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 license 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

ML 10

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

for

DRSS:RI	DRSS:RI
Everhart	Shanbaky
	mms
05/27/94	05/27/94

OFFICIAL RECORD COPY - C:\BACKUP.P1\FDA22.FA - 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!

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Food and Drug Administration
Washington DC 20204

030-03917

MS#16

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 30, 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)

116499

MAY -2 1994

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.

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

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.

Dorie Waddick
Dorie Waddick
Radiation Safety Officer

cc: James McKenna
James Trickett
Janice Oliver
Michael Terpilak
Naresh Chawla

SEP 21 REC'D (10)

ATTACHMENT A

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
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

Edward J. Van Loon, Ph.D.
Chief/SPAL

cc: BF-158

EJVanLoon:gr 9/20/71

ATTACHMENT B

APPENDIX B

ISOTOPE COMMITTEE APPROVAL REQUEST ___________

DATE February 22, 1972

Dr. P.D. La Fleur/N.B.S.
Dr. E.J. Van Loon/S.P.A.L.
1. Dr. E. Miller/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 autopsies 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 freeze-dried specimens.

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.

2. The following quantities of radioactive material are estimated to be involved:

Isotope	Curies	Form	Curies/Gram
^{203}Hg	10 mC (max.)	Methyl Mercury Chloride	1 uC/ugm
(Isotope furnished by NBS)			

3. ______________ mrem maximum permitted at time of removal from facility supplying source.

4. Radiation dose rate evaluation will be ______________

5. Doses incurred by personnel will be determined by survey meter

6. Exposure of other persons will be prevented by standard isotope handling techniques.

7. The transmission of contamination will be prevented by isolation of test animals.

8. This operation is scheduled to begin on or about 3/1/72 and will be carried out ~~in~~ at SPAL - Counting tissues at NPS.
(Facility)

9. Upon receipt of the radioactive material to be utilized for the above purpose, ~~I~~ (We) shall be responsible to prevent the exposure of any individual to the radiation therefrom in excess of permissible limits. ~~I~~ (We) have read, are familiar with and will comply with Title 10, Part 20 Code of Federal Regulations (Standards for Protection Against Radiation) and the FDA Radiological Safety Guide.

E J Van Loon
Principal Investigator

Eugene M. Miller

Endorsement I ______________________
(Division Director)

Endorsement II John B. Huff
(Health Physicist)
28 Feb 1972

Possession and use of radioactive material as described above until ______________ is approved by the Isotope Committee.
(Expiration Date)

Approval ______________________
(Radiological Safety Officer)

This request is restricted( ), disapproved( ), for the following reasons:

[illegible]

ATTACHMENT

5. The data generated will allow: (a) MMC 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 MMC 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.

APPENDIX B

ISOTOPE COMMITTEE APPROVAL REQUEST ________

DATE February 22, 1972

Dr. P.D. La Fleur/N.B.S.
Dr. E.J. Van Loon/S.P.A.L.
1. Dr. E. Miller/S.P.A.L. proposes to:
Principal Investigator

1. Administer tagged methyl mercuric chloride (MMC) to weaned piglets for 10 days at a level of 25 uC per day for a total dose of 250 uC per piglet and for eight (8) experimental animals the total dose of isotope used would be 2 mC.
2. Blood samples will be obtained at frequent intervals during and after isotope administration.
3. Animals will be sacrificed as follows: (a) two (2) piglets 24 hours (1 day) after last dose of tagged MMC; (b) two (2) piglets approx. 10 days after last dose of tagged MMC; (c) two (2) piglets approx. 20-30 days after last dose of tagged MMC; (d) two (2) piglets approx. 40-60 days after last dose of tagged MMC.
4. At sacrifice several tissues will be removed and sectioned so as to permit isotope analysis before and after freeze-drying. The brain and kidney will be sectioned carefully to allow tissue autoradiograms to be made on the frozen sections.

(continued on attached sheet)

2. The following quantities of radioactive material are estimated to be involved:

Isotope	Curies	Form	Curies/Gram
^{203}Hg	2mC	Methyl Mercury Chloride	1 uC/ugm
	(Isotope furnished by NBS)		

A record will be kept of the amounts and dates of nuclides transferred between NBS and FDA. The FDA Health Phisist will receive a copy of this record

3. ________ mrem maximum permitted at time of removal from facility supplying source.

4. Radiation dose rate evaluation will be ________

5. Doses incurred by personnel will be determined by survey meter

6. Exposure of other persons will be prevented by standard isotope handling techniques.

7. [illegible]on of contamination will be prevented by isolation of test animals.

8. The operation is scheduled to begin on or about 3/1/72 and will be carried out xx at SPAL - Counting tissues at NBS.

9. Upon rece[illegible]aterial to be utilized for the above purpose, [illegible] (We) shall be responsible to prevent the exposure of any individual to [illegible] radiation therefrom in excess of permissible limits. XX (We) have read, [illegible] with and will comply with Title 10, Part 20 Code of Federal Regulations (Standards for Protection Against Radiation), and the FDA Radiological Safety Guide.

Principal Investigator

Eugene Miller

Endorsement I ______________________ (Division Director)

Endorsement II John B Huff (Health Physicist)
28 Feb 1972

Possession and use of radioactive material as described above until ______________________ (Expiration Date) is approved by the Isotope Committee.

Approval ______________________ (Radiological Safety Officer)

This request is restricted( ), disapproved( ), for the following reasons:

Signed ______________________ (Radiological Safety Officer)

April 24, 1972

Division of Materials Licensing
U.S. Atomic Energy Commission
Washington, D.C. 20545
Attn: R. E. Brinkman

Gentlemen:

Please amend 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 NBS to our facilities for analysis.

Thank you for your attention to this request.

Very truly yours

E. O. Haenni, Ph.D.
Chairman, Radiation Safety Committee

OK
[illegible]
4/24/72

cc: BF-10
BF-14 (2)

JBHUFF:jjs

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 1968 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

W. Scott Delicate
Project manager

Judith A Glazener

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 Byproduct Material License

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

1. (b) I. FB-8, 200 C Street, S. W. Washington, D. C. 20204
II. 501 First Street, S. E., Washington, D. C. 20204
III. South USDA Building, 12th Street and Independence Avenue,
N. W., Washington, D. C. 20204
IV. FDA Special Pharmaceutical Animal Laboratory (SPAL),
Agricultural Research Station, Beltsville, Maryland 20204

8.-9. As per the Food and Drug Administration "Guide for Radiological Safety," individual users of byproduct material will be approved by the Radioisotope Committee or its authorized representative. Facilities 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 O. Haenni, Chairman
Mr. Robert E. Simpson, Radiation Safety Officer
Mrs. Patricia D. Roecklein, Health Physicist
Mr. Joseph P. F. Lambert, Nuclear Engineer
Mr. Ralph Craig, FDA Safety Officer and representative of the
Office of the Commissioner
Mr. Leonard A. Ford, Radiochemist

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 resumé 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 resumés 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.

ATTACHMENT E

RM AEC-374
(7-69)
10 CFR 30

U. S. ATOMIC ENERGY COMMISSION
BYPRODUCT MATERIAL LICENSE

License No.
Page 1 of 3

Amendment 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 C Street, S.W.
Washington, D. C. 20204

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 radioactivity which licensee may possess at any one time
A. Any byproduct material between Atomic Nos. 3 and 83, inclusive	A. Any	A. Not to exceed 200 millicuries of each radionuclide
B. Hydrogen 3	B. Any	B. 10 curies total
C. Americium 241	C. Any	C. 100 millicuries total

9. 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.

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License Number 08-00482-03

CONDITIONS

Amendment No. 29

(Continued)

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.

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FORM AEC-374A
(2-65)

U. S. ATOMIC ENERGY COMMISSI
BYPRODUCT MATERIAL LICEN

Supplementary Sheet

Page 3 of 3 Pages

License Number 08-00482-03

CONDITIONS

(Continued)

Amendment No. 29

14. 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 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

Date JUN 13 1969

by Isotopes Branch
Division of Materials Licensing
Washington, D. C. 20545

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ORM AEC-374
(7-66)
10 CFR 30

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U. S. ATOMIC ENERGY COMMISSION
BYPRODUCT MATERIAL LICENSE

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

Amendment No. 26

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)	7. Chemical and/or physical form	8. Maximum amount of radioactivity which licensee may possess at any one time
A. Any byproduct material between Atomic Nos. 1 and 83, inclusive	A. Any	A. Not to exceed 200 millicuries of each radionuclide, except; Hydrogen 3 - 1 curie

9. Authorized use

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. Byproduct material shall be used by, or under the supervision of, individuals designated by the licensee's isotopes committee.

3 7

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.

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S. ATOMIC ENERGY COMMISSI
YPRODUCT MATERIAL LICENSE
Supplementary Sheet

Page 3 of 3 Pages

License Number 08-00482-03

Amendment No. 26

tinued)

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 §§ 73.391 - 73.395, 49 CFR Part 73, "Regulations Applying to Shippers", and §§ 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

Robert E. Brinkman

Date MAR 27 1967

by Isotopes Branch
Division of Materials Licensing
Washington, D. C. 20545

TELEPHONE CONVERSATION LOG

DATE: April 22, 1994

PERSON CALLED: Dorie Waddick, RSO	ORGANIZATION: U.S.FDA-CFSAN	TELEPHONE NUMBER: (202) 205-5393
LICENSE NUMBER: 08-00482-03	DOCKET NUMBER: 030-03917	MAIL CONTROL NUMBER: 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: Review of findings regarding possible "dumping" of radioactive waste at the Beltsville Research Facility (BRF).

SUMMARY:

Ms. Waddick spoke with several researchers who may have worked with RAM at the BRF during the late 60's and early 70's who may have some knowledge of the possibility of illegal dumping if it had occurred. She said that she would send a report to the Region when it is complete.

ACTION REQUIRED/TAKEN:

Wait for report

SIGNATURE:

DATE:

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Food and Drug Administration
Rockville MD 20857

Partial Response
030-03917

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

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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,

Sharon Smith Holston

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

ENCLOSURE A

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 MDE 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 chemical 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

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*** 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).**

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.

<u>MDE Concern #3:</u>

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.

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

ENCLOSURE A
ATTACHMENT 1

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Food and Drug Administration
Washington DC 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. 08-00482-03
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

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

ENCLOSURE B

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

FEBRUARY 1994

TABLE OF CONTENTS

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:

I. *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 procedures 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.**

2. **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.

2. Decay-in-storage for short half-life isotope materials.

3. Waste minimization efforts to separate and identify contaminated from non-contaminated components.

4. 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.

5. 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.

7. 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.

2. Decay-in-storage for short half-life isotope materials.

3. Waste minimization efforts to separate and identify contaminated from non-contaminated 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 waste minimization training program **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 limited personnel in restricted areas (RAs). 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 specifc 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

1. *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 AMOUNT (CU.FT.) OF FDA DRY SOLID WASTE THROUGH 1999:										1,095

TABLE 1*

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

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.

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 Currently Being Stored:			~ 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

1. The State of Pennsylvania is scheduled to open a disposal site for all Appalachian Compact generators in 1999.

2. 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 ^{3}H, 0.386 mCi ^{14}C (Full)
    - 0.001 mCi ^{3}H, 0.001 mCi ^{14}C (Not Full)
- Sealed Sources
    - 10 mCi ^{3}H (1)
    - 15 mCi ^{63}Ni (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 ^{3}H, 0.087 mCi ^{14}C (Full)
    - 0.800 mCi ^{3}H, 0.576 mCi ^{14}C (Full)
    - 0.075 mCi ^{3}H, 0.125 mCi ^{14}C (Full)
    - 0.800 mCi ^{3}H, 0.173 mCi ^{14}C (Full)

  - 0.005 mCi ^{14}C (Not Full)
  - 0.78 mCi ^{32}P, 0.09 mCi ^{35}S, 0.001 mCi ^{125}I (Full - Decay-in-Storage)
  - 0.65 mCi ^{32}P, 1.12 mCi ^{35}S (Full - Decay-in-Storage)
- Sealed Source
  - 15 mCi ^{63}Ni (1)
- LS Vials - 1 Drum
  - 0.001 mCi ^{3}H, 0.001 mCi ^{14}C (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, ^{3}H, ^{14}C
  - 4 liters of Methanol, Chloroform, ^{14}C
  - 8 liters of 95% Ethanol, 5% Ammonium Formate, ^{14}C
  - 3 liters of 5% Trichloracetic Acid, 95% Water or Buffer, ^{3}H, ^{14}C
  - 50 mL of 95% Ethanol, 5% Caffeine Methyl, ^{3}H
  - 4 liters of 20% Ethanol, 15% Chloroform, 15% Phenol, 50% Water, ^{3}H, ^{14}C
  - 4 liters of 20% Ethanol, 15% Chloroform, 15% Phenol, 1% Sodium Hydroxide (1N), 49% Water, ^{3}H

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.

<u>Center for Drug Evaluation and Research (CDER) - 5516 Nicholson Lane</u>

The interim LLRW storage area is a laboratory room (Room 307) approximately 85.5 ft^2 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 ^{3}H (1/4 Full)
    - 0.011 mCi ^{125}I (2 1/4 Full - Decay-in-Storage)
    - 5.0 mCi ^{51}Cr (1/2 Full - Decay-in-Storage)
- LS Vials - 1 Drum
    - 0.023 mCi ^{3}H (1/4 Full)
- Aqueous Liquids
    - 1.01 mCi ^{3}H - 7 Liters
    - 0.501 mCi ^{125}I - 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 ft^2 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 ^{3}H, 0.1 mCi ^{14}C (3 Full Drums)
- LS Vials - 1 Drum
  - 0.02 mCi ^{3}H, 0.05 mCi ^{14}C
- Bulk LS Liquids - 27 Gallons
  - 0.40 mCi ^{3}H, 0.57 mCi ^{14}C

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 ^{3}H (2 Full Drums)
  - 0.5 mCi ^{35}S (2 Full Drums - Decay-in-Storage)
  - 0.4 mCi ^{32}P (2 Full and 1 Partial Drum - Decay-in-Storage)
  - 0.06 mCi ^{45}Ca (1 Partial Drum)
- LS Vials - 1700 Vials
  - 0.002 mCi ^{3}H (300 Vials)
  - 0.01 mCi ^{32}P (500 Vials)
  - 0.1 mCi ^{35}S (900 Vials)
- Aqueous Liquids - 75 Gallons
  - 50 mCi ^{35}S (34 Gallons - Decay-in-Storage and Awaiting Sewer Disposal)
  - 30 mCi ^{32}P (30 Gallons - Decay-in-Storage and Awaiting Sewer Disposal)
  - 0.8 mCi ^{3}H (10 Gallons Awaiting Sewer Disposal)
  - 1 mCi ^{45}Ca (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.

2. 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.

4. 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.

2. 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

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

H. FINANCIAL ASSURANCE

1. 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

1. 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.

116499

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:

1. *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.

2. *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

1. Since there is an available and currently used disposal option for LS vials and bulk LS media, FDA will continue to generate such wastes.

2. The FDA is arranging for the disposal of mixed wastes other than LS vials and bulk LS liquids at DSSI.

3. **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.

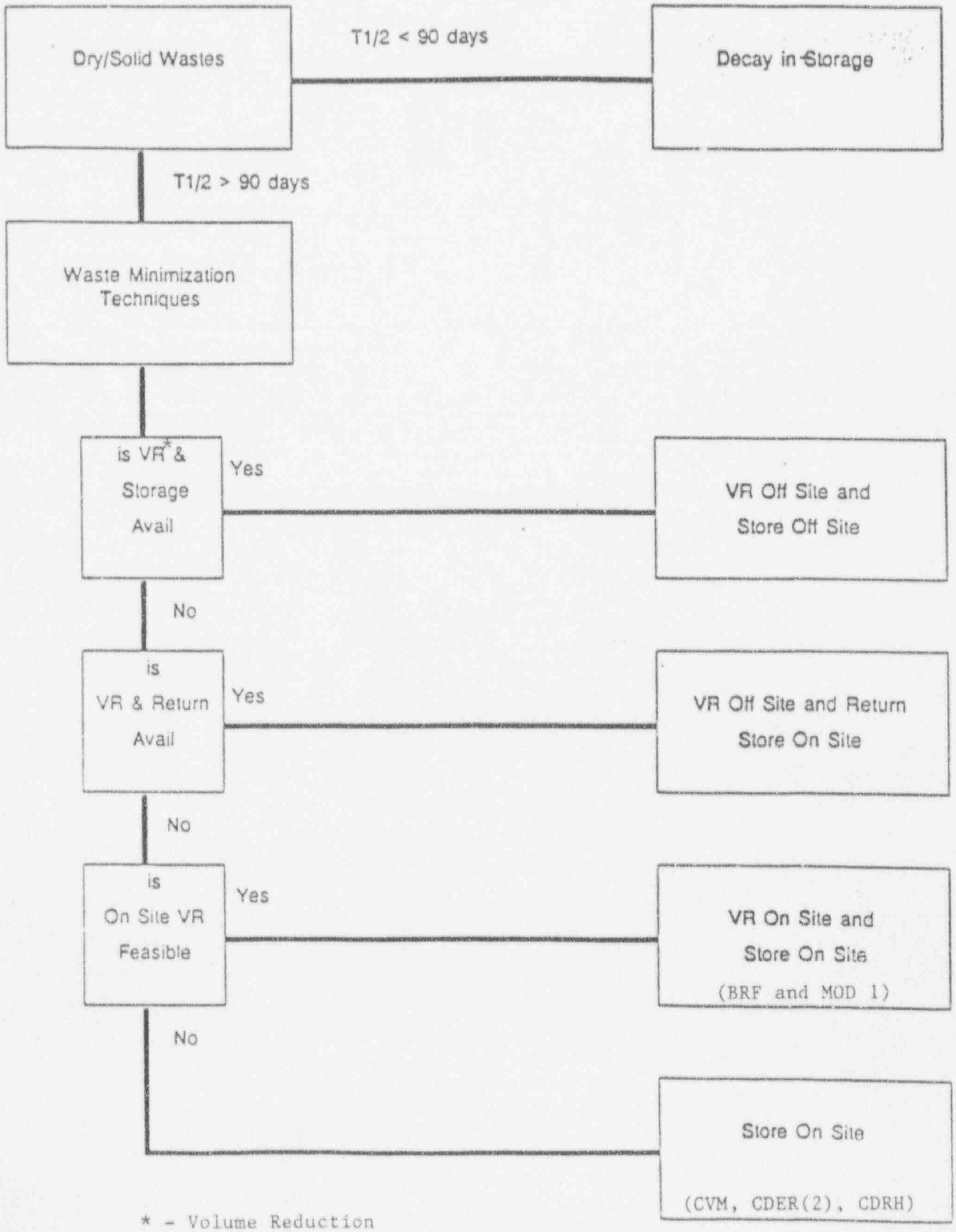
Note that the basic unit for waste management functions will be the Radioactive Waste Team which is comprised of, at a minimum, a RWT, a SRWT, and a HPT. Such a team is staffed to provide both labor, expertise, and health and safety capabilities so that it can operate independently to perform routine 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

