDMENT RENEWAL LICENSE	ION MAY	SE PROCESSED FOR:
3 .	OTHER		
		SIGNED .	

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