ENCLOSURE B
ATTACHMENT 1A

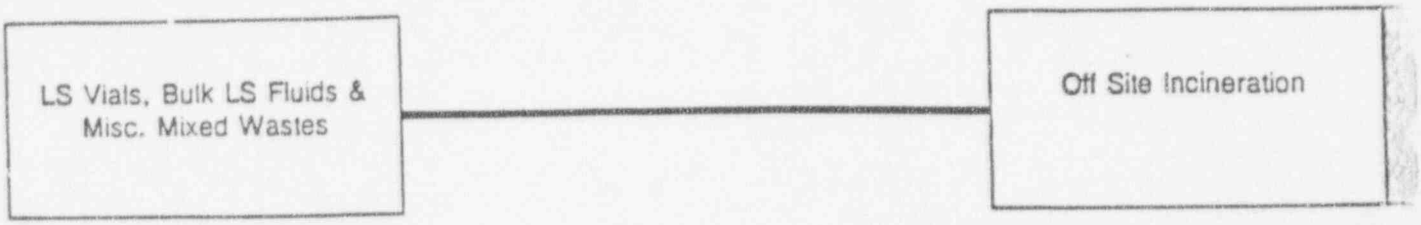
WASTE PROCESS FLOW DIAGRAM
FOR
DRY / SOLID WASTES



* - Volume Reduction

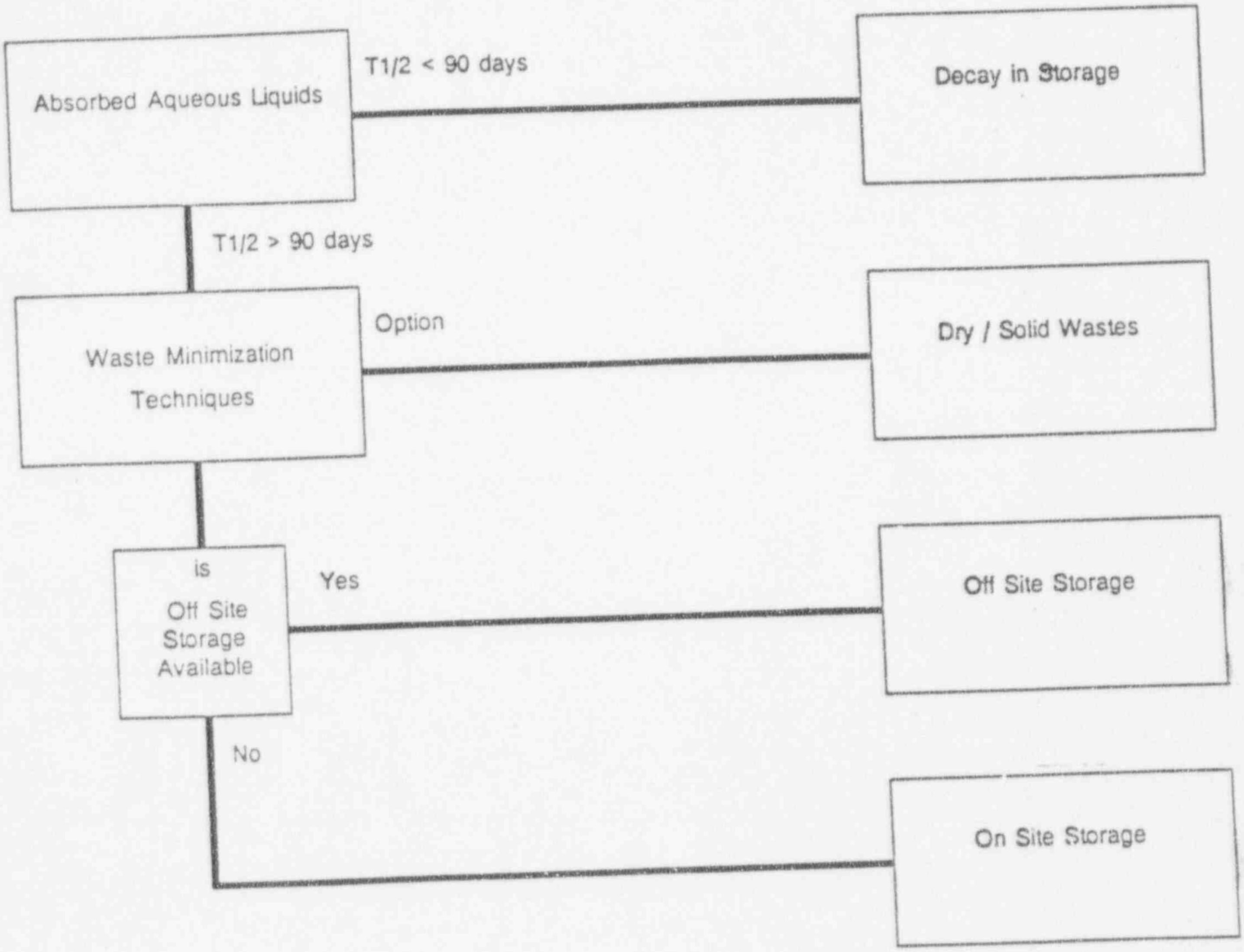
ENCLOSURE B
ATTAHMENT 1B

WASTE PROCESS FLOW DIAGRAM
FOR
OTHER WASTE FORMS



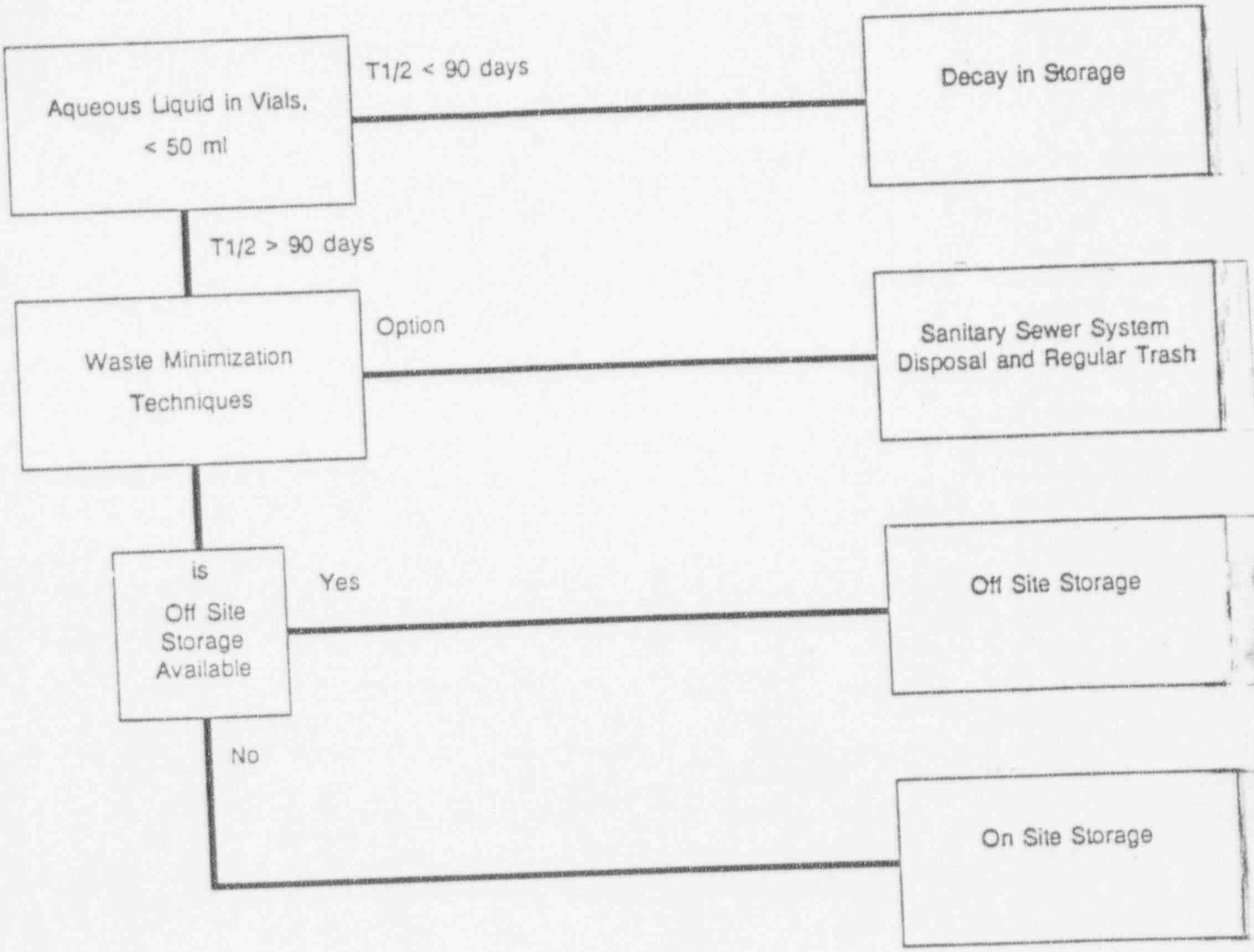
ENCLOSURE B
ATTACHMENT 1C

WASTE PROCESS FLOW DIAGRAM
FOR
ABSORBED AQUEOUS LIQUIDS



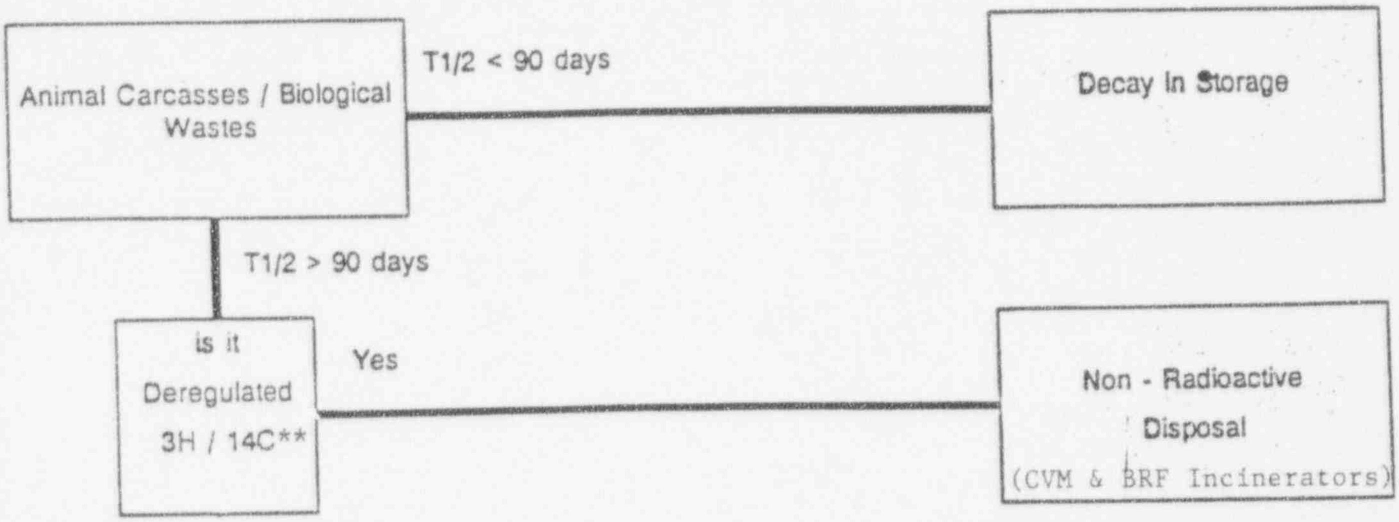
ENCLOSURE B
ATTACHMENT 1D

WASTE PROCESS FLOW DIAGRAM
FOR
AQUEOUS LIQUID IN VIALS, < 50 ml



ENCLOSURE B
ATTACHMENT 1E

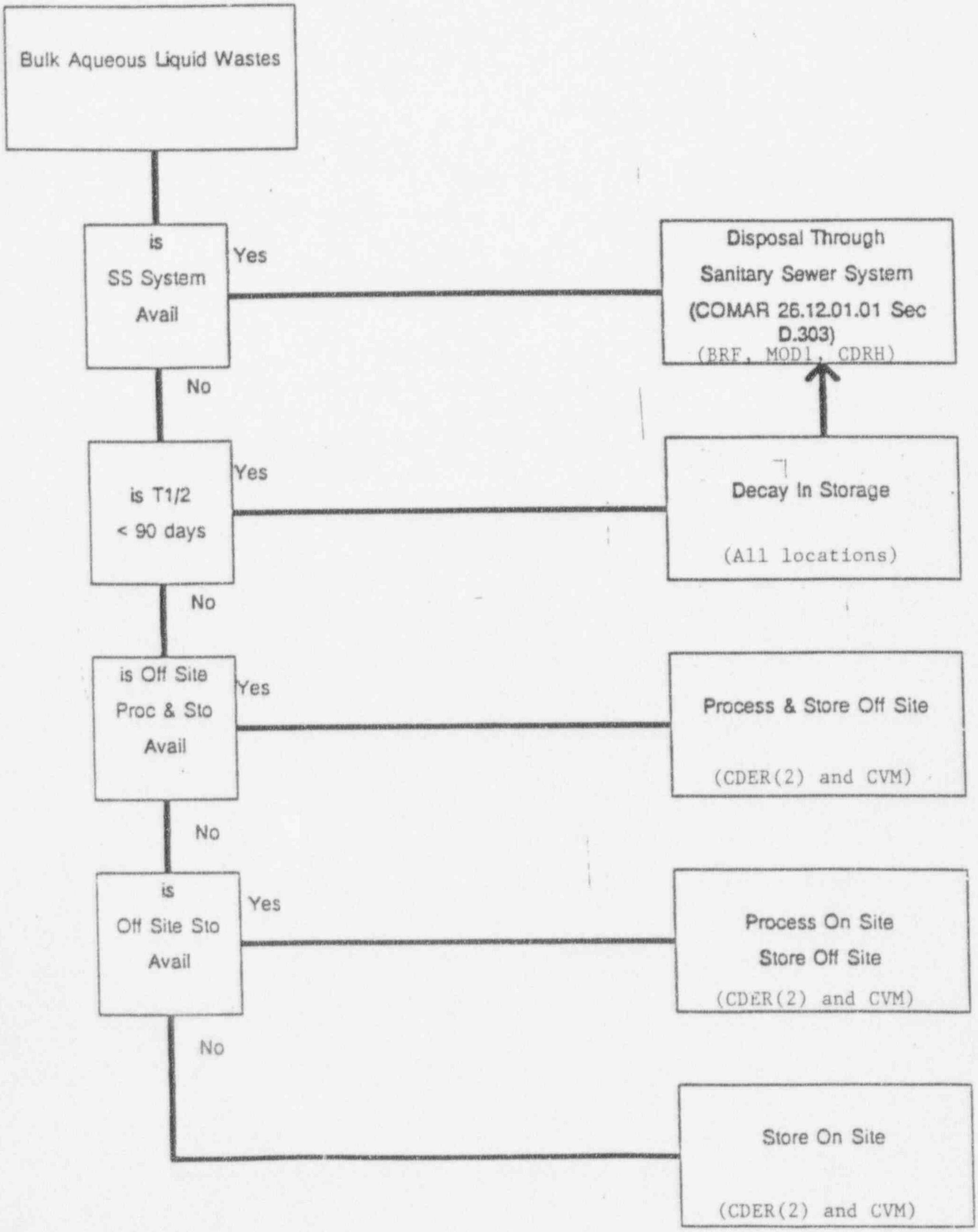
WASTE PROCESS FLOW DIAGRAM
FOR
ANIMAL CARCASSES / BIOLOGICAL WASTES



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

ENCLOSURE B
ATTACHMENT 1F

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

ENCLOSURE B — ATTACHMENT 2A

MARYLAND DEPARTMENT OF THE ENVIRONMENT

ANNUAL LOW-LEVEL RADIOACTIVE WASTE SURVEY -

The Maryland Department of the Environment (MDE) Hazardous 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.

Licensee Information:

Facility Name DHHS/PHS/FDA CENTER FOR FOOD SAFETY AND APPLIED NUTRITION

Address 8301 MuirKirk Road

LAUREL, MD 20708 County PRINCE GEORGES

Department/Division SAFETY MANAGEMENT BRANCH

Contact Person MICHAEL S. TERPILAK Title Certified Health PHYSICIST (CHP) FDA LLRW COORDINATOR

Phone: Area Code (301) 594-0514.

Licenses

Radioactive Materials License Numbers

NRC 08-00482-03 Broad Scope TYPE A

State MD ID # N-34-005-01

1. CHECK ONE CATEGORY WHICH BEST DESCRIBES YOUR FACILITY:

A. ( ) NUCLEAR POWER PLANT

B. ( ) OTHER NUCLEAR FUEL CYCLE

C. ( ) MEDICAL (NON-GOVERNMENT)
   - ( ) Hospital
   - ( ) Laboratory
   - ( ) Research
   - ( ) Medical College or Hospital

D. ( ) ACADEMIC
   - ( ) Research
   - ( ) Education

E. (✓) GOVERNMENT
   - ( ) Federal
   - ( ) State

F. ( ) INDUSTRIAL
   - ( ) Research & Development
   - ( ) Manufacturing
   - ( ) Decon. Facility & Waste Reduction
   - ( ) Sealed Sources/Gauges/Devices

2. If under the above license(s) radioactive waste is generated at locations other than the licensee address above, check this box and attach a list of those locations including complete addresses. ☑

3. If your answers to #4, 5(a) and 5(b) are zero, you need not complete remainder of this form. Sign below, date and return this survey.

Michael S. Terpilak
Signature of Person Completing Form

FDA LLRW COORDINATOR, CHP
Title

2-23-94
Date

Waste Inventory

4. Estimate volume of Low-Level Radioactive Waste (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 Part 61 .55 for the definitions of Class A, B, C or greater than Class C wastes.
Also, estimate the volume of Mixed Waste that you expect to have in storage as of January 1, 1993. Mixed waste refers to that radioactive waste 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 Class	Class A	Class B	Class C	Greater Than Class C	Mixed Waste	Total Volume
Volume in Cubic Feet	45.0 ft^3	—	—	—	~7 gallons	45.0 Ft^3 7 gallons

Gross Waste Volumes

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

Waste Class	1993 Cu. Ft.	1994 Cu. Ft.	1995 Cu. Ft.	Total Cubic Feet
Class A	45.0	45.0	60.0	150.0
Class B	—	—	—	—
Class C	—	—	—	—
Greater Than Class C	—	—	—	—
Total	45.0	45.0	60.0	150.0

Waste Class	1996 Cu. Ft.	1997 Cu. Ft.	1998 Cu. Ft.	Total Cubic Feet
Class A	75.0	97.5	97.5	270.0
Class B	—	—	—	—
Class C	—	—	—	—
Greater Than Class C	—	—	—	—
Total	75	97.5	97.5	270.0

Waste Class	1999 Cu. Ft.			Total Cubic Feet
Class A	97.5			97.5
Class B	—			—
Class C	—			—
Greater Than Class C	—			—
Total	97.5			97.5

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

	1993 Cu. Ft.	1994 Cu. Ft.	1995 Cu. Ft.	Total Cubic Feet
Mixed Waste	1	—	—	1

	1996 Cu. Ft.	1997 Cu. Ft.	1998 Cu. Ft.	Total Cubic Feet
Mixed Waste	—	—	—	—

	1999 Cu. Ft.			Total Cubic Feet
Mixed Waste	—			—

Volume Reduction

6. a.) Indicate On-Site Volume Reduction methods that you will utilize to reduce the volumes indicated in #5(a) and (b) above (1993 through 1998). Also indicate percent of volume reduction you expect to achieve.

Compaction 0 %

Decontamination 0 %

Incineration 0 %

Total Volume Reduction 0 %

b.) If you do not use any On-Site Volume Reduction methods now, do you intend to use or install any volume reduction systems in the future at your facility for wastes indicated in #5(a) and (b)? What systems do you intend to install?

YES - DRUM COMPACTOR

c.) Indicate any additional permits or license amendments you will require for 6(a) and (b). What is your schedule to obtain those permits or license amendments?

NRC License Amendment - AUGUST - 1995

d.) By utilizing on-site waste reduction/minimization methods, how much waste volume reduction have you achieved so far? 0 %

7. a.) Indicate any Off-Site Volume Reduction services that you will utilize to reduce the volumes indicated in #5(a) and (b) (1993 through 1998). Also indicate percent of volume reduction that you expect to achieve.

Super Compaction 0 %

Incineration 0 %

Decontamination 0 %

Total Volume Reduction 0 %

b.) 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?

NRC License Amendment - AUGUST 1995

c.) Will the Off-Site Waste Reduction Vendor ship the volume of reduced waste back to you for storage? Yes

If not, what will happen to that waste? NA

d.) By utilizing off-site waste reduction services, how much waste volume reduction have you achieved so far? 0 %

e.) What are your contingency plans should Off-Site Volume Reduction methods not be available to you?

ON SITE VOLUME Reduction

AND ON SITE STORAGE

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 VOLUMES IN CUBIC FEET			Total Cubic Feet
	1993	1994	1995	
Class A	45.0	45.0	60.0	150.0
Class B	—	—	—	—
Class C	—	—	—	—
Greater Than Class C	—	—	—	—
Mixed Waste	1.0	—	—	1.0
Total	46.0	45.0	60.0	151.0

Waste Type	NET VOLUMES IN CUBIC FEET			Total Cubic Feet
	1996	1997	1998	
Class A	95.0	97.5	97.5	270.0
Class B	—	—	—	—
Class C	—	—	—	—
Greater Than Class C	—	—	—	—
Mixed Waste	—	—	—	—
Total	95.0	97.5	97.5	270.0

Waste Type	NET VOLUMES IN CUBIC FEET			Total Cubic Feet
	1999			
Class A	97.5			97.5
Class B	—			—
Class C	—			—
Greater Than Class C	—			—
Mixed Waste	—			—
Total	97.5			97.5

116499

OFFICIAL RECORD COPY ML 10

Storage

9. a.) Will you store waste indicated in #8 <u>On-Site</u> until December 31, 1995? Yes

b.) If not, then what contingency plans do you have for that waste? FYI: pursuing OFF-SITE STORAGE with Dept. of the Army

10. a.) Indicate <u>On-Site Storage Capacity</u> you will have by January 1, 1993, for total waste volume indicated in #8.
Total Capacity 150 Cubic Feet

b.) Indicate any additional permits or license amendments you will require for <u>On-Site Storage</u> of waste until December 31, 1992.

authority to exceed NRC recommend 5 year period for holding LLRW on site, may also include License Renewal 1998

c.) What is your schedule to obtain those permits or license amendments?

License Amendment Renewal during 1998 - authority to exceed 5 year hold will be requested in 1997, when the length of the extension is accurately predicted.

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

Hazardous & Solid Waste Management Admin.
Maryland Department of the Environment
2500 Broening Highway
Baltimore, Maryland 21224
Attention: Niel Thompson

MARYLAND DEPARTMENT OF THE ENVIRONMENT

ANNUAL LOW-LEVEL RADIOACTIVE WASTE SURVEY -

The Maryland Department of the Environment (MDE) Hazardous 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.

Licensee Information:

Facility Name DHHS/PHS/FDA CENTER FOR Veterinary Center
Address Beltsville Agricultural Research Center, EAST Beltsville County Prince Georges
Department/Division OFFICE OF SCIENCE
Contact Person MICHAEL S. TERPILAK Title CERTIFIED Health PHYSICIST
Phone: Area Code (301) 594-0514

Licenses

Radioactive Materials License Numbers

NRC 08-00482-03 - BROAD SCOPE TYPE A
State MD ID# N-34-004-01

1. CHECK ONE CATEGORY WHICH BEST DESCRIBES YOUR FACILITY:

- A. ( ) NUCLEAR POWER PLANT
- B. ( ) OTHER NUCLEAR FUEL CYCLE
- C. ( ) MEDICAL (NON-GOVERNMENT)
  - ( ) Hospital
  - ( ) Laboratory
  - ( ) Research
  - ( ) Medical College or Hospital
- D. ( ) ACADEMIC
  - ( ) Research
  - ( ) Education
- E. (✓) GOVERNMENT
  - ( ) Federal
  - ( ) State
- F. ( ) INDUSTRIAL
  - ( ) Research & Development
  - ( ) Manufacturing
  - ( ) Decon. Facility & Waste Reduction
  - ( ) Sealed Sources/Gauges/Devices

2. If under the above license(s) radioactive waste is generated at locations other than the licensee address above, check this box and attach a list of those locations including complete addresses. ☑

3. If your answers to #4, 5(a) and 5(b) are zero, you need not complete remainder of this form. Sign below, date and return this survey.

Michael S. Terpilak
Signature of Person Completing Form

FDA LLRW COORDINATOR
CHP
Title

2-23-94
Date

Volume Reduction

6. a.) Indicate On-Site Volume Reduction methods that you will utilize to reduce the volumes indicated in #5(a) and (b) above (1993 through 1998). Also indicate percent of volume reduction you expect to achieve.

Compaction 0 % Decontamination 0 %

Incineration 0 % Total Volume Reduction 0 %

b.) If you do not use any On-Site Volume Reduction methods now, do you intend to use or install any volume reduction systems in the future at your facility for wastes indicated in #5(a) and (b)? What systems do you intend to install?

NO AT CUM - None at this time

c.) Indicate any additional permits or license amendments you will require for 6(a) and (b). What is your schedule to obtain those permits or license amendments?

NA

d.) By utilizing on-site waste reduction/minimization methods, how much waste volume reduction have you achieved so far? 0 %

7. a.) Indicate any Off-Site Volume Reduction services that you will utilize to reduce the volumes indicated in #5(a) and (b) (1993 through 1998). Also indicate percent of volume reduction that you expect to achieve.

Super Compaction 0 % Incineration 0 %

Decontamination 0 % Total Volume Reduction 0 %

b.) 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?

NRC License Amendment AUGUST, 1995

c.) Will the Off-Site Waste Reduction Vendor ship the volume of reduced waste back to you for storage? Yes

If not, what will happen to that waste? NA

d.) By utilizing off-site waste reduction services, how much waste volume reduction have you achieved so far? 0 %

e.) What are your contingency plans should Off-Site Volume Reduction methods not be available to you?

On site STORAGE

Waste Inventory

4. Estimate volume of Low-Level Radioactive Waste (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 Part 61 •55 for the definitions of Class A, B, C or greater than Class C wastes.
Also, estimate the volume of Mixed Waste that you expect to have in storage as of January 1, 1993. Mixed waste refers to that radioactive waste 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 Class	Class A	Class B	Class C	Greater Than Class C	Mixed Waste	Total Volume
Volume in Cubic Feet	9.5	–	–	–	500ml	7.5 / 500ml

Gross Waste Volumes

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

Waste Class	1993 Cu. Ft.	1994 Cu. Ft.	1995 Cu. Ft.	Total Cubic Feet
Class A	7.5	15.0	22.5	45.0
Class B	–	–	–	–
Class C	–	–	–	–
Greater Than Class C	–	–	–	–
Total	7.5	15.0	22.5	45.0

Waste Class	1996 Cu. Ft.	1997 Cu. Ft.	1998 Cu. Ft.	Total Cubic Feet
Class A	30.0	45.0	45.0	120.0
Class B	–	–	–	–
Class C	–	–	–	–
Greater Than Class C	–	–	–	–
Total	30.0	45.0	45.0	120.0

Waste Class	1999 Cu. Ft.			Total Cubic Feet
Class A	45.0			45.0
Class B	–			–
Class C	–			–
Greater Than Class C	–			–
Total	45.0			45.0

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

	1993 Cu. Ft.	1994 Cu. Ft.	1995 Cu. Ft.	Total Cubic Feet
Mixed Waste	500ml	–	–	500ml

	1996 Cu. Ft.	1997 Cu. Ft.	1998 Cu. Ft.	Total Cubic Feet
Mixed Waste	–	–	–	–

	1999 Cu. Ft.			Total Cubic Feet
Mixed Waste	–	–	–	–

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 VOLUMES IN CUBIC FEET			Total Cubic Feet
	1993	1994	1995	
Class A	7.5	15.0	22.5	45.0
Class B	—	—	—	—
Class C	—	—	—	—
Greater Than Class C	—	—	—	—
Mixed Waste	500 ml	—	—	—
Total	7.5 + 500 ml	15.0	22.5	45.0

Waste Type	NET VOLUMES IN CUBIC FEET			Total Cubic Feet
	1996	1997	1998	
Class A	30.0	45.0	45.0	120.0
Class B	—	—	—	—
Class C	—	—	—	—
Greater Than Class C	—	—	—	—
Mixed Waste	—	—	—	—
Total	30.0	45.0	45.0	120.0

Waste Type	NET VOLUMES IN CUBIC FEET			Total Cubic Feet
	1999			[illegible]
Class A	45.0			45.0
Class B	—			—
Class C	—			—
Greater Than Class C	—			—
Mixed Waste	—			—
Total	45.0			45.0

Storage

9. a.) Will you store waste indicated in #8 <u>On-Site</u> until December 31, 1999? Yes

b.) If not, then what contingency plans do you have for that waste? EDA pursuing off-site storage with the U.S. Army.

10. a.) Indicate <u>On-Site Storage Capacity</u> you will have by January 1, 1993, for total waste volume indicated in #8.
Total Capacity [redacted]90 Cubic Feet

b.) Indicate any additional permits or license amendments you will require for <u>On-Site Storage</u> of waste until December 31, 1999. authority to exceed NRC recommended 5 year period for holding Edgewood site, may also include license renewal 1998.

c.) What is your schedule to obtain those permits or license amendments? License amendment & renewal during 1998, Authority to exceed 5 year hold will be requested in 1997 when the length of the extension is accurately predicted.

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

Hazardous & Solid Waste Management Admin.
Maryland Department of the Environment
2500 Broening Highway
Baltimore, Maryland 21224
Attention: Niel Thompson

ENCLOSURE B - ATTACHMENT 2B

MARYLAND DEPARTMENT OF THE ENVIRONMENT

ANNUAL LOW-LEVEL RADIOACTIVE WASTE SURVEY -

The Maryland Department of the Environment (MDE) Hazardous and Solid Waste Management (HSWMA) <u>needs your assistance</u> 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.

Licensee information:

Facility Name FDA Antiviral Research Laboratory, Division Antiviral Drug Products

Address 5516 Nicholson Lane Suite 300 Kensington, MD

County Montgomery

Department/Division Antiviral Drug Products

Contact Person Michael Ussery Ph.D. **Title** RSO, Laboratory Director

Phone: Area Code (301) 594-6259

Licenses

Radioactive Materials License Numbers

NRC 19-07538-06

State

1. CHECK <u>ONE</u> CATEGORY WHICH BEST DESCRIBES YOUR FACILITY:

A. ( ) NUCLEAR POWER PLANT

B. ( ) OTHER NUCLEAR FUEL CYCLE

C. ( ) MEDICAL (NON-GOVERNMENT)
( ) Hospital
( ) Laboratory
( ) Research
( ) Medical College or Hospital

D. ( ) ACADEMIC
( ) Research
( ) Education

E. (✓) GOVERNMENT
(✓) Federal
( ) State

F. ( ) INDUSTRIAL
( ) Research & Development
( ) Manufacturing
( ) Decon. Facility & Waste Reduction
( ) Sealed Sources/Gauges/Devices

2. If under the above license(s) radioactive waste is generated at locations other than the licensee address above, check this box and attach a list of those locations including complete addresses. ☐

3. If your answers to #4, 5(a) and 5(b) are zero, you need not complete remainder of this form. Sign below, date and return this survey.

Michael A. Ussery — Signature of Person Completing Form

RSO, LABORATORY Director — Title

2/8/94 — Date

Waste Inventory

4. Estimate volume of Low-Level Radioactive Waste (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 Part 61.55 for the definitions of Class A, B, C or greater than Class C wastes.
Also, estimate the volume of Mixed Waste that you expect to have in storage as of January 1, 1993. Mixed waste refers to that radioactive waste 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 Class	Class A	Class B	Class C	Greater Than Class C	Mixed Waste	Total Volume
Volume in Cubic Feet	15.0	0	0	0	0	15.0

Gross Waste Volumes

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

Waste Class	1993 Cu. Ft.	1994 Cu. Ft.	1995 Cu. Ft.	Total Cubic Feet
Class A	15.0	15.0	15.0	45.0
Class B	0	0	0	0
Class C	0	0	0	0
Greater Than Class C	0	0	0	0
Total	15.0	15.0	15.0	45.0

Waste Class	1996 Cu. Ft.	1997 Cu. Ft.	1998 Cu. Ft.	Total Cubic Feet
Class A	15.0	15.0	15.0	45.0
Class B	0	0	0	0
Class C	0	0	0	0
Greater Than Class C	0	0	0	0
Total	15.0	15.0	15.0	15.0

Waste Class	1999 Cu. Ft.			Total Cubic Feet
Class A	15.0			15.0
Class B	0			0
Class C	0			0
Greater Than Class C	0			0
Total	15.0			15.0

total by 1999 105.0 ft^3

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

	1993 Cu. Ft.	1994 Cu. Ft.	1995 Cu. Ft.	Total Cubic Feet
Mixed Waste	0	0	0	0

	1996 Cu. Ft.	1997 Cu. Ft.	1998 Cu. Ft.	Total Cubic Feet
Mixed Waste	0	0	0	0

	1999 Cu. Ft.			Total Cubic Feet
Mixed Waste	0	0	0	0

Volume Reduction

6. a.) Indicate On-Site Volume Reduction methods that you will utilize to reduce the volumes indicated in #5(a) and (b) above (1993 through 1996). Also indicate percent of volume reduction you expect to achieve.

Compaction	______%	Decontamination	______%
Incineration	______%	Total Volume Reduction	______%

b.) If you do not use any On-Site Volume Reduction methods now, do you intend to use or install any volume reduction systems in the future at your facility for wastes indicated in #5(a) and (b)? What system do you intend to install?

____

c.) Indicate any additional permits or license amendments you will require for 6(a) and (b). What is your schedule to obtain those permits or license amendments?

____

d.) By utilizing on-site waste reduction/minimization methods, how much waste volume reduction have you achieved so far? __0__%

7. a.) Indicate any Off-Site Volume Reduction services that you will utilize to reduce the volumes indicated in #5(a) and (b) (1993 through 1996). Also indicate percent of volume reduction that you expect to achieve.

Super Compaction	______%	Incineration	______%
Decontamination	______%	Total Volume Reduction	______%

b.) 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?

____

c.) Will the Off-Site Waste Reduction Vendor ship the volume of reduced waste back to you for storage? ______

If not, what will happen to that waste? ______________________________

____

d.) By utilizing off-site waste reduction services, how much waste volume reduction have you achieved so far? __0__%

e.) What are your contingency plans should Off-Site Volume Reduction methods not be available to you?

____

____

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 VOLUMES IN CUBIC FEET			Total Cubic Feet
	1993	1994	1995	
Class A	15.0	15.0	15.0	45.0
Class B	—	—	—	—
Class C	—	—	—	—
Greater Than Class C	—	—	—	—
Mixed Waste	—	—	—	—
Total	15.0	15.0	15.0	45.0

Waste Type	NET VOLUMES IN CUBIC FEET			Total Cubic Feet
	1996	1997	1998	
Class A	15.0	15.0	15.0	45.0
Class B	—	—	—	—
Class C	—	—	—	—
Greater Than Class C	—	—	—	—
Mixed Waste	—	—	—	—
Total	15.0	15.0	15.0	45.0

Waste Type	NET VOLUMES IN CUBIC FEET			Total Cubic Feet
	1999			
Class A	15.0	—	-	15.0
Class B	—			—
Class C	—			—
Greater Than Class C	—			—
Mixed Waste	—			—
Total	15.0			15.0

Storage

9. a.) Will you store waste indicated in #8 Onsite until December 31, 1993? yes

b.) If not, then what contingency plans do you have for that waste? ______

10. a.) Indicate Onsite Storage Capacity you will have by January 1, 1993, for total waste volume indicated in #8.
Total Capacity 100 Cubic Feet

b.) Indicate any additional permits or license amendments you will require for On-Site Storage of waste until December 31, 1993.
will amend license for dedicated storage facility

c.) What is your schedule to obtain those permits or license amendments?
Immediately upon completion of facility by FDA Facilities

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

Hazardous & Solid Waste Management Admin.
Maryland Department of the Environment
2500 Broening Highway
Baltimore, Maryland 21224
Attention: Niel Thompson

ENCLOSURE B - ATTACHMENT 2C

MARYLAND DEPARTMENT OF THE ENVIRONMENT

ANNUAL LOW-LEVEL RADIOACTIVE WASTE SURVEY -

The Maryland Department of the Environment (MDE) Hazardous 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.

Licensee Information:

Facility Name U.S. FDA, Center for Drug Evaluation and Research
Address 4 Research Court,
Rockville Md County Montgomery
Department/Division Office of Research Resources
Contact Person Edward B. Radde Title Industrial Hygienist
Phone: Area Code (301) 594-0522

Licenses

Radioactive Materials License Numbers

NRC 19-07538-05
State

1. CHECK ONE CATEGORY WHICH BEST DESCRIBES YOUR FACILITY:

A. ( ) NUCLEAR POWER PLANT

B. ( ) OTHER NUCLEAR FUEL CYCLE

C. ( ) MEDICAL (NON-GOVERNMENT)
   ( ) Hospital
   ( ) Laboratory
   ( ) Research
   ( ) Medical College or Hospital

D. ( ) ACADEMIC
   ( ) Research
   ( ) Education

E. ( ) GOVERNMENT
   (✓) Federal
   ( ) State

F. ( ) INDUSTRIAL
   ( ) Research & Development
   ( ) Manufacturing
   ( ) Decon. Facility & Waste Reduction
   ( ) Sealed Sources/Gauges/Devices

2. If under the above license(s) radioactive waste is generated at locations other than the licensee address above, check this box and attach a list of those locations including complete addresses. ☐

3. If your answers to #4, 5(a) and 5(b) are zero, you need not complete remainder of this form. Sign below, date and return this survey.

Edward B Radde Industrial Hygienist 2-10-94
Signature of Person Completing Form Title Date

Waste Inventory

4. Estimate volume of Low-Level Radioactive Waste (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 Part 61.55 for the definitions of Class A, B, C or greater than Class C wastes.
Also, estimate the volume of Mixed Waste that you expect to have in storage as of January 1, 1993. Mixed waste refers to that radioactive waste 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 Class	Class A	Class B	Class C	Greater Than Class C	Mixed Waste	Total Volume
Volume in Cubic Feet	22.5	0	0	0	0	22.5

Gross Waste Volumes

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

Waste Class	1993 Cu. Ft.	1994 Cu. Ft.	1995 Cu. Ft.	Total Cubic Feet
Class A	22.5	22.5	22.5	67.5
Class B	0	0	0	0
Class C	0	0	0	0
Greater Than Class C	0	0	0	0
Total	22.5	22.5	22.5	67.5

Waste Class	1996 Cu. Ft.	1997 Cu. Ft.	1998 Cu. Ft.	Total Cubic Feet
Class A	22.5	22.5	22.5	67.5
Class B	0	0	0	0
Class C	0	0	0	0
Greater Than Class C	0	0	0	0
Total	22.5	22.5	22.5	67.5

Waste Class	1999 Cu. Ft.			Total Cubic Feet
Class A	22.5			22.5
Class B	0			0
Class C	0			0
Greater Than Class C	0			0
Total	22.5			22.5

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

	1993 Cu. Ft.	1994 Cu. Ft.	1995 Cu. Ft.	Total Cubic Feet
Mixed Waste	0	0	0	0

	1996 Cu. Ft.	1997 Cu. Ft.	1998 Cu. Ft.	Total Cubic Feet
Mixed Waste	0	0	0	0

	1999 Cu. Ft.			Total Cubic Feet
Mixed Waste	0	0	0	0

Volume Reduction

6. a.) Indicate On-Site Volume Reduction methods that you will utilize to reduce the volumes indicated in #5(a) and (b) above (1993 through 1998). Also indicate percent of volume reduction you expect to achieve.

Compaction ________% Decontamination ________%

Incineration ________% Total Volume Reduction ________%

b.) If you do not use any On-Site Volume Reduction methods now, do you intend to use or install any volume reduction systems in the future at your facility for wastes indicated in #5(a) and (b)? What systems do you intend to install?

____

c.) Indicate any additional permits or license amendments you will require for 6(a) and (b). What is your schedule to obtain those permits or license amendments?

____

d.) By utilizing on-site waste reduction/minimization methods, how much waste volume reduction have you achieved so far? __0__%

7. a.) Indicate any Off-Site Volume Reduction services that you will utilize to reduce the volumes indicated in #5(a) and (b) (1993 through 1998). Also indicate percent of volume reduction that you expect to achieve.

Super Compaction ________% Incineration ________%

Decontamination ________% Total Volume Reduction ________%

b.) 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?

____

c.) Will the Off-Site Waste Reduction Vendor ship the volume of reduced waste back to you for storage? ______

If not, what will happen to that waste? ______________________________

____

d.) By utilizing off-site waste reduction services, how much waste volume reduction have you achieved so far? __0__%

e.) What are your contingency plans should Off-Site Volume Reduction methods not be available to you?

____

____

Net Waste Volumes

8. Subtract volumes expected to be reduced by utilizing #6(a) and/or #7(a), from #3(a) and (b). After subtraction, add waste inventory volumes from #4 to the remainders to indicate net or real volumes.

Waste Type	NET VOLUMES IN CUBIC FEET			Total Cubic Feet
	1993	1994	1995	
Class A	22.5	22.5	22.5	67.5
Class B	0	0	0	
Class C	0	0	0	
Greater Than Class C	0	0	0	
Mixed Waste	0	0	0	
Total	22.5	22.5	22.5	67.5

Waste Type	NET VOLUMES IN CUBIC FEET			Total Cubic Feet
	1996	1997	1998	
Class A	22.5	22.5	22.5	67.5
Class B	0	0	0	0
Class C	0	0	0	0
Greater Than Class C	0	0	0	0
Mixed Waste	0	0	0	0
Total	22.5	22.5	22.5	67.5

Waste Type	NET VOLUMES IN CUBIC FEET			Total Cubic Feet
	1999			
Class A	22.5			22.5
Class B	0			0
Class C	0			0
Greater Than Class C	0			0
Mixed Waste	0			0
Total	22.5			22.5

Storage

9. a.) Will you store waste indicated in #8 On-Site until December 31, 1998? NO

b.) If not, then what contingency plans do you have for that waste? By 1995 it is anticipated that the lab and waste may be moved to a new location.

10. a.) Indicate On-Site Storage Capacity you will have by January 1, 1993, for total waste volume indicated in #8.
Total Capacity 75 Cubic Feet

b.) Indicate any additional permits or license amendments you will require for On-Site Storage of waste until December 31, 1998.
An amendment and/or a new specific license may be needed to transfer waste to New location.

c.) What is your schedule to obtain these permits or license amendments?
An amendment may be requested in summer 1994.

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

Hazardous & Solid Waste Management Admin.
Maryland Department of the Environment
2500 Broening Highway
Baltimore, Maryland 21224
Attention: Niel Thompson

ENCLOSURE B- ATTACHMENT 2D

MARYLAND DEPARTMENT OF THE ENVIRONMENT

ANNUAL LOW-LEVEL RADIOACTIVE WASTE SURVEY -

The Maryland Department of the Environment (MDE) Hazardous 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.

Licensee Information:

Facility Name DHHS/PHS/FDA/Center for Devices and Radiological Health

Address 2094 Gaither Rd Rockville MD 20850

County Montgomery

Department/Division Office of Health Physics HFZ-60

Contact Person Edward A. Tupin Title Radiation Safety Officer

Phone: Area Code (301) 594-4752

Licenses

Radioactive Materials License Numbers

NRC 19-07583-01

State

1. CHECK ONE CATEGORY WHICH BEST DESCRIBES YOUR FACILITY:

A. ( ) NUCLEAR POWER PLANT

B. ( ) OTHER NUCLEAR FUEL CYCLE

C. ( ) MEDICAL (NON-GOVERNMENT)
  - ( ) Hospital
  - ( ) Laboratory
  - ( ) Research
  - ( ) Medical College or Hospital

D. ( ) ACADEMIC
  - ( ) Research
  - ( ) Education

E. (✓) GOVERNMENT
  - (✓) Federal
  - ( ) State

F. ( ) INDUSTRIAL
  - ( ) Research & Development
  - ( ) Manufacturing
  - ( ) Decon. Facility & Waste Reduction
  - ( ) Sealed Sources/Gauges/Devices

2. If under the above license(s) radioactive waste is generated at locations other than the licensee address above, check this box and attach a list of those locations including complete addresses. ☑

3. If your answers to #4, 5(a) and 5(b) are zero, you need not complete remainder of this form. Sign below, date and return this survey.

Edward A Tupin — Signature of Person Completing Form

Radiation Safety Officer — Title

2/22/94 — Date

Waste Inventory

4. Estimate volume of Low-Level Radioactive Waste (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 Part 61.55 for the definitions of Class A, B, C or greater than Class C wastes.
Also, estimate the volume of Mixed Waste that you expect to have in storage as of January 1, 1993. Mixed waste refers to that radioactive waste 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 Class	Class A	Class B	Class C	Greater Than Class C	Mixed Waste	Total Volume
Volume in Cubic Feet	3	0	0	0	0	3

Gross Waste Volumes

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

Waste Class	1993 Cu. Ft.	1994 Cu. Ft.	1995 Cu. Ft.	Total Cubic Feet
Class A	65	75	75	215
Class B	0	0	0	0
Class C	0	0	0	0
Greater Than Class C	0	0	0	0
Total	65	75	75	215

Waste Class	1996 Cu. Ft.	1997 Cu. Ft.	1998 Cu. Ft.	Total Cubic Feet
Class A	75	75	75	225
Class B	0	0	0	0
Class C	0	0	0	0
Greater Than Class C	0	0	0	0
Total	75	75	75	225

Waste Class	1999 Cu. Ft.			Total Cubic Feet
Class A	75			515
Class B	0			0
Class C	0			0
Greater Than Class C	0			0
Total	75			515

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

	1993 Cu. Ft.	1994 Cu. Ft.	1995 Cu. Ft.	Total Cubic Feet
Mixed Waste	15	15	15	45

	1996 Cu. Ft.	1997 Cu. Ft.	1998 Cu. Ft.	Total Cubic Feet
Mixed Waste	15	15	15	45

	1999 Cu. Ft.			Total Cubic Feet
Mixed Waste	15			105

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

Volume Reduction

6\. a.) Indicate On-Site Volume Reduction methods that you will utilize to reduce the volumes indicated in #5(a) and (b) above (1993 through 1998). Also indicate percent of volume reduction you expect to achieve.

Compaction	0 %	Decontamination	0 %
Incineration	0 %	Total Volume Reduction	0 %

b.) If you do not use any On-Site Volume Reduction methods now, do you intend to use or install any volume reduction systems in the future at your facility for wastes indicated in #5(a) and (b)? What systems do you intend to install?

None proposed at this time.

c.) Indicate any additional permits or license amendments you will require for 6(a) and (b). What is your schedule to obtain those permits or license amendments?

None

d.) By utilizing on-site waste reduction/minimization methods, how much waste volume reduction have you achieved so far? 30 %

7\. a.) Indicate any Off-Site Volume Reduction services that you will utilize to reduce the volumes indicated in #5(a) and (b) (1993 through 1998). Also indicate percent of volume reduction that you expect to achieve.

Super Compaction	25 %	Incineration	25 %
Decontamination	0 %	Total Volume Reduction	50 %

b.) 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?

Authority to receive back compacted waste; Requested 11/28/93

c.) Will the Off-Site Waste Reduction Vendor ship the volume of reduced waste back to you for storage? Yes and No.

If not, what will happen to that waste? Compacted waste to be returned. Scintillation fluid used for heat recovery; crushed vials sent to land fill by vendor

d.) By utilizing off-site waste reduction services, how much waste volume reduction have you achieved so far? 25 %

e.) What are your contingency plans should Off-Site Volume Reduction methods not be available to you?

Dedicate additional space to storage; possibly install compactor on-site

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 VOLUMES IN CUBIC FEET			Total Cubic Feet
	1993	1994	1995	
Class A	65.	~~95~~ 30	30	125
Class B	0	0	0	0
Class C	0	0	0	0
Greater Than Class C	0	0	0	0
Mixed Waste	15 *	0	0	0
Total	80	30	30	125

Waste Type	NET VOLUMES IN CUBIC FEET			Total Cubic Feet
	1996	1997	1998	
Class A	30	30	30	90
Class B	0	0	0	0
Class C	0	0	0	0
Greater Than Class C	0	0	0	0
Mixed Waste	0	0	0	0
Total	30	30	30	90

Waste Type	NET VOLUMES IN CUBIC FEET			Total Cubic Feet
	1999			
Class A	30.			245
Class B	0			0
Class C	0			0
Greater Than Class C	0			0
Mixed Waste	0			0
Total	30			245

* LSC Vials
Shipped January 1994

Net waste volumes are net of waste to be disposed of following decay in storage. Thus they will not mathematically track as projected from listed volume reduction methods

Storage

9. a.) Will you store waste indicated in #8 On-Site until December 31, 1999? yes

b.) If not, then what contingency plans do you have for that waste? ______

10. a.) Indicate On-Site Storage Capacity you will have by January 1, 1993, for total waste volume indicated in #8.
Total Capacity 95 Cubic Feet *

b.) Indicate any additional permits or license amendments you will require for On-Site Storage of waste until December 31, 1999.

Routine renewal of license during 1999; Authority to exced NRC-recomended 5 year period for holding waste on-site

c.) What is your schedule to obtain these permits or license amendments?

License renewal during 1999. Authority to exced 5 year hold will be requested in 1997, when the length of extension may be more accurately predicted.

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

Hazardous & Solid Waste Management Admin.
Maryland Department of the Environment
2500 Broening Highway
Baltimore, Maryland 21224
Attention: Niel Thompson

* Additional space has been converted to waste storage. More space will be made available as waste volumes require

ENCLOSURE C

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

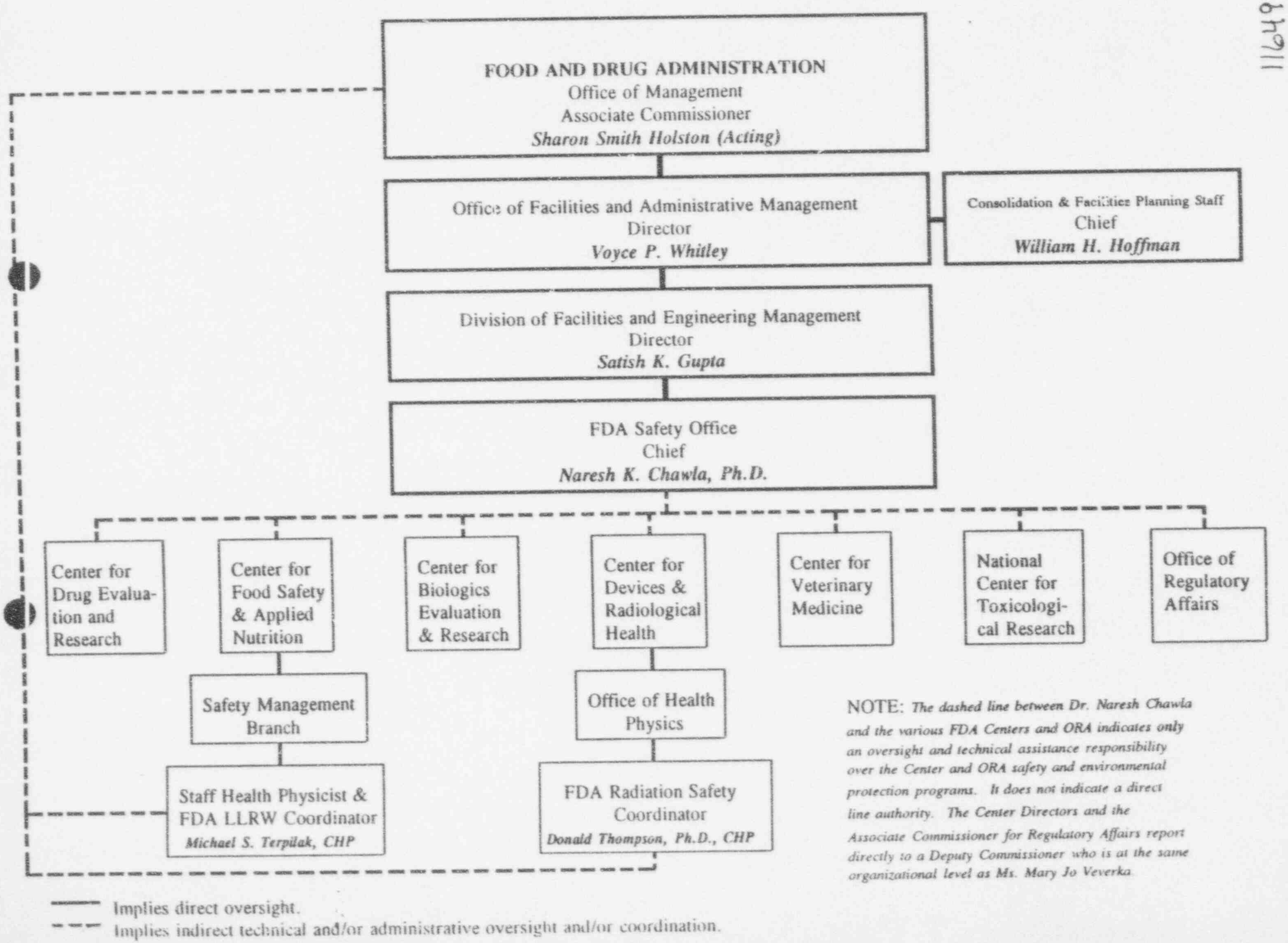
Mary Jo Veverka

FOOD AND DRUG ADMINISTRATION
Office of Management
Associate Commissioner for Management

Sharon Smith Holston (Acting)

(Continued on Next Page)

116499



NOTE: *The dashed line between Dr. Naresh Chawla and the various FDA Centers and ORA indicates only an oversight and technical assistance responsibility over the Center and ORA safety and environmental protection programs. It does not indicate a direct line authority. The Center Directors and the Associate Commissioner for Regulatory Affairs report directly to a Deputy Commissioner who is at the same organizational level as Ms. Mary Jo Veverka.*

08-00482-03 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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COMMENTS: FDA - Copies of research papers published by FDA employees at the Beltsville Research Facility in Beltsville, MD.

Proc. Soc. Exp. Biol. Med. 141, 765- (1972)

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

C. L. Litterst[1] and E. J. van Loon

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 closed-system 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 pregnant 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 μmoles 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 mannitol-sucrose 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. Results were analyzed statistically by the Student's *t* 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 μmoles/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 enzyme-inducing compound studied that produced significant increases in protein or P-450 content at doses lower than 150 μmoles/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 II, 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 dietary amounts of DDT, phenobarbital, 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.

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

by
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Division of Toxicology
Food and Drug Administration
Department of Health, Education, and Welfare
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 microsomal drug-metabolizing 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 LOON (1972) showed that the inducing activity of PCB 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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rats - raise question of dose at BRC

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[redacted]

was prepared in corn oil and PB in 0.85% saline. Control animals were given equivalent volumes of vehicle. Experiments designed to demonstrate the stability of PCB-induced enzymes were conducted by feeding rats a diet containing 50 ppm of PCB for a period of 7 days. A group of rats was then killed (0 time) and microsomal enzymes and components 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 PB were each administered to six rats, control groups also consisted of six rats. After treatment, the rats were killed by cervical dislocation, and their livers were excised, weighed, and homogenized in mannitol-sucrose buffer as previously described (LITTERST et al. 1972). All subsequent manipulations were conducted in a cold room at 4°C. The six livers from each treatment group were pooled in groups of two each for enzyme assays, which were conducted in duplicate. The supernatant fraction from a 9000 x *g* centrifugation of the liver homogenate was used for assays of N-demethylation of ethylmorphine, nitroreduction of p-nitrobenzoic acid, and hydroxylation of ^{14}C-pentobarbital. The 9000 x *g* supernatant was centrifuged for 1 hour at 105,000 x *g* and the resulting pellet was used for determination of microsomal protein and cytochrome P-450 content. All enzyme and component assays have been described in detail in a previous communication (LITTERST et al. 1972). Differences between treated groups and control groups were judged significant by a two-tailed Student's *t* test at $P<0.05$.

Results

Table 1 summarizes the results of experiments in which PCB or PB was fed to rats 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 LOON 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 significant increases in levels of hepatic 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 rate than earlier, while nitroreductase and P-450 continued the rapid increase in activity.

The results of oral administration of a single dose of 50 mg/kg of PCB or PB are shown in Table 2. Most parameters reached peak values by 24 hours after treatment, although in animals treated with PCB, hydroxylation apparently did not reach a peak in activity until at least 48 hours after treatment. The relative quantities of cytochrome P-450 detectable in microsomal pellets appeared to be more closely related to activity of ethylmorphine demethylase than to activity of the other enzymes studied. PCB

TABLE I

Development of Induction in Microsomes of Rat Livers Following Dietary Administration of PCB or Phenobarbital (PB)[a]

Days on Diet	Treatment [b]	Liver: Body Weight Ratio	Protein (mg/g)	P-450 (nmoles/mg)	Demethylation (nmoles/g/30 min)	Nitroreduction (µg/g/30 min)	Hydroxylation (µg/g/30 min)
7	0	0.033±0.003	28.1±0.6	0.62±0.02	4125±438	49.2±7.4	0.22±0.02
	PCB	0.037±0.001	34.6±4.4	0.78±0.06[c]	8750±575[c]	148.1±18.2[c]	0.44±0.04[c]
	PB	0.035±0.004	33.9±2.2[c]	0.78±0.02[c]	8263±1285[c]	105.0±10.2[c]	0.40±0.08
14	0	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[c]	1.03±0.11[c]	8354±2020[c]	149.3±8.6[c]	0.40±0.04[c]
	PB	0.034±0.001	23.4±0.9	0.75±0.04	6896±1236[c]	88.0±6.2[c]	0.28±0.01[c]
28	0	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[c]	1.28±0.16[c]	7729±1385[c]	212.8±46.0[c]	0.66±0.16[c]
	PB	0.034±0.003	33.9±1.2	0.86±0.05[c]	6605±337[c]	105.0±7.2[c]	0.40±0.02[c]

[a] Values are means ± S.D. of 3 replicates except nitroreductase activity at 7 days where n=2.

[b] Rats were given diets containing 50 ppm of Aroclor® 1254 or phenobarbital for the times indicated.

[c] Statistically 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 Rats[a]

Hours after Treatment	Treatment[b]	Liver: Body Weight Ratio	Protein (mg/g)	P-450 (nmoles/mg)	Demethylation (nmoles/g/30 min)	Nitroreduction (µg/g/30 min)	Hydroxylation (µg/g/30 min)
6	0	0.035±0.002	32.2±0.3	0.61±0.02	6262±388	81.2±6.2	0.24±0.02
	PCB	0.037±0.001	31.6±1.0	0.64±0.06	4938±840	74.6±3.2	0.20±0.01
	PB	0.038±0.002	32.8±1.3	0.62±0.02	7104±1315	88.7±12.1	0.22±0.04
12	0	0.030±0.002	32.5±1.9	0.65±0.01	5969±219	65.9±3.4	0.26±0.02
	PCB	0.036±0.001[c]	36.0±2.2	0.93±0.09[c]	7417±449[c]	95.5±5.7[c]	0.28±0.02
	PB	0.033±0.002	40.0±1.3[c]	0.73±0.01[c]	7281±221[c]	103.0±2.0[c]	0.28±0.04
24	0	0.035±0.002	26.9±0.3	0.68±0.08	7592±192	76.2±5.8	0.26±0.03
	PCB	0.040±0.001[c]	38.8±1.8[c]	1.25±0.01[c]	13479±1515[c]	180.4±41.8[c]	0.38±0.02[c]
	PB	0.039±0.003	36.0±2.4[c]	1.25±0.03[c]	16354±2153[c]	207.7±35.1[c]	0.44±0.08[c]
48	0	0.035±0.001	32.0±1.0	0.57±0.01	5094±654	73.8±18.8	0.20±0.02
	PCB	0.042±0.002[c]	40.8±4.1	1.06±0.09[c]	10875±2378[c]	200.8±28.9[c]	0.44±0.14[c]
	PB	0.040±0.002[c]	39.4±1.8[c]	0.93±0.13[c]	12500±2558[c]	169.3±32.5[c]	0.42±0.09[c]

[a] Values are means ± S.D. of 3 replicates.

[b] Rats were given 50 mg/kg PCB or phenobarbital by stomach tube.

[c] 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 PCB and PB produced similar responses in enzyme activity; the activity

TABLE 3

Stability of Induced Enzymes or Components Following Removal of the Inducing Substance[a]

Days on Control Diet	Treatment	Liver: Body Weight Ratio	Protein (mg/g)	P-450 (nmoles/mg)	Demethylation (nmoles/g/30 min)	Nitro reduction (µg/g/30 min)	Hydroxylation (µg/g/30 mi)
0	0	0.032±0.002	27.5±0.8	0.40±0.01	4818±254	42.7±2.2	0.22±0.02
	PCB	0.048±0.003[b]	32.5±1.6[b]	0.56±0.02[b]	8727±375[b]	104.6±16.1[b]	0.47±0.05[b]
	PB	0.044±0.001[b]	31.4±0.6[b]	0.48±0.03[b]	7567±574[b]	94.4±4.6[b]	0.41±0.04[b]
3	0	0.037±0.001	27.0±0.5	0.48±0.03	4875±775	55.0±4.0	0.26±0.04
	PCB	0.041±0.001[b]	32.5±0.4[b]	0.49±0.03	8362±512[b]	76.5±5.5[b]	0.48±0.04[b]
	PB	0.042±0.004[b]	30.1±0.9[b]	0.49±0.04	6687±262[b]	62.5±3.5[b]	0.38±0.02[b]
5	0	0.041±0.002	37.2±2.5	0.42±0.03	5640±196	46.0±0.6	0.28±0.02
	PCB	0.049±0.003[b]	44.2±2.4[b]	0.58±0.03[b]	10980±770[b]	72.4±10.3[b]	0.44±0.08[b]
	PB	0.045±0.001	40.5±2.2	0.42±0.02	6640±315[b]	53.6±6.3	0.28±0.02
10	0	0.042±0.002	45.0±1.6	0.38±0.01	4680±368	47.2±2.0	0.28±0.04
	PCB	0.041±0.002	47.7±1.1	0.44±0.01[b]	5730±531	57.7±1.9[b]	0.42±0.02[b]
	PB	0.041±0.002	45.4±2.0	0.41±0.05	4800±300	50.6±1.6	0.28±0.02

[a] 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 ± 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 Swine[1]

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The Effect of Lindane and Phenobarbital on Microsomal Enzyme Induction in Dogs and Miniature Swine. 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 9000*g* 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. Preparations 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 phenobarbital-treated 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 xenobiotics 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 insecti- des 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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Studies by Radomski and Fiserova-Bergerova (1967) in the United States and by Brown (1967) in Canada indicate that lindane[3] 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 (Gillette, 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 1–2 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[4] 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 Teflon–glass homogenizer at 4°C for an additional 30 sec. The 9000*g* 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 9000*g* 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

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[3] γ Isomer of hexachlorocyclohexane. Also referred to as γ-benzene hexachloride (γ-BHC).

[4] 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 *p*-aminophenol 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 lindane 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, lindane 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 9000*g* for 30 min in an International PR-2 refrigerated centrifuge equipped with a high capacity attachment. The final concentration of the 9000*g* supernatant was adjusted with mannitol–sucrose so that 1 ml was the equivalent of 200 mg of liver tissue.

The 9000*g* 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 $[^{14}C]$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 9000*g* 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 K_2HPO_4–NaH_2PO_4 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 $[^{14}C]$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; $p < 0.05$ was 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 9000*g* 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 ± 5.2 and 67.8 ± 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 lindane-treated dogs and was markedly inhibited in the phenobarbital-induced dogs given lindane, whereas nitroreductase activity was significantly increased in the lindane-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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DEPARTMENT OF HEALTH & HUMAN SERVICES
Public Health Service

Food and Drug Administration
Washington DC 20204

January 13, 1994

MS16
K-2

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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JAN 14 1994

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

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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 cm^2. 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 cm^2. Please confirm that you will use a removable contamination limit of 200 dpm/100 cm^2 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 cm^2 listed in Table 2 of the DFP is a typographical error. The correct value is 200 dpm/100 cm^2.

Question 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 <u>at this time</u>.

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 "<u>Final</u> 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 e: 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 <u>appear</u> 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:

Facility	ISOTOPE INVENTORY (micro curies)			
	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 cm^2 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 cm^2) 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

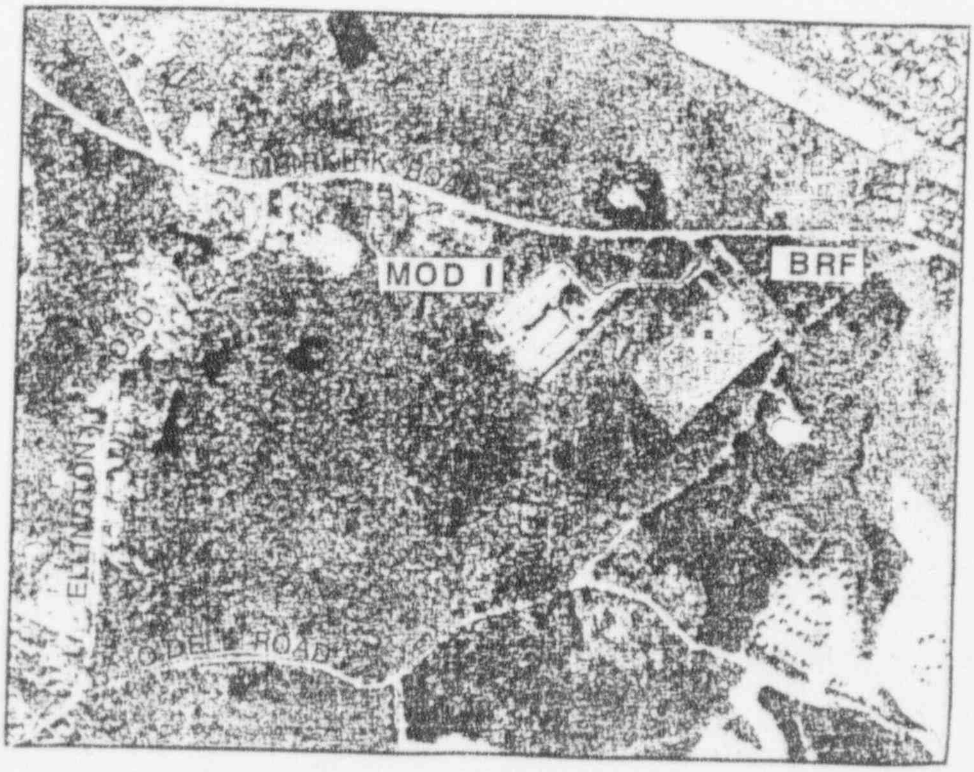
GREENHORNE & O'MARA
PHASE II INITIAL ENVIRONMENTAL SITE ASSESSMENT
APPENDIX H
(Selected Pages)

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 Washington, DC 20407

Contract No. 11P92EGD0002
Work Order No. P1193EG0072

Prepared by:

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

October 1993
(301) 982-2800

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

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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)

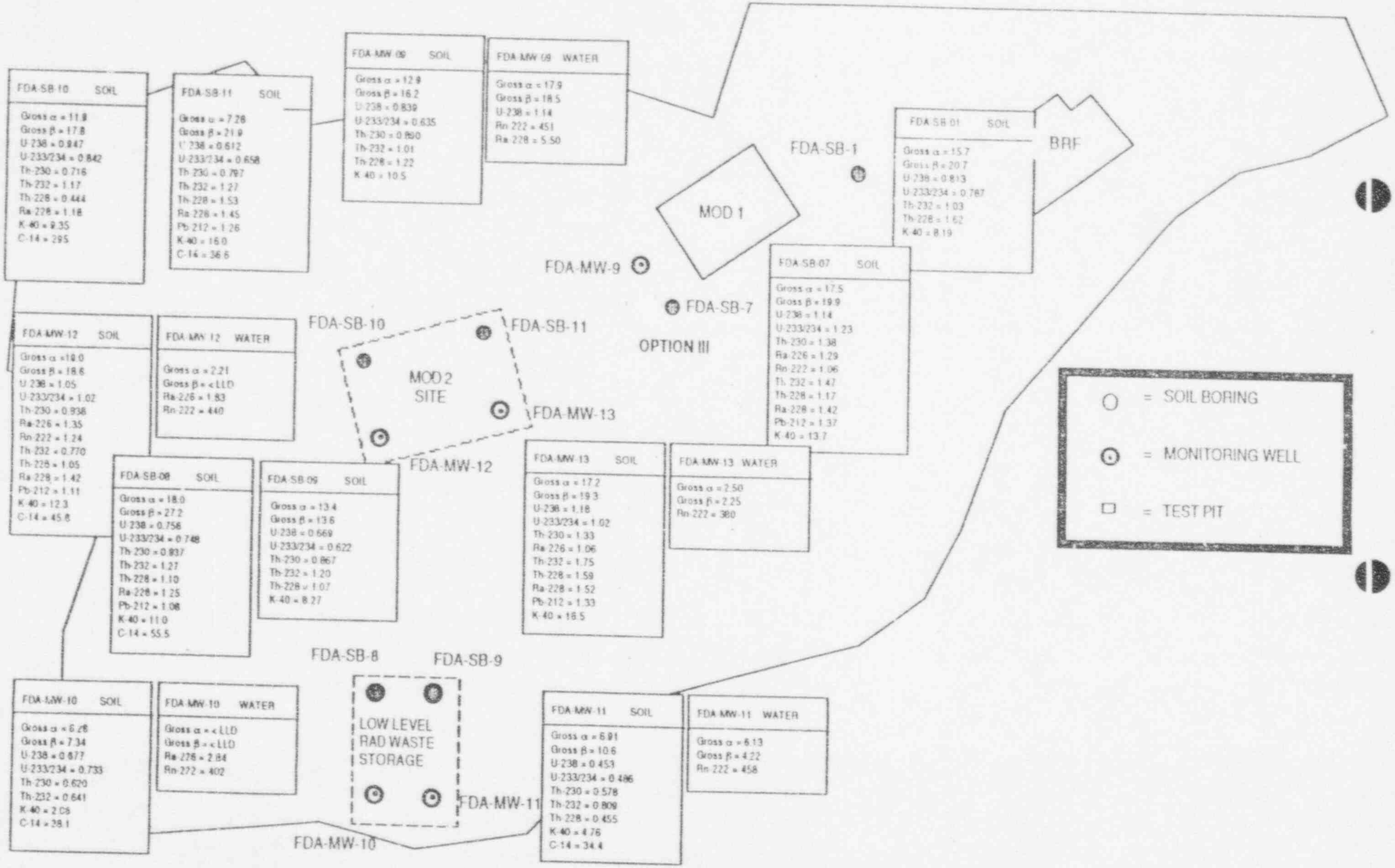

Figure 2.1 a. Approximate Locations of Excavations - The Mod II and the RWS Site.

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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
Ludlum Model 3 Rate Meter With	Alpha	17.2	#93037	04-05-93
Ludlum Model 63-65 Alpha Scintillation Det.		(Th-230)	#089767	
Ludlum Model 3 Rate Meter With	Beta Gamma	12.6	#93939	04-05-93
Ludlum 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/cm^2 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 ½" 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

Table 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 Investigation (Option 1)	4
3. FDA-SB-3	1 Soil		
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 Storage	2.5
9. FDA-SB-9	1 Soil		
10. FDA-SB-10	1 Soil	Mod II Building Site	3.5
11. FDA-SB-11	1 Soil		
Monitoring 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 Investigation (Option 1)	4
17. FDA-MW-6	1 Water, 1 Soil		
18. FDA-MW-7	1 Water, 1 Soil	UST at BRF	2.5

Table 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 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-13	
26.	FDA-MW-14	1 Water	QC Duplicate of MW-10	
27.	FDA-MW-30	1 Wa	QC Duplicate of MW-3	
	Test Pits	Sample Obtained	Location	
28.	FDA-TP-1	1 Soil	Septic System Test Pits	2
29.	FDA-TP-2	1 Soil		
30.	FDA-TP-3	1 Soil		
31.	FDA-TP-4	1 S		
32.	FDA-TP-5	1 Soil	Septic Drain Field Test Pits	2.5
33.	FDA-TP-6	1 Soil		
34.	FDA-TP-7	1 Soil (Not Analyzed)		
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		
40.	FDA-TP-13	1 Soil	Septic Drain Field	2.5

Table 2.2

Hand Augered Samples	Sample Obtained	Location	
41. FDA-UST-HA-1	1 Soil (Not Analyzed)	UST at BRF	2.5
42. FDA-UST-HA-2	1 Soil		
43. FDA-UST-HA-3	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.

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.

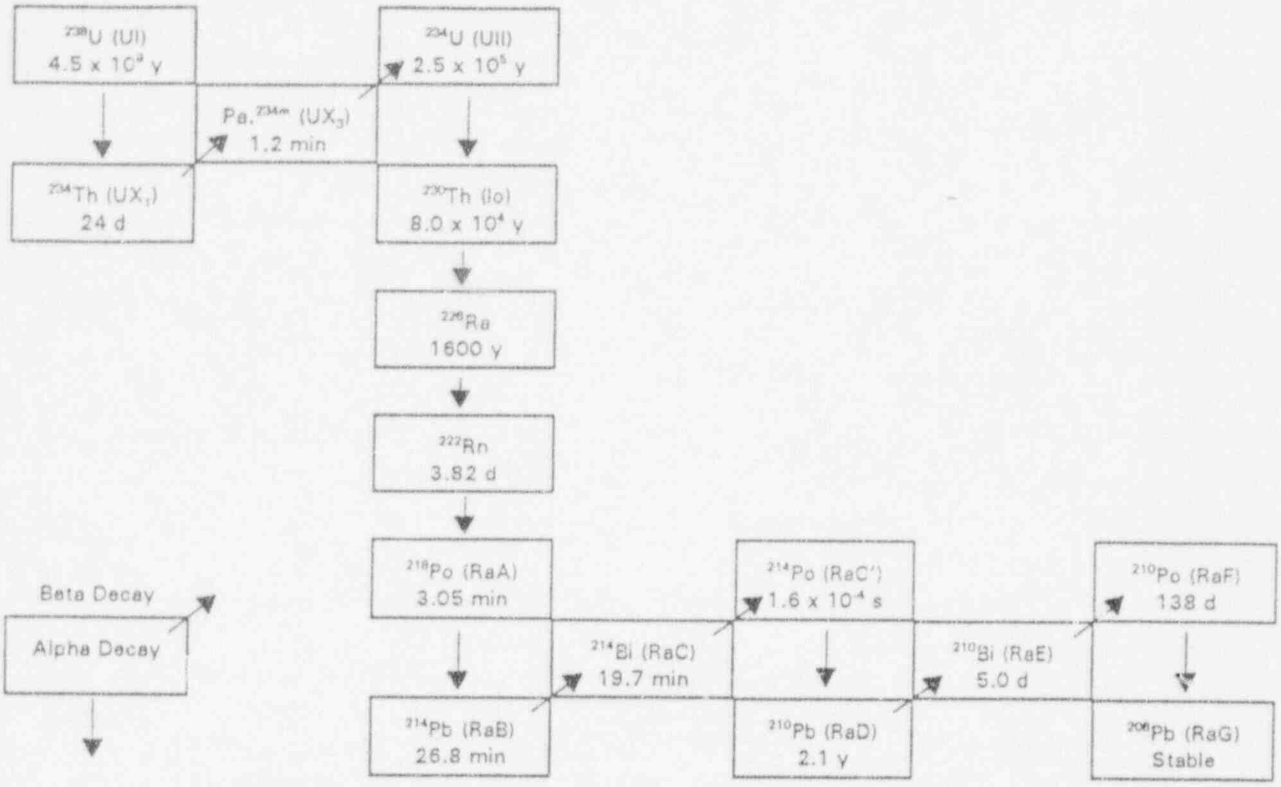

Fig. 3.1 Primordial Nuclides Decay Chain - Uranium Series

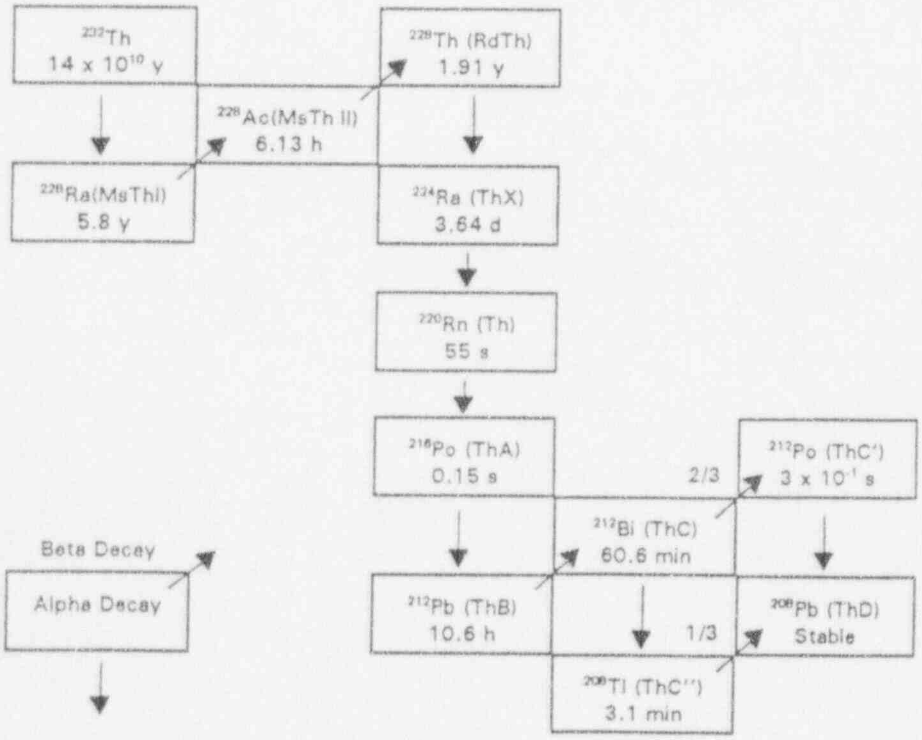

Fig. 3.2 Primordial Nuclides Decay Chain - Thorium Series

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	Water (pCi/L)		Soil (pCi/g)	
	LLD	Naturally Occurring Level	LLD	Naturally Occurring Level
Gross Alpha	2.00		5.00	
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		

* Specific Activity

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.

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 SUMMARY OF ANALYTIC
{Units: soil - pCi/g; water -

			Gross Alpha	Non-Vol. Beta	U-238	U-233/23
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	Type	Location				
MW-1	Soil	Background	▨	▨	▨	0.212
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	0.256
MW-6	Soil	Option 1	▨	7.82	0.280	0.325
MW-7	Soil	UST Area	5.80	7.63	0.421	0.363
MW-8	Soil	Option 2	5.65	▨	▨	0.319
MW-9	Soil	Option 3	12.9	16.2	0.839	0.635
MW-10	Soil	LLRWS Site	6.28	7.34	0.677	0.733
MW-11	Soil	LLRWS Site	6.91	10.6	0.453	0.486
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	▨	▨
MW-8	Water	Option 2	4.18	5.84	▨	▨
MW-9	Water	Option 3	17.9	18.5	1.14	▨
MW-10	Water	LLRWS Site	▨	▨	▨	▨
MW-11	Water	LLRWS Site	6.13	4.22	▨	▨
MW-12	Water	Mod 2 Site	2.21	▨	▨	▨
MW-13	Water	Mod 2 Site	2.50	2.25	▨	▨
MW-14	Water	Mod 2 Site	▨	▨	▨	▨
MW-30	Water	Septic Sys.	3.09	4.07	NA	NA
SW-1	Water	Outfall	▨	17.1	▨	▨

Note1 ▨ Denotes levels measure
Note2 NA Not Analyzed

L RESULTS OBTAINED F ROM THE BELTSVILLE SITE

pCi/L; except where indicated otherwise}

	Isotopes						Gamma-PHA			
4	Th-230	Ra-226	Rn-222	Th-232	Th-228	Ra-228	Pb-212	K-40	Cs-137	C-14
	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	
	0.245			0.235						
	1.08			1.44	1.37		1.03	7.20		
	NA	NA		NA	NA	NA				
				0.471				1.81		
	0.279			0.379	0.244					
				0.359	0.436			2.35		
	0.373			0.596	0.492			2.17		96.9
				0.262						
	0.890			1.01	1.22			10.5		
	0.620			0.641				2.06		38.1
	0.578			0.809	0.455			4.76		34.4
	0.938	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		
	0.753	1.10		0.909	1.15	1.44	1.29	15.7		
		2.92	341			1.60				
		2.67				1.50				
	NA	NA		NA	NA	NA				
		1.31	204							
						1.60				
		2.99				1.30				
			335			2.20				
						1.60				
			451			5.50				
		2.84	402							
			458							
		1.83	440							
			380							
			295							
	NA	NA		NA	NA	NA				

are below LLD

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TABLE 3.2b SUMMARY

			Gross Alpha	Non-Vol. Beta
LLD		Soil	5.00	5.00
Natural	Levels	Soil		
Sample-ID	Type	Location		
HA-2	Soil	UST Area	▨	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	▨	▨
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	▨	▨
TP-13	Soil	Septic Sys.	5.30	▨

Note1 Samples TP-7, HA

Note2 ▨ Denotes

Note3 NA Not Analy

DF ANALYTICAL RESULTS OBTAINED F ROM THE BELTSVILLE SITE

{Units - pCi/g}

Isotopes								Gamma-PHA			
-238	U-233/234	Th-230	Ra-226	Rn-222	Th-232	Th-228	Ra-228	Pb-212	K-40	Cs-137	C-14
.200	0.200	0.200	1.00	1.00	0.200	0.200	1.00	1.00	1.00	0.100	20.0
.700	0.700	0.700	1.00	1.00	0.700	0.700	0.70		10.0	0.000	
.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			0.839	0.794			6.64		
.813	0.787				1.03	1.62			8.19		
.693	0.634	0.868			1.06	1.23	1.43	1.06	6.23		
.525	0.483	0.322			1.03	0.807			3.65		
.232	0.318	0.334			0.429				1.28		
.319	0.510	0.862			0.702	0.613					
.256		0.284							1.03		
1.14	1.23	1.38	1.29	1.06	1.47	1.17	1.42	1.37	13.7		
0.756	0.748	0.937			1.27	1.10	1.25	1.08	11.0		55.5
0.669	0.622	0.867			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	0.925	0.981			1.02	0.772			6.08		
0.482	0.508	0.516			0.828	0.830			4.21		
0.711	0.700	0.631			0.710				6.43		
0.698	0.669				0.857				1.13		
0.636	0.581	1.82			0.447	0.477			1.37		
0.936	0.890	0.972			0.479				2.03		
NA	NA	NA	NA		NA	NA	NA				
0.416	0.345	0.501			0.403	0.635			1.25		83.9
0.513	0.564				0.425	0.782			4.75		
0.606	0.524				0.608				5.32		
NA	NA	NA	NA		NA	NA			1.46		
0.274	0.456	0.350			0.401						46.4

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1 and HA-3 were not sent for analysis.

evels measured are below LLD

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TABLE 3.3 SUMMARY OF ANALYTICAL RESULTS OBTAINED FROM THE BELTSVILLE SITE

{Units: soil - pCi/g; water - pCi/L; except where indicated otherwise}

			Gross Alpha	Non-Vol. Beta	Isotopes								Gamma-PHA			
					U-238	U-233/234	Th-230	Ra-226	Rn-222	Th-232	Th-228	Ra-228	Pb-212	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+05
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				0.212	0.245			0.235						
MW-1	Water	Background	12.9	10.9				2.92	341			1.60				
MW-10	Soil	LLRWS Site	6.28	7.34	0.677	0.733	0.620			0.641				2.06		38.1
MW-10	Water	LLRWS Site						2.84	402							
MW-14	Water	LLRWS Site							295							
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			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					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		
SB-10	Soil	Mod 2 Site	11.9	17.8	0.947	0.842	0.716			1.17	0.444	1.18		9.35		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		36.6
MW-5	Soil	Option 1			0.229	0.256	0.279			0.379	0.244					
MW-5	Water	Option 1	4.93	5.07								1.60				
MW-6	Soil	Option 1		7.82	0.280	0.325				0.359	0.436			2.35		
MW-6	Water	Option 1	8.77	8.20				2.99				1.30				

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		
SB-4	Soil	Option 1	6.95	6.74	0.232	0.318	0.334			0.429				1.28		
SB-5	Soil	Option 1			0.319	0.510	0.862			0.702	0.613					
MW-8	Soil	Option 2	5.65			0.319				0.262						
MW-8	Water	Option 2	4.18	5.84								1.60				
SB-6	Soil	Option 2			0.256		0.284							1.03		
MW-9	Soil	Option 3	12.9	16.2	0.839	0.635	0.890			1.01	1.22			10.5		
MW-9	Water	Option 3	17.9	18.5	1.14				451			5.50				
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			NA	NA	NA	NA		NA	NA	NA		2.19	0.150	
SW-1	Water	Outfall		17.1												
HA-4	Soil	Refuse Area	9.75	10.1	0.645	0.578	0.449			0.606	1.38			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		
MW-2	Soil	Refuse Area	12.1	11.9	0.656	0.829	1.08			1.44	1.37		1.03	7.20		
MW-2	Water	Refuse Area	4.35	5.43				2.67				1.50				
TP-10	Soil	Refuse Area	7.69	14.2	0.513	0.564				0.425	0.782			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		1.46		
TP-9	Soil	Refuse Area	6.99	5.61	0.416	0.345	0.501			0.403	0.635			1.25		83.9
MW-3	Soil	Septic Sys.			NA	NA	NA	NA		NA	NA	NA				
MW-3	Water	Septic Sys.	2.65	4.53	NA	NA	NA	NA		NA	NA	NA				
MW-30	Water	Septic Sys.	3.09	4.07	NA	NA	NA	NA		NA	NA	NA				
MW-4	Soil	Septic Sys.	5.23	5.80	0.446	0.488				0.471				1.81		
MW-4	Water	Septic Sys.	2.75	5.56				1.31	204							
TP-1	Soil	Septic Sys.	11.9	15.0	0.898	0.925	0.981			1.02	0.772			6.08		
TP-13	Soil	Septic Sys.	5.30		0.274	0.456	0.350			0.401						46.4
TP-2	Soil	Septic Sys.	7.66	9.21	0.482	0.508	0.516			0.828	0.830			4.21		
TP-3	Soil	Septic Sys.	9.46	14.8	0.711	0.700	0.631			0.710				6.43		
TP-4	Soil	Septic Sys.	18.2	13.6	0.698	0.669				0.857				1.13		
TP-5	Soil	Septic Sys.	7.12	6.46	0.636	0.581	1.82			0.447	0.477			1.37		
TP-6	Soil	Septic Sys.	9.21	6.76	0.936	0.890	0.972			0.479				2.03		
TP-8	Soil	Septic Sys.			NA	NA	NA	NA		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		96.9
MW-7	Water	UST Area	9.79	11.0					335			2.20				

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Note1		Samples TP-7, HA-1 and HA-3 were not sent for analysis.
Note2	▨	Denotes levels measured are below LLD
Note3	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.

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 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 modem 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	12Ci
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:

  i. 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 100μC of Beta emitters and/or Gamma emitters or not more than 10μC 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.

1. 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 abovementioned 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

1. Radiological Quality of the Environment in the United States, 1977, U.S. Environmental Protection Agency, EPA 520/1-77-009.

2. Exposure of the Population in the United States and Canada from Natural Background Radiation, NCRP-94, National Council for Radiation Protection, December 30, 1987.

3. Tritium in the Environment, NCRP-67, National Council for Radiation Protection, 1979.

4. Ground Water Concentrations of Radiums, Isotopes, Health Physics Journal, Vol. 48, No. 5.

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	Analyst	Date	Time
Radiological						
Gross Alpha - 3 items						
Accuracy, Gross Alpha		1.03 pCi/L		DHC	05/08/93	1200
Gross Alpha		2.65 pCi/L				
Weight of Sample, A&B		22.7 mg				
Nonvolatile Beta - 3 items						
Accuracy, Nonvolatile Beta		0.990 pCi/L				
Nonvolatile Beta		4.53 pCi/L				
Weight of Sample, A&B		22.7 mg				
Gamma PHA - 40 items						
Accuracy, Actinium-228		0.00 pCi/L	HASL 300	MDS	05/04/93	0304
Accuracy, Antimony-125		0.00 pCi/L				
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-152		0.00 pCi/L				
Accuracy, Europium-154		0.00 pCi/L				
Accuracy, Europium-155		0.00 pCi/L				
Accuracy, Lead-212		15.3 pCi/L				
Accuracy, Manganese-54		0.00 pCi/L				
Accuracy, Potassium-40		52.7 pCi/L				
Accuracy, Promethium-144		0.00 pCi/L				
Accuracy, Promethium-146		0.00 pCi/L				
Accuracy, Ruthenium-106		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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Report Date: June 04, 1993

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Sample ID : FDA-MW-3

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	0304
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		25.3 pCi/L	HASL 300	WBS	05/20/93	1805
Carbon-14	<	200 pCi/L				
Radon-222 - 2 items						
Accuracy, Radon-222		133 pCi/L	HASL 300	MDS	05/04/93	1929
Radon-222	<	200 pCi/L				
Tritium - 2 items						
Accuracy, Tritium		0.200 pCi/mL	EPA 906.0	MDS	05/06/93	0152
Tritium	<	0.700 pCi/mL				

CERTIFICATE OF ANALYSIS

Client: Pacific Nuclear
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Contact: Ms. Cathy Hall

cc: PCFN00193 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.

Analytical Report Specialist

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CERTIFICATE OF ANALYSIS

Client: Pacific Nuclear
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Contact: Ms. Cathy Hall

cc: PCFN00193

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	Time
Radiological							
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 items							
Accuracy, Nonvolatile Beta		1.04	pCi/L				
Nonvolatile Beta		5.56	pCi/L				
Weight of Sample, A&B		21.1	mg				
Alpha Spectroscopy Thorium - 6 items							
Accuracy, Thorium-228		0.118	pCi/L	HASL 300	CSH	05/17/93	1801
Accuracy, Thorium-230		0.0831	pCi/L				
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 Uranium - 6 items							
Accuracy, Uranium-233/234		0.190	pCi/L	HASL 300	BTM	05/17/93	1342
Accuracy, Uranium-235		0.00	pCi/L				
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				
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				

CERTIFICATE OF ANALYSIS

Client: Pacific Nuclear
1111 Pasquinelli Drive
Suite 100
Westmont, Illinois 60559
Contact: Ms. Cathy Hall

cc: PCFN00193 Report Date: June 03, 1993 Page 2 of 3

Sample ID : FDA-MW-4

Parameter	Qualifier	Result Units	Method	Analyst	Date	Time
Accuracy, Cobalt-60		0.00 pCi/L				
Accuracy, Europium-152		0.00 pCi/L	HASL 300	MDS	05/04/93	2115
Accuracy, Europium-154		0.00 pCi/L				
Accuracy, Europium-155		0.00 pCi/L				
Accuracy, Lead-212		0.00 pCi/L				
Accuracy, Manganese-54		0.00 pCi/L				
Accuracy, Potassium 40		55.5 pCi/L				
Accuracy, Promethium-144		0.00 pCi/L				
Accuracy, Promethium-146		0.00 pCi/L				
Accuracy, Ruthenium-106		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				
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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Sample ID : FDA-MW-4

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

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Sample ID : FDA-MW-30
Lab ID : 9304566-02
Matrix : GroundH2O
Date Collected : 04/27/93
Date Received : 04/30/93
Priority : Routine
Collector : Client

Parameter	Qualifier	Result Units	Method	Analyst	Date	Time
Radiological						
Gross Alpha - 3 items						
Accuracy, Gross Alpha		1.05 pCi/L		DHC	05/08/93	1200
Gross Alpha		3.09 pCi/L				
Weight of Sample, A&B		15.1 mg				
Nonvolatile Beta - 3 items						
Accuracy, Nonvolatile Beta		0.960 pCi/L				
Nonvolatile Beta		4.07 pCi/L				
Weight of Sample, A&B		15.1 mg				
Gamma PHA - 40 items						
Accuracy, Actinium-228		0.00 pCi/L	HASL 300	MDS	05/04/93	2116
Accuracy, Antimony-125		0.00 pCi/L				
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-152		0.00 pCi/L				
Accuracy, Europium-154		0.00 pCi/L				
Accuracy, Europium-155		0.00 pCi/L				
Accuracy, Lead-212		8.27 pCi/L				
Accuracy, Manganese-54		0.00 pCi/L				
Accuracy, Potassium-40		0.00 pCi/L				
Accuracy, Promethium-144		0.00 pCi/L				
Accuracy, Promethium-146		0.00 pCi/L				
Accuracy, Ruthenium-106		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				

9304566-02

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Sample ID : FDA-MW-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				
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		19.0 pCi/L	HASL 300	WBS	05/20/93	1835
Carbon-14	<	200 pCi/L				
Radon-222 - 2 items						
Accuracy, Radon-222		133 pCi/L	HASL 300	MDS	05/04/93	2034
Radon-222	<	200 pCi/L				
Tritium - 2 items						
Accuracy, Tritium		0.200 pCi/mL	EPA 906.0	MDS	05/06/93	0152
Tritium	<	0.700 pCi/mL				

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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
Radiological							
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 Beta		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	1142
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-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		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

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	1142
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	<	1.00	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	pCi/g				
Zinc-65	<	0.200	pCi/g				
Carbon-14 - 2 items							
Accuracy, Carbon-14		9.37	pCi/g	HASL 300	WBS	05/06/93	1425
Carbon-14	<	20.0	pCi/g				
Radon-222 - 2 items							
Accuracy, Radon-222		0.00	pCi/g	HASL 300	MDS	04/23/93	1212
Radon-222	<	1.00	pCi/g				
Tritium - 2 items							
Accuracy, Tritium		4.38	pCi/g	EPA 906.0 modified	ADW	04/22/93	1630
Tritium	<	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 : 04/16/93
Date Received : 04/22/93
Priority : Routine
Collector : Client

Parameter	Qualifier	Result Units	Method	Analyst	Date	Time
Radiological						
Gross Alpha - 3 items						
Accuracy, Gross Alpha		2.06 pCi/g		CWS	04/27/93	1230
Gross Alpha		5.23 pCi/g				
Weight of Sample, A&B		9.50 mg				
Nonvolatile Beta - 3 items						
Accuracy, Nonvolatile Beta		1.83 pCi/g				
Nonvolatile Beta		5.80 pCi/g				
Weight of Sample, A&B		9.50 mg				
Alpha Spectroscopy Thorium - 6 items						
Accuracy, Thorium-228		0.00 pCi/g	HASL 300	AHT	05/18/93	1739
Accuracy, Thorium-230		0.00 pCi/g				
Accuracy, Thorium-232		0.256 pCi/g				
Thorium-228	<	0.200 pCi/g				
Thorium-230	<	0.200 pCi/g				
Thorium-232		0.471 pCi/g				
Alpha Spectroscopy Uranium - 6 items						
Accuracy, Uranium-233/234		0.173 pCi/g	HASL 300	AHT	05/26/93	0041
Accuracy, Uranium-235		0.0369 pCi/g				
Accuracy, Uranium-238		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 items						
Accuracy, Actinium-228		0.150 pCi/g	HASL 300	MDS	04/27/93	2002
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				

9304422-02

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Sample ID : FDA-MW-4

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-154		0.00 pCi/g				
Accuracy, Europium-155		0.00 pCi/g				
Accuracy, Lead-212		0.0632 pCi/g				
Accuracy, Manganese-54		0.00 pCi/g				
Accuracy, Potassium-40		0.477 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		3.54 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		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	05/13/93	1205

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Sample ID : FDA-MW-4

Parameter	Qualifier	Result	Units	Method	Analyst	Date	Time
Carbon-14	<	20.0	pCi/g				
Radium-226 - 2 items							
Accuracy, Radium-226		0.0820	pCi/g	EPA 903	MDS	05/04/93	0846
Radium-226	<	1.00	pCi/g				
Radium-228 - 2 items							
Accuracy, Radium-228		0.136	pCi/g	EPA 904.0	MDS	05/04/93	0846
Radium-228	<	1.00	pCi/g				
Radon-222 - 2 items							
Accuracy, Radon-222		0.100	pCi/g	HASL 300	MDS	04/27/93	2002
Radon-222	<	1.00	pCi/g				
Tritium - 2 items							
Accuracy, Tritium		4.84	pCi/g	EPA 906.0 modified	ADW	05/07/93	1230
Tritium	<	2.00	pCi/g				

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

Parameter	Qualifier	Result	Units	Method	Analyst	Date	Time
Radiological							
Gross Alpha - 3 items							
Accuracy, Gross Alpha		1.61	pCi/g		CWS	04/22/93	1720
Gross Alpha		11.9	pCi/g				
Weight of Sample, A&B		19.7	mg				
Nonvolatile Beta - 3 items							
Accuracy, Nonvolatile Beta		1.43	pCi/g				
Nonvolatile Beta		15.0	pCi/g				
Weight of Sample, A&B		19.7	mg				
Alpha Spectroscopy Thorium - 6 items							
Accuracy, Thorium-228		0.232	pCi/g	HASL 300	AHT	05/04/93	1834
Accuracy, Thorium-230		0.261	pCi/g				
Accuracy, Thorium-232		0.267	pCi/g				
Thorium-228		0.772	pCi/g				
Thorium-230		0.981	pCi/g				
Thorium-232		1.02	pCi/g				
Alpha Spectroscopy Uranium - 6 items							
Accuracy, Uranium-233/234		0.203	pCi/g	HASL 300	AHT	05/04/93	1835
Accuracy, Uranium-235		0.0406	pCi/g				
Accuracy, Uranium-238		0.198	pCi/g				
Uranium-233/234		0.925	pCi/g				
Uranium-235	<	0.500	pCi/g				
Uranium-238		0.898	pCi/g				
Gamma PHA - 40 items							
Accuracy, Actinium-228		0.172	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				

9304312-11

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Sample ID : FDA-TP-1

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	04/30/93	1143
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				
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		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						
Accuracy, Carbon-14		7.95 pCi/g	HASL 300	WBS	05/06/93	1425

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Sample ID : FDA-TP-1

Parameter	Qualifier	Result Units	Method	Analyst	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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Client: Pacific Nuclear
1111 Pasquinelli Drive
Suite 100
Westmont, Illinois 60559
Contact: Ms. Cathy Hall

cc: PCFN00193 Report Date: June 03, 1993 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 : Routine
Collector : Client

Parameter	Qualifier	Result	Units	Method	Analyst	Date	Time
Radiological							
Gross Alpha - 3 items							
Accuracy, Gross Alpha		3.22	pCi/g		CWS	04/28/93	0710
Gross Alpha		7.66	pCi/g				
Weight of Sample, A&B		15.1	mg				
Nonvolatile Beta - 3 items							
Accuracy, Nonvolatile Beta		2.80	pCi/g				
Nonvolatile Beta		9.21	pCi/g				
Weight of Sample, A&B		15.1	mg				
Alpha Spectroscopy Thorium - 6 items							
Accuracy, Thorium-228		0.187	pCi/g	HASL 300	AHT	05/22/93	1121
Accuracy, Thorium-230		0.152	pCi/g				
Accuracy, Thorium-232		0.187	pCi/g				
Thorium-228		0.830	pCi/g				
Thorium-230		0.516	pCi/g				
Thorium-232		0.828	pCi/g				
Alpha Spectroscopy Uranium - 6 items							
Accuracy, Uranium-233/234		0.116	pCi/g	HASL 300	AHT	05/12/93	1813
Accuracy, Uranium-235		0.0210	pCi/g				
Accuracy, Uranium-238		0.114	pCi/g				
Uranium-233/234		0.508	pCi/g				
Uranium-235	<	0.500	pCi/g				
Uranium-238		0.482	pCi/g				
Gamma PHA - 40 items							
Accuracy, Actinium-228		0.162	pCi/g	HASL 300	MDS	05/03/93	0714
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				

9304367-01

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Sample ID : FDA-TP-2

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	05/03/93	0714
Accuracy, Europium-154		0.00	pCi/g				
Accuracy, Europium-155		0.00	pCi/g				
Accuracy, Lead-212		0.0695	pCi/g				
Accuracy, Manganese-54		0.00	pCi/g				
Accuracy, Potassium-40		0.638	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		1.92	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 items							
Accuracy, Carbon-14		2.53	pCi/g	HASL 300	WBS	05/13/93	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		0.105 pCi/g	EPA 903	MDS	05/03/93	0714
Radium-226	<	1.00 pCi/g				
Radium-228 - 2 items						
Accuracy, Radium-228		0.162 pCi/g	EPA 904.0	MDS	05/03/93	0714
Radium-228	<	1.00 pCi/g				
Radon-222 - 2 items						
Accuracy, Radon-222		0.396 pCi/g	HASL 300	MDS	04/26/93	1336
Radon-222	<	1.00 pCi/g				
Tritium - 2 items						
Accuracy, Tritium		4.74 pCi/g	EPA 906.0 modified	ADW	04/23/93	1745
Tritium	<	2.00 pCi/g				

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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
Collector : Client

Parameter	Qualifier	Result	Units	Method	Analyst	Date	Time
Radiological							
Gross Alpha - 3 items							
Accuracy, Gross Alpha		3.61	pCi/g		CWS	04/28/93	0854
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 - 6 items							
Accuracy, Thorium-228		0.00	pCi/g	HASL 300	AHT	05/19/93	0045
Accuracy, Thorium-230		0.346	pCi/g				
Accuracy, Thorium-232		0.369	pCi/g				
Thorium-228	<	0.200	pCi/g				
Thorium-230		0.631	pCi/g				
Thorium-232		0.710	pCi/g				
Alpha Spectroscopy Uranium - 6 items							
Accuracy, Uranium-233/234		0.136	pCi/g	HASL 300	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				

9304367-02

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Sample ID : FDA-TP-3

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	05/03/93	0715
Accuracy, Europium-154		0.00	pCi/g				
Accuracy, Europium-155		0.00	pCi/g				
Accuracy, Lead-212		0.0740	pCi/g				
Accuracy, Manganese-54		0.00	pCi/g				
Accuracy, Potassium-40		0.761	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		1.22	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	pCi/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							
Accuracy, Carbon-14		2.54	pCi/g	HASL 300	WBS	05/13/93	0317

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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	<	2.00 pCi/g				

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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 pCi/g		CWS	04/28/93	1425
Gross Alpha		18.2 pCi/g				
Weight of Sample, A&B		24.6 mg				
Nonvolatile Beta - 3 items						
Accuracy, Nonvolatile Beta		3.06 pCi/g				
Nonvolatile Beta		13.6 pCi/g				
Weight of Sample, A&B		24.6 mg				
Alpha Spectroscopy Thorium - 6 items						
Accuracy, Thorium-228		0.00 pCi/g	HASL 300	AHT	05/16/93	1210
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 Uranium - 6 items						
Accuracy, Uranium-233/234		0.134 pCi/g	HASL 300	AHT	05/12/93	1813
Accuracy, Uranium-235		0.0308 pCi/g				
Accuracy, Uranium-238		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						
Accuracy, Actinium-228		0.244 pCi/g	HASL 300	MDS	05/03/93	0931
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-4

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	05/03/93	0931
Accuracy, Europium-154		0.00	pCi/g				
Accuracy, Europium-155		0.00	pCi/g				
Accuracy, Lead-212		0.0872	pCi/g				
Accuracy, Manganese-54		8.15	pCi/g				
Accuracy, Potassium-40		1.13	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		3.00	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		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							
Accuracy, Carbon-14		2.93	pCi/g	HASL 300	WBS	05/13/93	0347

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Sample ID : FDA-TP-4

Parameter	Qualifier	Result	Units	Method	Analyst	Date	Time
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	<	1.00	pCi/g				-
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							
Accuracy, Tritium		4.42	pCi/g	EPA 906.0 modified	ADW	04/23/93	1915
Tritium	<	2.00	pCi/g				

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Sample ID : FDA-TP-5
Lab ID : 9304367-04
Matrix : Soil
Date Collected : 04/13/93
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		3.21	pCi/g		CWS	04/28/93	1213
Gross Alpha		7.12	pCi/g				
Weight of Sample, A&B		22.5	mg				
Nonvolatile Beta - 3 items							
Accuracy, Nonvolatile Beta		2.57	pCi/g				
Nonvolatile Beta		6.46	pCi/g				
Weight of Sample, A&B		22.5	mg				
Alpha Spectroscopy Thorium - 6 items							
Accuracy, Thorium-228		0.128	pCi/g	HASL 300	AHT	05/16/93	1210
Accuracy, Thorium-230		0.295	pCi/g				
Accuracy, Thorium-232		0.123	pCi/g				
Thorium-228		0.477	pCi/g				
Thorium-230		1.82	pCi/g				
Thorium-232		0.447	pCi/g				
Alpha Spectroscopy Uranium - 6 items							
Accuracy, Uranium-233/234		0.132	pCi/g	HASL 300	AHT	05/12/93	1813
Accuracy, Uranium-235		0.00	pCi/g				
Accuracy, Uranium-238		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 items							
Accuracy, Actinium-228		0.187	pCi/g	HASL 300	MDS	05/03/93	0933
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-5

Parameter	Qualifier	Result Units	Method	Analyst	Date	Time
Accuracy, Cobalt-60		0.00 pCi/g	HASL 300	MDS	05/03/93	0933
Accuracy, Europium-152		0.00 pCi/g				
Accuracy, Europium-154		0.00 pCi/g				
Accuracy, Europium-155		0.00 pCi/g				
Accuracy, Lead-212		0.0795 pCi/g				
Accuracy, Manganese-54		0.00 pCi/g				
Accuracy, Potassium-40		0.489 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		1.12 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		1.37 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		1.42 pCi/g	HASL 300	WBS	05/13/93	0417

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cc: PCFN00193

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Page 3 of 3

Sample ID : FDA-TP-5

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

This data report has been prepared and reviewed
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Flora

Analytical Report Specialist

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Client: Pacific Nuclear
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cc: PCFN00193 Report Date: June 03, 1993 Page 1 of 3

Sample ID : FDA-TP-6
Lab ID : 9304367-05
Matrix : Soil
Date Collected : 04/13/93
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		2.35 pCi/g		CWS	04/25/93	0210
Gross Alpha		9.21 pCi/g				
Weight of Sample, A&B		11.4 mg				
Nonvolatile Beta - 3 items						
Accuracy, Nonvolatile Beta		1.82 pCi/g				
Nonvolatile Beta		6.76 pCi/g				
Weight of Sample, A&B		11.4 mg				
Alpha Spectroscopy Thorium - 6 items						
Accuracy, Thorium-228		0.00 pCi/g	HASL 300	AHT	05/16/93	0802
Accuracy, Thorium-230		0.190 pCi/g				
Accuracy, Thorium-232		0.123 pCi/g				
Thorium-228	<	0.200 pCi/g				
Thorium-230		0.972 pCi/g				
Thorium-232		0.479 pCi/g				
Alpha Spectroscopy Uranium - 6 items						
Accuracy, Uranium-233/234		0.186 pCi/g	HASL 300	AHT	05/12/93	1813
Accuracy, Uranium-235		0.0447 pCi/g				
Accuracy, Uranium-238		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 items						
Accuracy, Actinium-228		0.137 pCi/g	HASL 300	MDS	05/03/93	1213
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				

9304367-05

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Sample ID : FDA-TP-6

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	05/03/93	1213
Accuracy, Europium-154		0.00	pCi/g				
Accuracy, Europium-155		0.00	pCi/g				
Accuracy, Lead-212		0.0622	pCi/g				
Accuracy, Manganese-54		0.00	pCi/g				
Accuracy, Potassium-40		0.513	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		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	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		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							
Accuracy, Carbon-14		1.92	pCi/g	HASL 300	WBS	05/13/93	0447

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Report Date: June 03, 1993

Page 3 of 3

Sample ID : FDA-TP-6

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

This data report has been prepared and reviewed
in accordance with General Engineering Laboratories
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Flora L. [illegible]

Analytical Report Specialist

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CERTIFICATE OF ANALYSIS

Client: Pacific Nuclear
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Contact: Ms. Cathy Hall

cc: PCFN00193 Report Date: June 03, 1993 Page 1 of 3

Sample ID : FDA-TP-8
Lab ID : 9304312-12
Matrix : Soil
Date Collected : 04/13/93
Date Received : 04/16/93
Priority : Routine
Collector : Client

Parameter	Qualifier	Result	Units	Method	Analyst	Date	Time
Radiological							
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&B		4.30	mg				
Nonvolatile Beta - 3 items							
Accuracy, Nonvolatile Beta		1.43	pCi/g				
Nonvolatile Beta	<	5.00	pCi/g				
Weight of Sample, A&B		4.30	mg				
Gamma PHA - 40 items							
Accuracy, Actinium-228		0.00	pCi/g	HASL 300	MDS	04/30/93	1437
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		0.0567	pCi/g				
Accuracy, Manganese-54		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-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				

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: PCFN00193 Report Date: June 03, 1993 Page 2 of 3

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				
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	pCi/g				
Zinc-65	<	0.200	pCi/g				
Carbon-14 - 2 items							
Accuracy, Carbon-14		8.39	pCi/g	HASL 300	WBS	05/06/93	1425
Carbon-14	<	20.0	pCi/g				
Radon-222 - 2 items							
Accuracy, Radon-222		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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Sample ID : FDA-TP-8

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
Radiological							
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 items							
Accuracy, Nonvolatile Beta		1.79	pCi/g				
Nonvolatile Beta	<	5.00	pCi/g				
Weight of Sample, A&B		5.10	mg				
Alpha Spectroscopy Thorium - 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 Uranium - 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-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				

9304422-03

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Page 2 of 3

Sample ID : FDA-TP-13

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	2003
Accuracy, Europium-154		0.00	pCi/g				
Accuracy, Europium-155		0.00	pCi/g				
Accuracy, Lead-212		0.0538	pCi/g				
Accuracy, Manganese-54		0.00	pCi/g				
Accuracy, Potassium-40		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		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	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	pCi/g				
Zinc-65	<	0.200	pCi/g				
Carbon-14 - 2 items							
Accuracy, Carbon-14		4.46	pCi/g	HASL 300	WBS	05/13/93	1235

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Page 3 of 3

Sample ID : FDA-MW-13

Parameter	Qualifier	Result	Units	Method	Analyst	Date	Time
Carbon-14	<	200	pCi/L				
Radium-226 - 2 items							
Accuracy, Radium-226		0.370	pCi/L	EPA 903	ADW	05/18/93	1525
Radium-226	<	1.00	pCi/L				
Radium-228 - 2 items							
Accuracy, Radium-228		0.900	pCi/L	EPA 904.0	RLM	05/18/93	2137
Radium-228	<	1.00	pCi/L				
Radon-222 - 2 items							
Accuracy, Radon-222		71.6	pCi/L	HASL 300	MDS	05/12/93	1901
Radon-222		380	pCi/L				
Tritium - 2 items							
Accuracy, Tritium		0.200	pCi/mL	EPA 906.0	MDS	05/12/93	1229
Tritium	<	0.700	pCi/mL				

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Analytical Report Specialist

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4312

CHAIN OF CUSTODY RECORD

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PO Box 30712
Charleston, South Carolina 29417
803-556-8171

Page 1 of 1

Client Name / Facility Name: Pacific Nuclear / ~~FDA~~ GEO R6

Collected By / Company: P. Gianutsos / GTS

SAMPLE ANALYSIS REQUIRED(x) - use remarks area to specify specific compounds or methods

← Use F or P in the boxes to indicate whether sample was filtered and/or preserved

SAMPLE ID	DATE	TIME	WELL	SOIL	COMP	GRAB	# of containers	pH, conductivity	TOC / DOC	TOX	Chloride, Fluoride, Sulfate	Nitrite/Nitrate	VOC - Specify Method required	METALS - specify	Pesticide	Herbicide	Total Phenol	Acid Extractables	B/N Extractables	PCB's	Cyanide	Coliform - specify type	RADIOACTIVITY	Remarks
FDA-MW-3	4-15-93	1055		x			2																x	Screening
FDA-MW-6	4-13-93	1400		x			2																x	Full analysis
FDA-TP-1	4-8-93	1550		x			2																x	screening
FDA-TP-8	4-13-93	1005		x			2																x	Screening
FDA-SD-4	4-15-93	0715		x			2																x	Full analysis
FDA-SB-5	4-14-93	1340		x			2																x	Full analysis

Relinquished by: P. Gianutsos	Date 4/15/93	Time 1530	Received by:	Relinquished by:	Date	Time	Received by:	
Relinquished by:	Date	Time	Received by lab by: C. Bell	Date 4/16/93	Time 1:15	Remarks		

White • sample collector Yellow • file Pink • with report

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CHAIN OF CUSTODY RECORD

Page 1 of 1

Client Name / Facility Name: Pacific Nuclear / G&O

Collected By / Company: P. Gianutsos / GTS

SAMPLE ANALYSIS REQUIRED(x) - use remarks area to specify specific compounds or methods

← Use F or P in the boxes to indicate whether sample was filtered and/or preserved

004 167	SAMPLE ID	DATE	TIME	WELL	SOIL	COMP	GRAB	# of containers	pH, conductivity	TOC / DOC	TOX	Chloride, Fluoride, Sulfate	Nitrite/Nitrate	VOC - Specify Method required	METALS - specify	Pesticide	Herbicide	Total Phenol	Acid Extractables	B/N Extractables	PCB's	Cyanide	Coliform - specify type	RADIOACTIVITY		MDS Remarks
01	FDA-TP-2	4-8-93	1330		x			2																x		Screening
02	FDA-TP-3	4-8-93	1640		x			2																x		Screening
03	FDA-TP-4	4-9-93	1100		x			2																x		Screening
04	FDA-TP-5	4-13-93	1630		x			2																x		Screening
05	FDA-TP-6	4-13-93	1630		x			2																x		Screening
06	FDA-TP-9	4-12-93	0930		x			2																x		Screening

Relinquished by:	Date	Time	Received by:	Relinquished by:	Date	Time	Received by:
P. Gianutsos	4/19/93	1605					

Relinquished by:	Date	Time	Received by Lab by:	Date	Time	Remarks
			J Widener	4-20-93	1400	

White • sample collector   Yellow • file   Pink • with report

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Page 1 of 1

Client Name / Facility Name: Pacific Nuclear / G&O

Collected By / Company: R.Giantsos / GTS

SAMPLE ANALYSIS REQUIRED(s) - use remarks area to specify specific compounds or methods

Use F or P in the boxes to indicate whether sample was filtered and/or preserved

1304 122	SAMPLE ID	DATE	TIME	WELL	SOIL	COMP	GRAB	# of containers	pH, conductivity	TOC / DOC	TOX	Chloride, Fluoride, Sulfate	Nitrite/Nitrate	VOC - Specify Method required	METALS - specify	Pesticide	Herbicide	Total Phenol	Acid Extractables	B/N Extractables	PCB's	Cyanide	Coliform - specify type	RADIOACTIVITY	MDS Remarks
01	FDA-MW-2	4-19-93	1315		X			2																Y	screening
02	FDA-MW-4	4-16-93	0855		Y			2																Y	screening
04	FDA-MW-9	4-21-93	1030		Y			2																Y	Full Analysis
05	FDA-SB-6	4-15-93	0855		Y			2																Y	Full Analysis
06	FDA-SB-7	4-21-93	0800		Y			2																Y	Full Analysis
03	FDA-TP-13	4-13-93	1715		Y			2																Y	screening

Relinquished by:	Date	Time	Received by:	Relinquished by:	Date	Time	Received by:
R Giantsos	4/21/93	1135					

Relinquished by:	Date	Time	Received by lab by:	Date	Time	Remarks
			J Widener	4.22.93	1145	

White • sa collector Yellow • file Pink • with report

CHAIN OF CUSTODY RECORD

General Engineering Laboratories
2040 Savage Road
Charleston, South Carolina 29414
PO Box 30712
Charleston, South Carolina 29417
803-556-8171

Page 1 of 1

Client Name / Facility Name: Pacific Nuclear / G&O

Collected By / Company: PR Gianutsos / GTS

SAMPLE ANALYSIS REQUIRED(x) - use remarks area to specify specific compounds or methods

← Use F or P in the boxes to indicate whether sample was filtered and/or preserved

	SAMPLE ID	DATE	TIME	WELL	SOIL	COMP	GRAB	# of containers	pH, conductivity	TOC / DOC	TOX	Chloride, Fluoride, Sulfate	Nitrite/Nitrate	VOC - Specify Method required	METALS - specify	Pesticide	Herbicide	Total Phenol	Acid Extractables	B/N Extractables	PCB's	Cyanide	Coliform - specify type	RADIOACTIVITY	MDS Remarks
01	FDA-TP-2	4-8-93	1330		x			2																x	Screening
02	FDA-TP-3	4-8-93	1640		x			2																x	Screening
03	FDA-TP-4	4-9-93	1100		x			2																x	Screening
04	FDA-TP-5	4-13-93	1630		x			2																x	Screening
05	FDA-TP-6	4-13-93	1630		x			2																x	Screening
06	FDA-TP-9	4-12-93	0930		x			2																x	Screening

Relinquished by: PR Giantsos	Date 4/19/93	Time 1605	Received by:	Relinquished by:	Date	Time	Received by:
Relinquished by:	Date	Time	Received by Lab by: Wildner	Date 4-20-93	Time 1400	Remarks	

White • sample collector Yellow • file Pink • with report

1304566

CHAIN OF CUSTODY RECORD

Page 1 of 1

General Engineering Laboratories
2040 Savage Road
Charleston, South Carolina 29414
PO Box 30712
Charleston, South Carolina 29417
803-556-8171

Client Name / Facility Name: Pacific Nuclear / G&O

Collected By / Company: P. Bianutsos / GTS

SAMPLE ANALYSIS REQUIRED(x) - use remarks area to specify specific compounds or methods

Use F or P in the boxes to indicate whether sample was filtered and/or preserved ←

NOTE: All 1/2 gal. containers preserved w/ HNO_3

MDL

SAMPLE ID	DATE	TIME	WELL	SOIL	COMP	GRAB	# of containers	pH, conductivity	TOC / DOC	TOX	Chloride, Fluoride, Sulfate	Nitrite/Nitrate	VOC - Specify Method required	METALS - specify	Pesticide	Herbicide	Total Phenol	Acid Extractables	B/N Extractables	PCB's	Cyanide	Coliform - specify type	RADIOACTIVITY		Remarks
FDA-MW-3	4-27-93	1745	✓				5																x		Screening
FDA-MW-30	4-27-93	1755	✓				5																x		screening
FDA-MW-4	4-27-93	1805	✓				5																x		screening
FDA-SB-9	4-28-93	1330		✓			2																x		Full analysis req'd

Relinquished by:	Date	Time	Received by:	Relinquished by:	Date	Time	Received by:
P. Bianutsos	4/29/93	0845					

Relinquished by:	Date	Time	Received by lab by:	Date	Time	Remarks
			C Bell	4/30/93	1400	

White • sample collector   Yellow • file   Pink • with report

ATTACHMENT 2

ROUTINE RADIATION SURVEYS

ECOLOGY SERVICES, INC.

RADIATION SAFETY SURVEY

COMPANY NAME FDA

BLDG FB8

ROOM NO. 2266

AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE NO.	DATE (month, day, year) 12-29-92
SURVEYOR	NAME (last, first initial) WATTS C	PHONE NO.	SURVEY METER USED N/A

COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
✓		(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 coats
		(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
		(21) Corridor storage meets requirements
✓		(22) Radiation levels < 2.5 mR/hr
✓		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 3H	<100	→								→
NUCLIDE 2										
NUCLIDE 3										

METER 1	METER 2	METER 3

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

Rev. Oct 1990

ECOLOGY SERVICES, INC.

COMPANY NAME FDA

RADIATION SAFETY SURVEY

BLDG FB8

ROOM NO. 3756

AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE NO.	DATE (month, day, year) 12-29-92
SURVEYOR	NAME (last, first initial) WATTS, C	PHONE NO.	SURVEY METER USED L3 w/ 44-9

COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
/		(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 coats
		(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
		(21) Corridor storage meets requirements
/		(22) Radiation levels < 2.5 mR/hr
/		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
/		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 β	<100	→								→
NUCLIDE 2										
NUCLIDE 3										

METER 1	METER 2	METER 3

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

UNABLE TO LOCATE SURVEY METER

Rev. Oct 1990

ECOLOGY SERVICES, INC.

COMPANY NAME FDA

RADIATION SAFETY SURVEY

BLDG FB8

ROOM NO. 3838

AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE NO.	DATE (month, day, year) 12-29-92
SURVEYOR	NAME (last, first initial) WATTS, C	PHONE NO.	SURVEY METER USED N/A

COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
		(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 coats
		(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
		(21) Corridor storage meets requirements
		(22) Radiation levels < 2.5 mR/hr
		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1										
NUCLIDE 2										
NUCLIDE 3										

METER 1	METER 2	METER 3

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

LAB UNAVAILABLE FOR SURVEY

Rev. Oct 1990

ECOLOGY SERVICES, INC.

COMPANY NAME FDA

RADIATION SAFETY SURVEY

BLDG FB8

ROOM NO. 6846

AUTHORIZED INVESTIGATOR NAME (last, first initial)

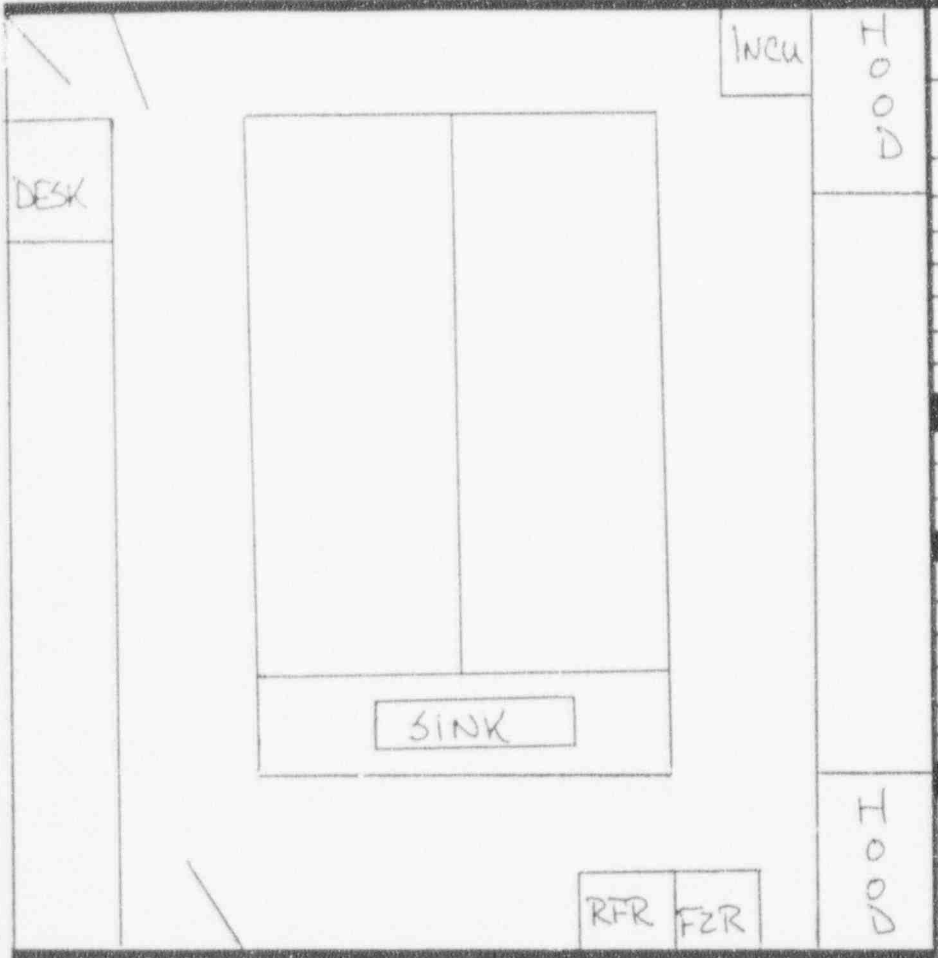
PHONE NO.

DATE (month, day, year) 12-29-92

SURVEYOR NAME (last, first initial) WATTS C

PHONE NO.

SURVEY METER USED N/A



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
		(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 coats
		(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
		(21) Corridor storage meets requirements
		(22) Radiation levels < 2.5 mR/hr
		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1										
NUCLIDE 2										
NUCLIDE 3										

METER 1	METER 2	METER 3

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

No RAM USE

Rev. Oct 1990

ECOLOGY SERVICES, INC.

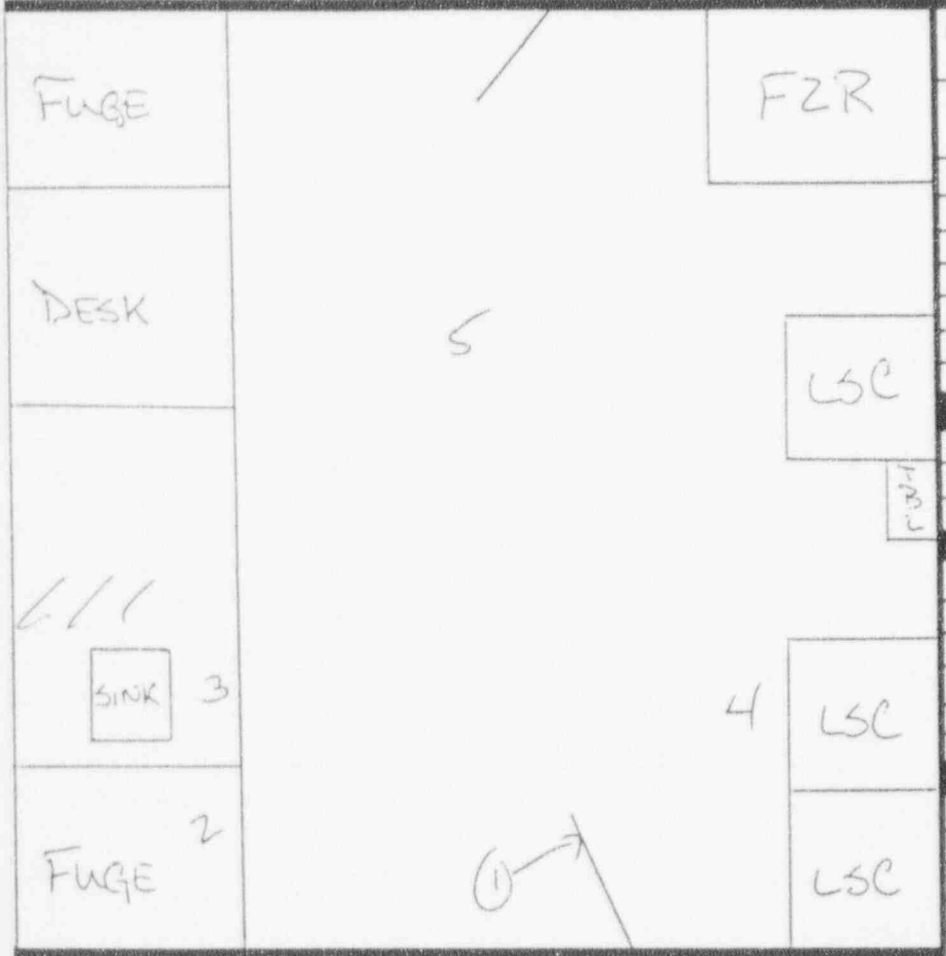
RADIATION SAFETY SURVEY

COMPANY NAME FDA

BLDG FB8

ROOM NO. 6448

AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE NO.	DATE (month, day, year) 12-29-92
SURVEYOR	NAME (last, first initial)	PHONE NO.	SURVEY METER USED L3 -1 44-9



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
/		(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 coats
		(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
		(21) Corridor storage meets requirements
/		(22) Radiation levels <2.5 mR/hr
/		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
/		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 β	<100	⟶	⟶	⟶	⟶					
NUCLIDE 2										
NUCLIDE 3										

METER 1	METER 2	METER 3

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

Rev. Oct 1990

ECOLOGY SERVICES, INC.

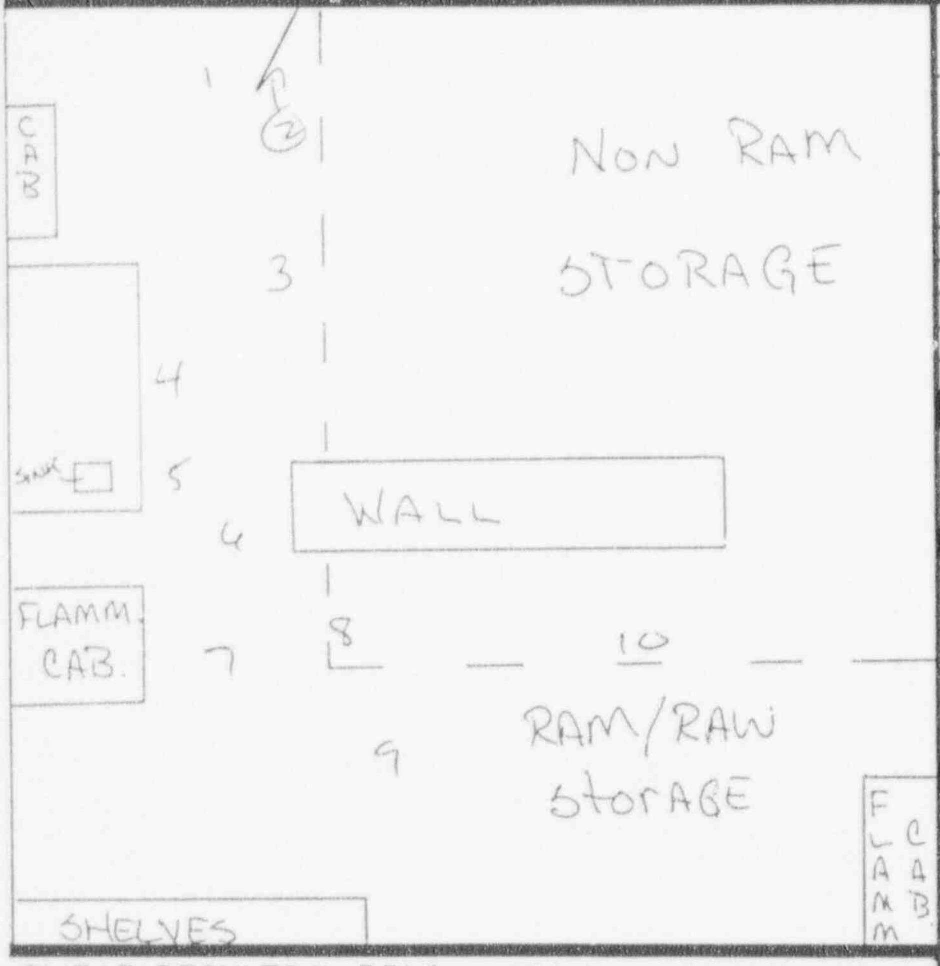
RADIATION SAFETY SURVEY

COMPANY NAME FDA

BLDG FB8

ROOM NO. 6446

AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE NO.	DATE (month, day, year) 12-29-92
SURVEYOR	NAME (last, first initial) WATTS, C	PHONE NO.	SURVEY METER USED Bw 44-9



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
/		(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 coats
		(15) Shielding, if required
/		(16) Prohibition of eating, drinking, and smoking
		(17) Inventory/disposal record•
		(18) Survey records current
		(19) Personnel trained
		(20) Prohibition on mouth pipetting
		(21) Corridor storage meets requirements
/		(22) Radiation levels <2.5 mR/hr
/		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
/		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

METER 1	METER 2	METER 3

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE β	<100									→
NUCLIDE 2										
NUCLIDE 3										

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

Rev. Oct 1990

ECOLOGY SERVICES, INC.
300 Second St., Laurel, Maryland 207.
(301) 498-1514

Company Name: FDA

RADIATION SAFETY SURVEY

Building / Room: BRF / LAB 18

Authorized Investigator: NAME:

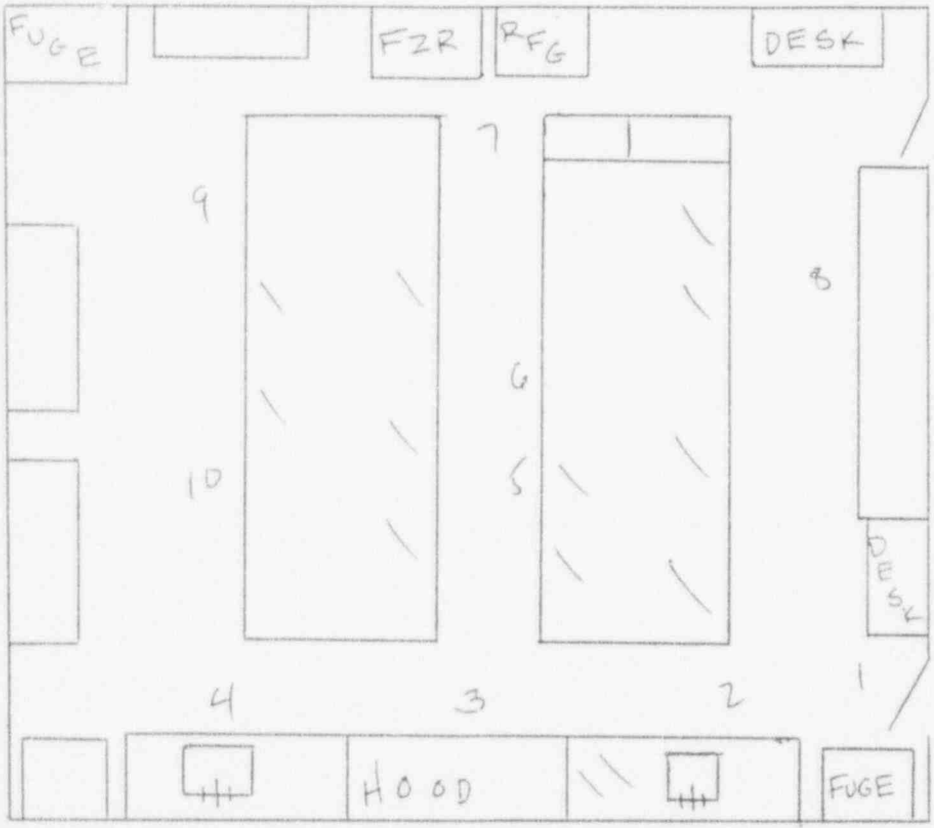
Phone No.

Date: 12-29-92

Surveyor: NAME: WATTS, C

Phone No.

Survey Meter Used: L3 – 44-9



Wipe Sample Results:

LOCATION:	1	2	3	4	5	6	7	8	9	10
Nuclide 1 β	<100	→								
Nuclide 2										
Nuclide 3										
Nuclide 4										

Note: All wipe sample results are in units of DPM / 100 sq. cm.

Comments:

Compliance Items: Y - Compliance
Y N ☐ ☐
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
- ☐ ☐ Adequate use of Shielding
- ☐ ☐ Prohibition of eating, drinking, etc.
- ☐ ☐ Inventory & Disposal Records
- ☐ ☐ Survey Records Current
- ☐ ☐ Personnel Trained
- ☐ ☐ Prohibition on Mouth Pipetting
- ☑ ☐ Radiation Levels
- ☑ ☐ Contamination (Wipes) < 100 DPM/100 sq. cm.

Survey Instrument:

- ☐ ☐ Calibration Current
- ☐ ☐ Operational
- ☑ ☐ Available
- ☐ ☐ Other (Specify in Comments)

ECOLOGY SERVICES, INC.

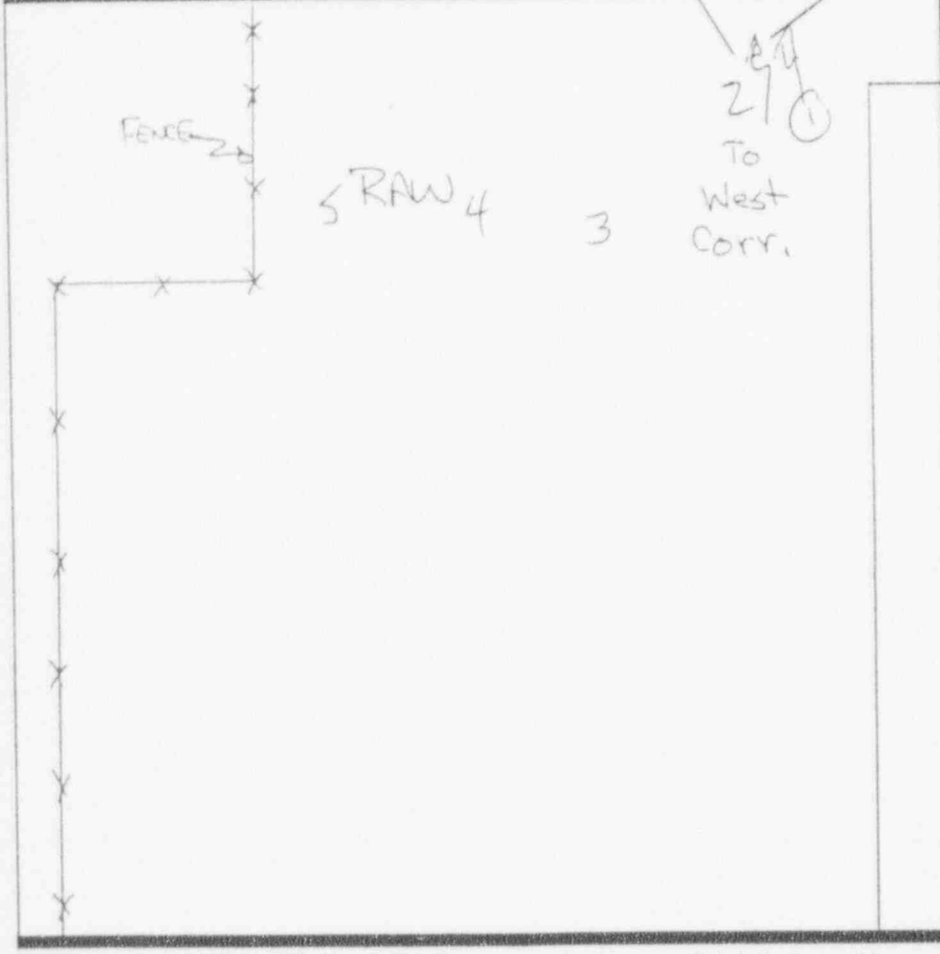
COMPANY NAME FDA

RADIATION SAFETY SURVEY

BLDG. BRF

ROOM NO. Loading Dock

AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE NO.	DATE (month, day, year) 12-29-92
SURVEYOR	NAME (last, first initial) WATTS C	PHONE NO.	SURVEY METER USED L3 w/ 44-9



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
		(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 coats
		(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
		(21) Corridor storage meets requirements
✓		(22) Radiation levels < 2.5 mR/hr
✓		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
✓		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

METER 1	METER 2	METER 3

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 P	<100	→	→	→	→					
NUCLIDE 2										
NUCLIDE 3										

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

Rev. Oct 1990

ECOLOGY SERVICES, INC.

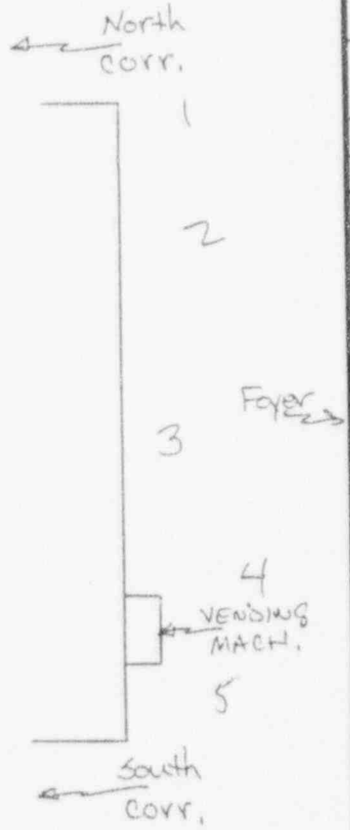
COMPANY NAME FDA

RADIATION SAFETY SURVEY

BLDG BRF

ROOM NO East Corr.

AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE NO.	DATE (month, day, year) 12-29-92
SURVEYOR	NAME (last, first initial) Watts, C	PHONE NO.	SURVEY METER USED L3 w/ 44-9



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
		(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 coats
		(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
✓		(21) Corridor storage meets requirements
✓		(22) Radiation levels < 2.5 mR/hr
✓		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 ^{32}P	<100	→	→	→	→					
NUCLIDE 2										
NUCLIDE 3										

METER 1	METER 2	METER 3

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

Rev. Oct 1990

ECOLOGY SERVICES, INC.

COMPANY NAME FDA

RADIATION SAFETY SURVEY

BLDG BRF

ROOM NO. 14

AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE NO.	DATE (month, day, year) 12-29-92
SURVEYOR	NAME (last, first initial) Watts, C	PHONE NO.	SURVEY METER USED L3 w/ 44-9

COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
/		(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 coats
/		(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
		(21) Corridor storage meets requirements
/		(22) Radiation levels < 2.5 mR/hr
/		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
/		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 β	<100	→								
NUCLIDE 2										
NUCLIDE 3										

METER 1	METER 2	METER 3

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

Rev. Oct 1990

ECOLOGY SERVICES, INC.

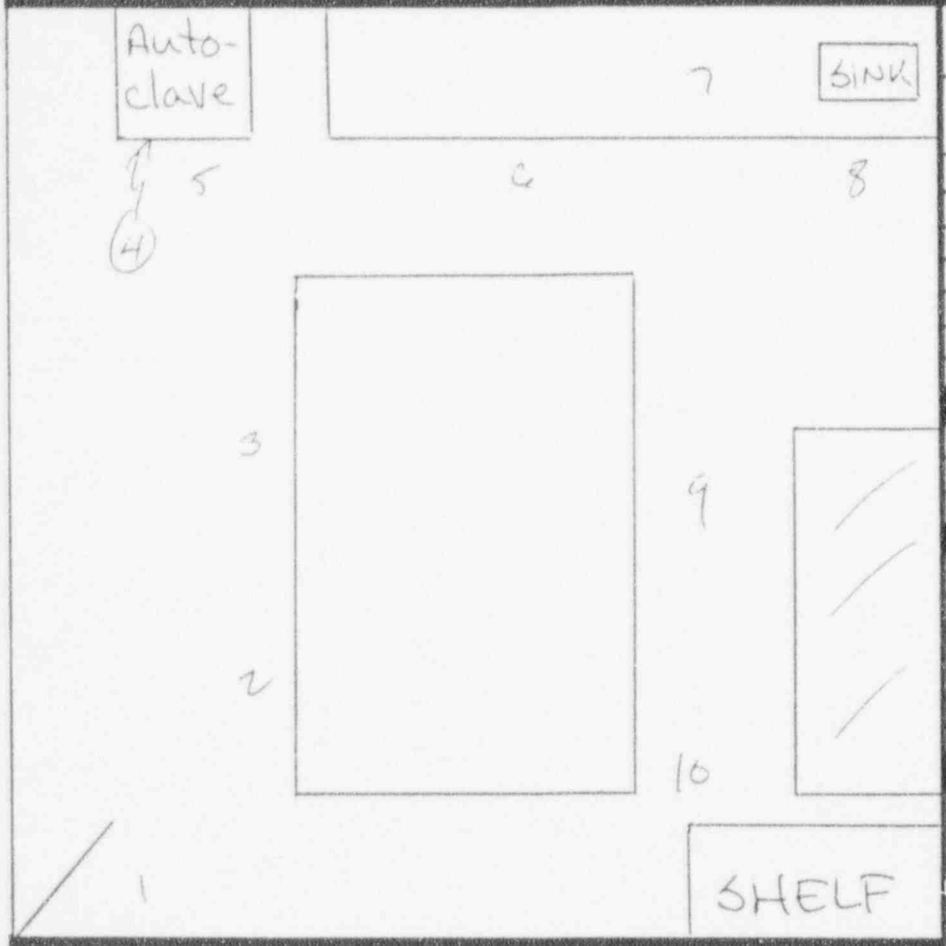
RADIATION SAFETY SURVEY

COMPANY NAME FDA

BLDG BRF

ROOM NO. 6

AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE NO.	DATE (month, day, year) 12-29-92
SURVEYOR	NAME (last, first initial) WATTS, C	PHONE NO.	SURVEY METER USED L3 w/ 44-9



SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100cm²)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 β	<100	⟶								
NUCLIDE 2										
NUCLIDE 3										

COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
✓		(1) Signs & labies : 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 coats
		(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
		(21) Corridor storage meets requirements
✓		(22) Radiation levels <2.5 mR/hr
✓		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
✓		(25) Survey meters operational
✓		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

METER 1	METER 2	METER 3

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

Rev. Oct 1990

ECOLOGY SERVICES, INC.

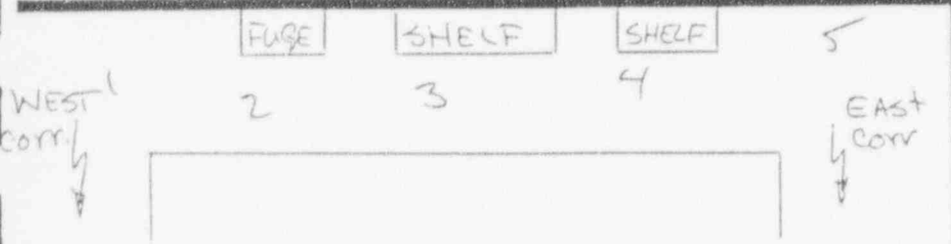
COMPANY NAME FDA

RADIATION SAFETY SURVEY

BLDG BRF

ROOM NO North Corr.

AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE NO.	DATE (month, day, year) 12-29-92
SURVEYOR	NAME (last, first initial) Watts, C	PHONE NO.	SURVEY METER USED B-144-9



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
		(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 coats
		(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
✓		(21) Corridor storage meets requirements.
✓		(22) Radiation levels < 2.5 mR/hr
✓		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
✓		(25) Survey meters operational
✓		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

METER 1	METER 2	METER 3

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 β	<100	→								
NUCLIDE 2										
NUCLIDE 3										

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

Rev. Oct 1990

ECOLOGY SERVICES, INC.

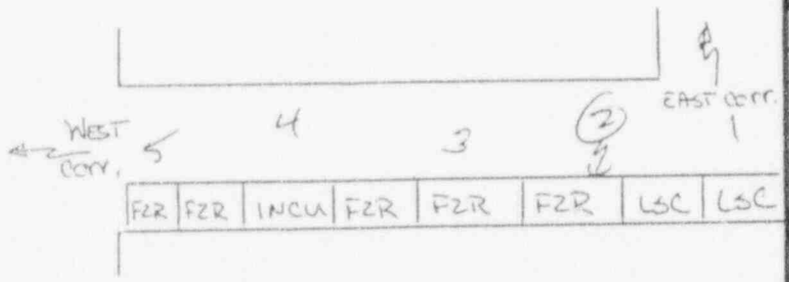
COMPANY NAME FDA

RADIATION SAFETY SURVEY

BLDG BRF

ROOM NO South Corr.

AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE NO.	DATE (month, day, year) 12-29-92
SURVEYOR	NAME (last, first initial) WATTS, C	PHONE NO.	SURVEY METER USED L3-1 44-9



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
		(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 coats
		(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
✓		(21) Corridor storage meets requirements
✓		(22) Radiation levels < 2.5 mR/hr
✓		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
✓		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

METER 1	METER 2	METER 3

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 β	<100	⟶								
NUCLIDE 2										
NUCLIDE 3										

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

Rev. Oct 1990

ECOLOGY SERVICES, INC.

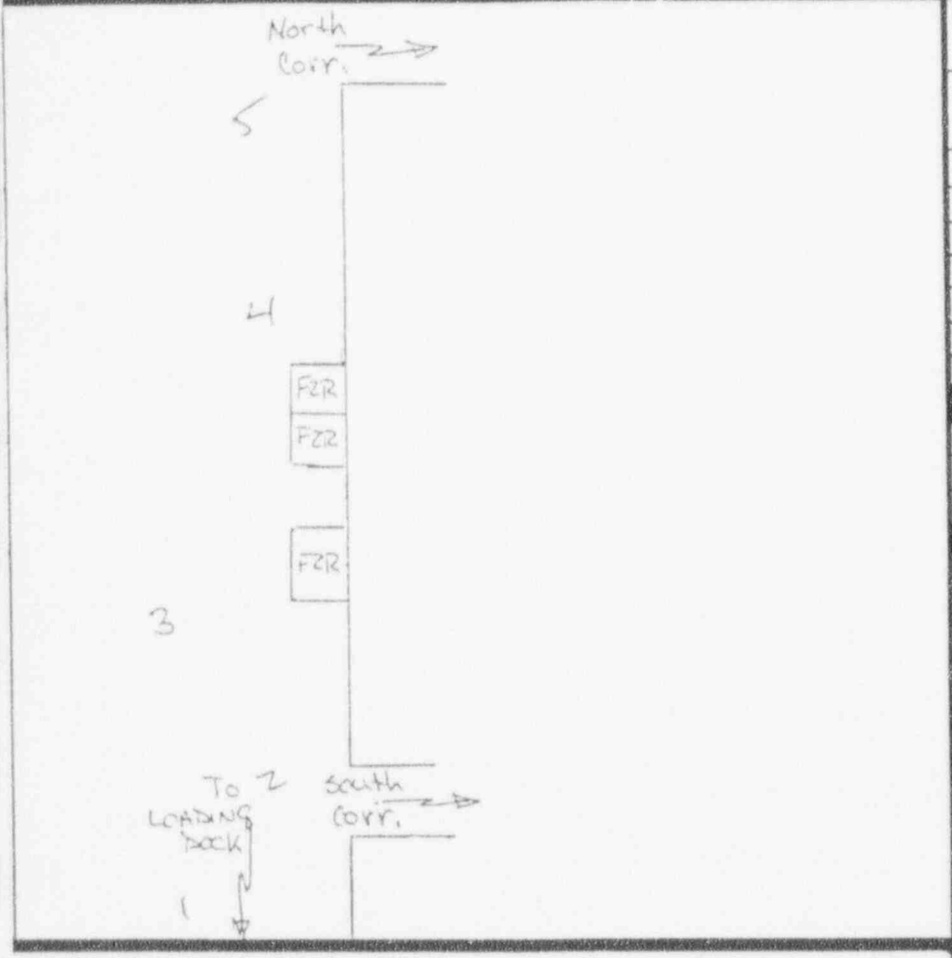
RADIATION SAFETY SURVEY

COMPANY NAME FDA

BLDG BRF

ROOM NO West Corr.

AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE NO.	DATE (month, day, year) 12-29-92
SURVEYOR	NAME (last, first initial) WATTS, C	PHONE NO.	SURVEY METER USED L3 w/ 44-9



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
		(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 coats
		(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
✓		(21) Corridor storage meets requirements
✓		(22) Radiation levels < 2.5 mR/hr
✓		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
✓		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

METER 1	METER 2	METER 3

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 β	<100	→	→	→	→					
NUCLIDE 2										
NUCLIDE 3										

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

Rev. Oct 1990

ECOLOGY SERVICES, INC.

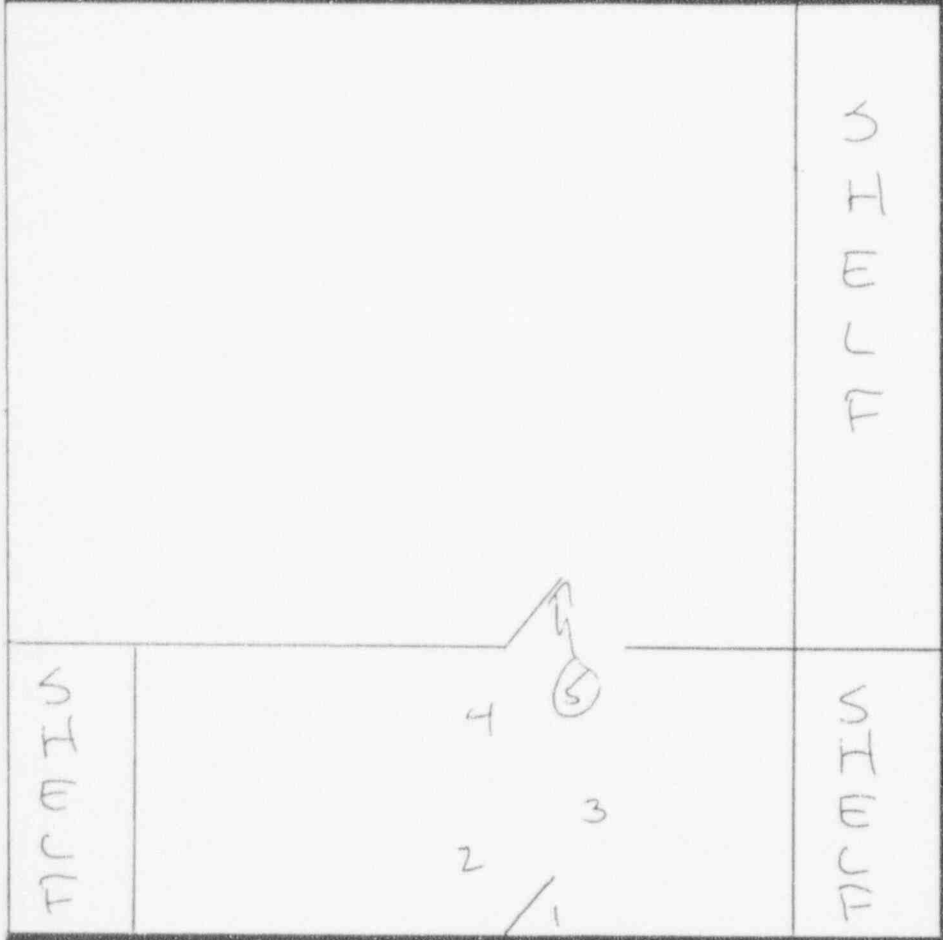
RADIATION SAFETY SURVEY

COMPANY NAME FDA

BLDG BRF

ROOM NO. Walk In Cold Rm

AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE NO.	DATE (month, day, year) 12-29-92
SURVEYOR	NAME (last, first initial) Watts, C	PHONE NO.	SURVEY METER USED Lud 44-9



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
✓		(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 coats
✓		(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
		(21) Corridor storage meets requirements
✓		(22) Radiation levels < 2.5 mR/hr
✓		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
✓		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 β	<100	⟶								
NUCLIDE 2										
NUCLIDE 3										

METER 1	METER 2	METER 3

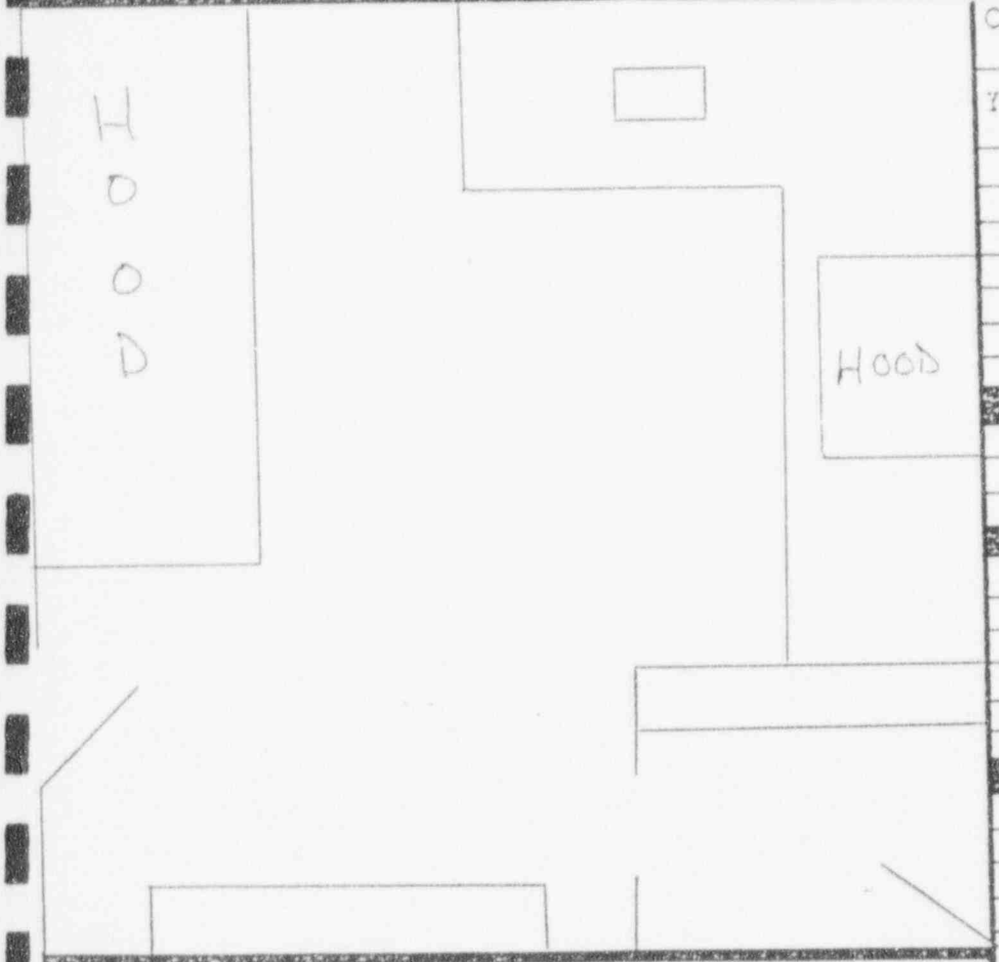
REMARKS : *(Refer to item No. . Include violations corrected by supervisor.)*

Rev. Oct 1990

ECOLOGY SERVICES, INC.

RADIATION SAFETY SURVEY

COMPANY NAME	FDA		
BLDG	CVM	ROOM NO.	103
AUTHORIZED INVESTIGATOR	NAME (last, first initial) Myers, M.	PHONE NO	DATE (month, day, year) 12-29-92
SURVEYOR	NAME (last, first initial) Watts C	PHONE NO.	SURVEY METER USED



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
		(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 coats
		(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
		(21) Corridor storage meets requirements
		(22) Radiation levels < 2.5 mR/hr
		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 3H										
NUCLIDE 2										
NUCLIDE 3										

METER 1	METER 2	METER 3

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

No RAM USE

Rev. Oct 1990

ECOLOGY SERVICES, INC.

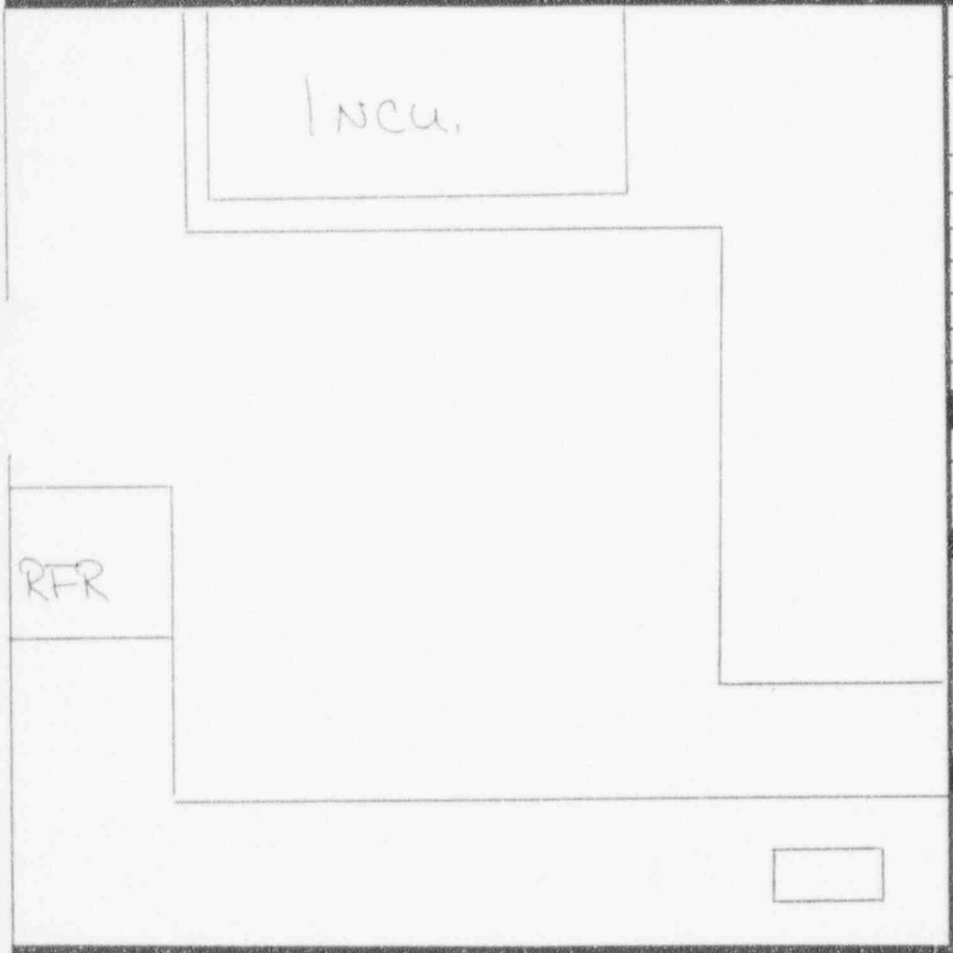
COMPANY NAME FDA

RADIATION SAFETY SURVEY

BLDG CVM

ROOM NO. 105

AUTHORIZED INVESTIGATOR	NAME (last, first initial) MYERS, M.	PHONE NO.	DATE (month, day, year) 12-29-92
SURVEYOR	NAME (last, first initial) WATTS, C	PHONE NO.	SURVEY METER USED



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
		(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 coats
		(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
		(21) Corridor storage meets requirements
		(22) Radiation levels < 2.5 mR/hr
		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 3H										
NUCLIDE 2										
NUCLIDE 3										

METER 1	METER 2	METER 3

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

No RAM Use

Rev. Oct 1990

ECOLOGY SERVICES, INC.

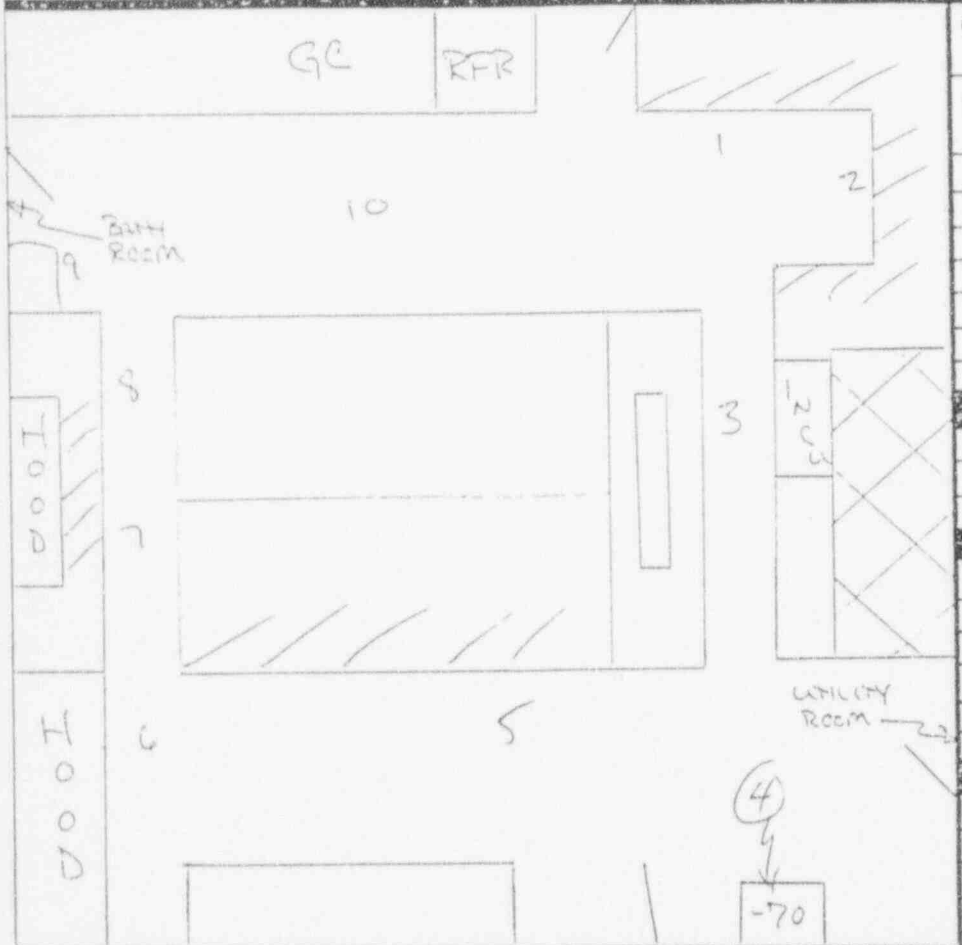
COMPANY NAME FDA

RADIATION SAFETY SURVEY

BLDG CVM-328

ROOM NO. N/A

AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE NO.	DATE (month, day, year) 12-29-92
SURVEYOR	NAME (last first initial) Watts, C	PHONE NO.	SURVEY METER USED N/A



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
✓		(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 coats
		(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
		(21) Corridor storage meets requirements
✓		(22) Radiation levels <2.5 mR/hr
✓		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 32P	<100									→
NUCLIDE 2										
NUCLIDE 3										

METER 1	METER 2	METER 3

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

Rev. Oct 990

ECOLOGY SERVICES, INC.

COMPANY NAME FDA

RADIATION SAFETY SURVEY

BLDG CYM

ROOM NO. 103

AUTHORIZED INVESTIGATOR

NAME (last, first initial) MYERS, M.

PHONE NO.

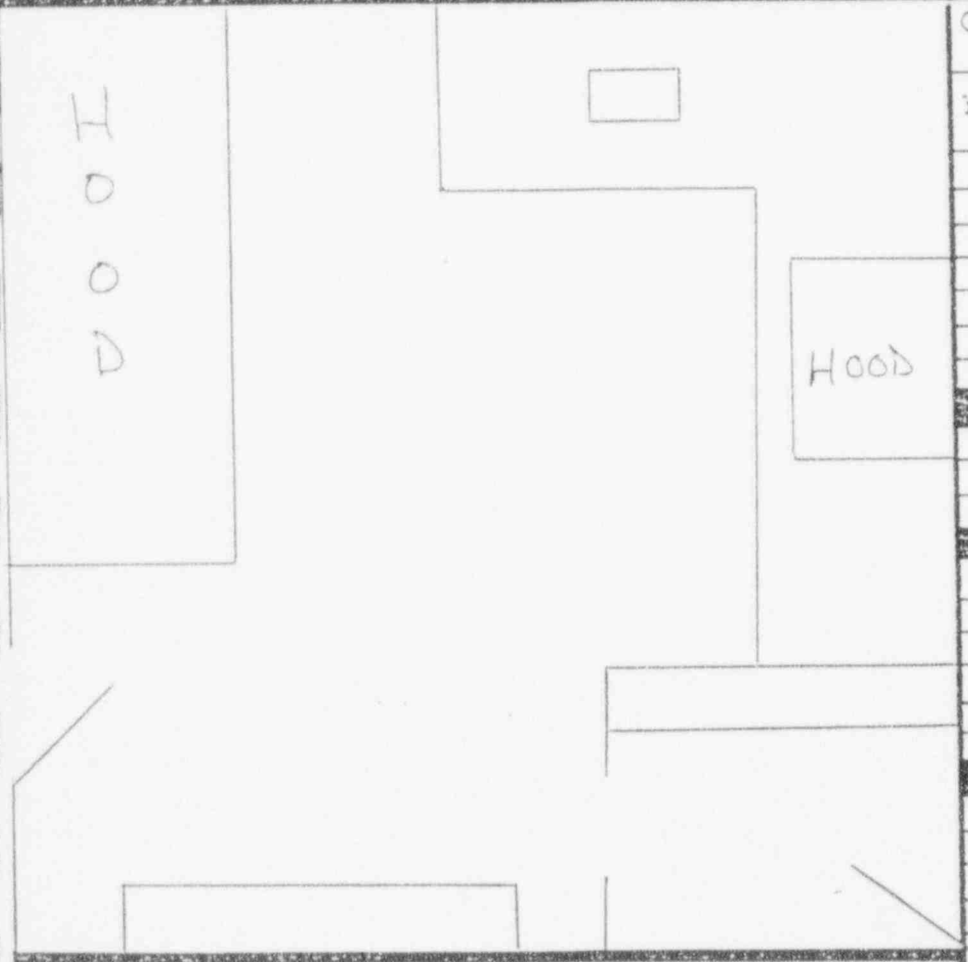
DATE (month, day, year) 11-17-92

SURVEYOR

NAME (last, first initial) WATTS, C

PHONE NO.

SURVEY METER USED N/A



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
		(1) Signs & lables : room
		(2) Source containers
		(3) Refrigerator/freezer
		(4) LSC vials
		(5) Waste containers
		(6) Other equipment
		(7) Absorbent 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 coats
		(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
		(21) Corridor storage meets requirements
		(22) Radiation levels <2.5 mR/hr
		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 3H										
NUCLIDE 2										
NUCLIDE 3										

METER 1	METER 2	METER 3

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

NO RAM USE

Rev. Oct 1990

ECOLOGY SERVICES, INC.

RADIATION SAFETY SURVEY

COMPANY NAME FDA

BLDG CVM

ROOM NO. 105

AUTHORIZED INVESTIGATOR NAME (last, first initial) MYERS, M.

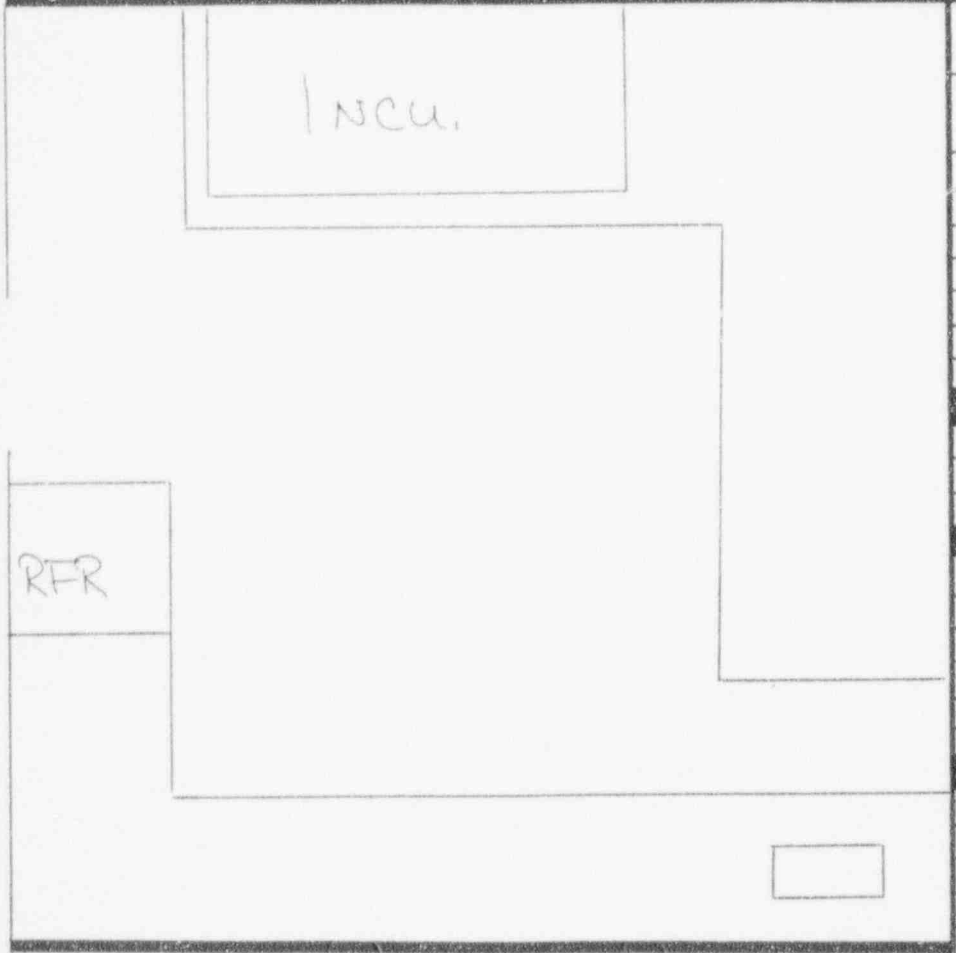
PHONE NO.

DATE (month, day, year) 11-17-92

SURVEYOR NAME (last, first initial) WATB, C

PHONE NO.

SURVEY METER USED N/A



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
		(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 coats
		(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
		(21) Corridor storage meets requirements
		(22) Radiation levels < 2.5 mR/hr
		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 3H										
NUCLIDE 2										
NUCLIDE 3										

METER 1	METER 2	METER 3

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

No RAM Use

Rev. Oct 1990

ECOLOGY SERVICES, INC.

COMPANY NAME FDA

RADIATION SAFETY SURVEY

BLDG CVM-328

ROOM NO. N/A

AUTHORIZED INVESTIGATOR NAME (last, first initial)

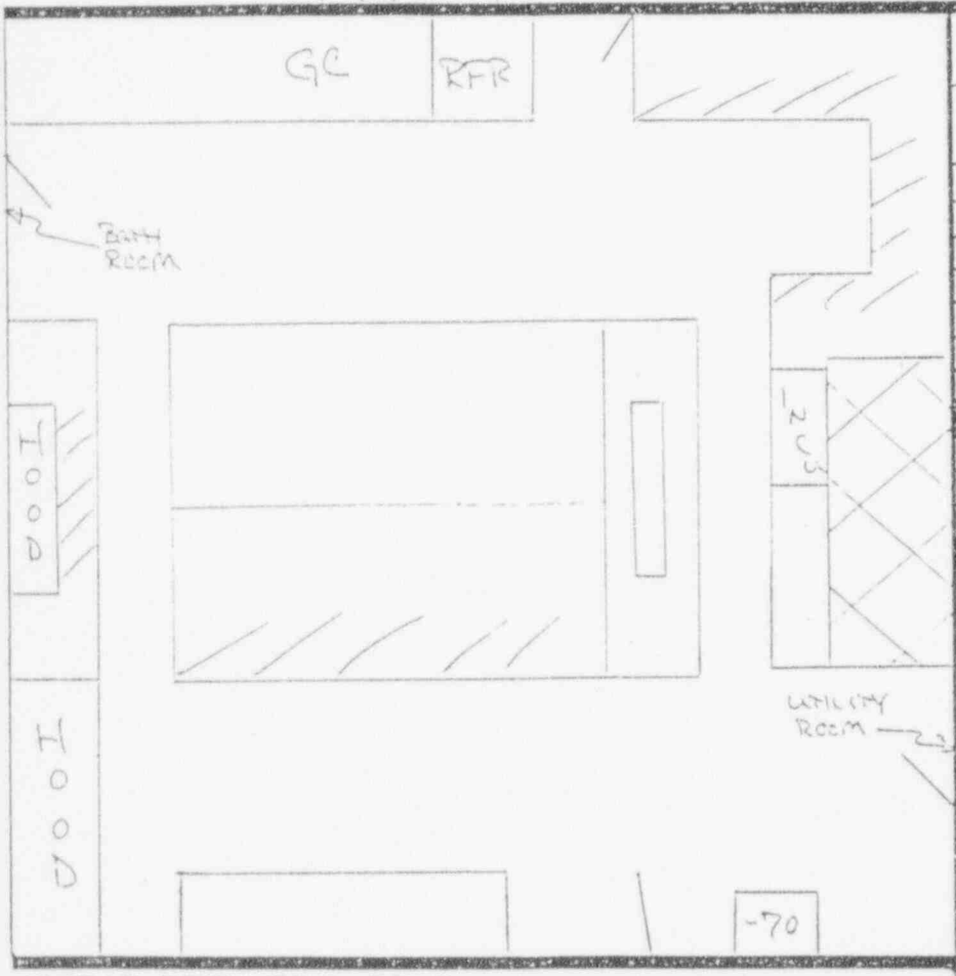
PHONE NO.

DATE (month, day, year) 11-17-92

SURVEYOR NAME (last first initial) WATTS, C

PHONE NO.

SURVEY METER USED N/A



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
		(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 coats
		(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
		(21) Corridor storage meets requirements
		(22) Radiation levels < 2.5 mR/hr
		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 β	<100									→
NUCLIDE 2										
NUCLIDE 3										

METER 1	METER 2	METER 3

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

LAB UNAVAILABLE FOR SURVEY

Rev. Oct 1990

ECOLOGY SERVICES, INC.

COMPANY NAME FDA

RADIATION SAFETY SURVEY

BLDG FB8

ROOM NO. 2266

AUTHORIZED INVESTIGATOR NAME (last, first initial)

PHONE NO.

DATE (month, day, year) 11-17-92

SURVEYOR NAME (last, first initial) WATTS, C

PHONE NO.

SURVEY METER USED N/A

COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
		(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 coats
		(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
		(21) Corridor storage meets requirements
		(22) Radiation levels < 2.5 mR/hr
		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1										
NUCLIDE 2										
NUCLIDE 3										

METER 1	METER 2	METER 3

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

No RAM Use

Rev. Oct 1990

ECOLOGY SERVICES, INC.

COMPANY NAME DA

RADIATION SAFETY SURVEY

BLDG FB8

ROOM NO. 3838

AUTHORIZED INVESTIGATOR NAME (last, first initial)

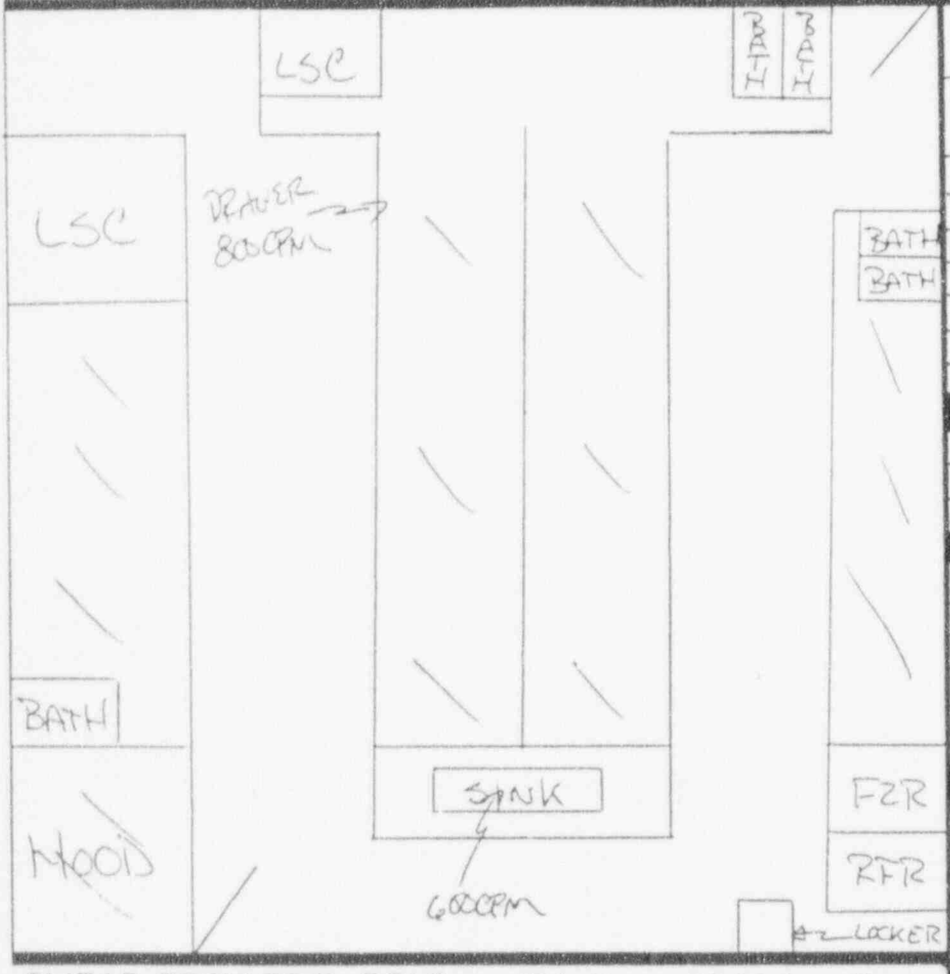
PHONE NO.

DATE (month, day, year) 11-17-92

SURVEYOR NAME (last, first initial) WATTS, C

PHONE NO.

SURVEY METER USED L3 ul 44-9



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y N

(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 coats
(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
(21) Corridor storage meets requirements
(22) Radiation levels <2.5 mR/hr
(23) Contamination (smears) < 100 dpm
(24) Calibration current
(25) Survey meters operational
(26) Survey meters available
(27) Other (SPECIFY IN REMARKS)

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm²)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 β	<100	→	→	→	→	→	→	→	→	→
NUCLIDE 2										
NUCLIDE 3										

METER 1	METER 2	METER 3

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

METER SN 86868 OUT OF CAL

DRAWER CONTAMINATED ; 2885 dpm/15cm²

SINK CONTAMINATED ; 2115 dpm/15cm²

Rev. Oct 1990

ECOLOGY SERVICES, INC.

RADIATION SAFETY SURVEY

COMPANY NAME	FDA		
BLDG	FB8	ROOM NO.	6446
AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE NO.	DATE (month, day, year) 11-17-92
SURVEYOR	NAME (last, first initial) Watts, C	PHONE NO.	SURVEY METER USED L3w/ 44-9

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 β	<100	→	→	→	→	→	→	→	→	→
NUCLIDE 2										
NUCLIDE 3										

COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
/		(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 coats
/		(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
		(21) Corridor storage meets requirements
/		(22) Radiation levels < 2.5 mR/hr
/		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
/		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

METER 1	METER 2	METER 3

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

Rev. Oct 1990

ECOLOGY SERVICES, INC.

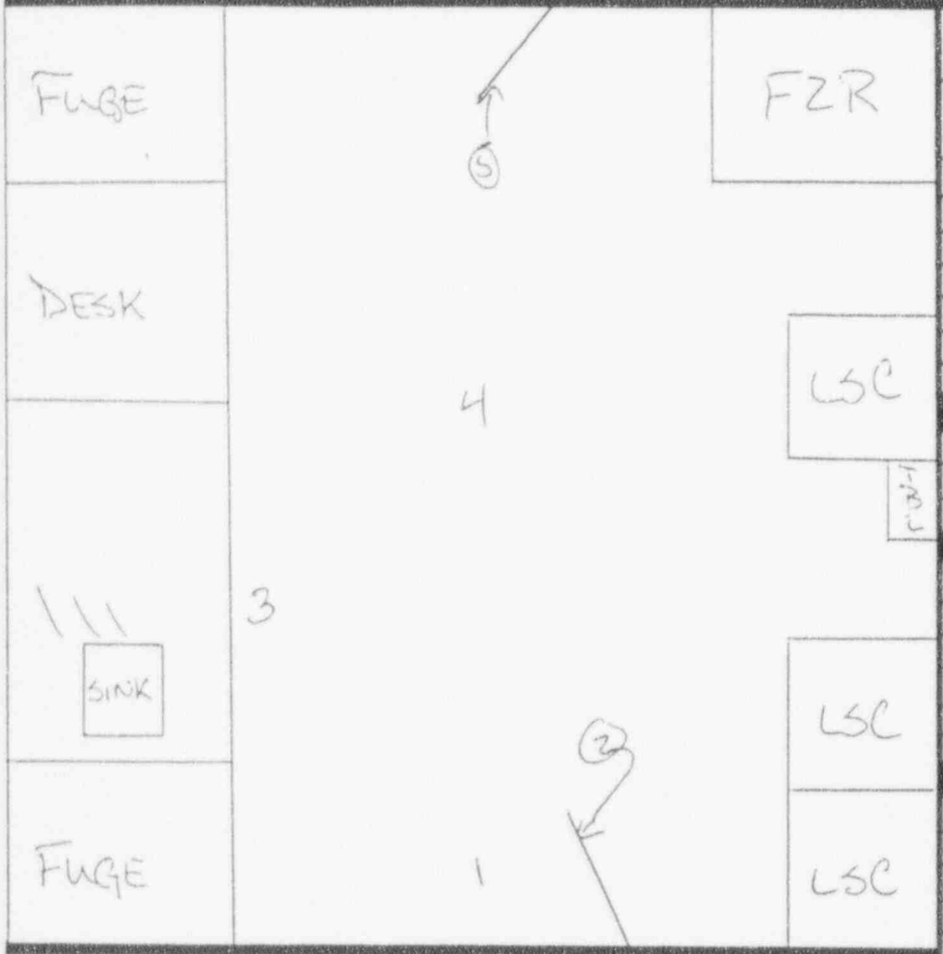
RADIATION SAFETY SURVEY

COMPANY NAME FDA

BLDG FB8

ROOM NO. 6448

AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE NO.	DATE (month, day, year) 11-17-92
SURVEYOR	NAME (last, first initial) WATTS, C	PHONE NO.	SURVEY METER USED L3 w/ 44-9



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
✓		(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 coats
✓		(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
		(21) Corridor storage meets requirements
✓		(22) Radiation levels < 2.5 mR/hr
✓		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
✓		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

METER 1	METER 2	METER 3

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 β	<10	→								
NUCLIDE 2										
NUCLIDE 3										

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

Rev. Oct 1990

ECOLOGY SERVICES, INC.

RADIATION SAFETY SURVEY

COMPANY NAME FDA

BLDG FB8

ROOM NO. 6846

AUTHORIZED INVESTIGATOR NAME (last, first initial)

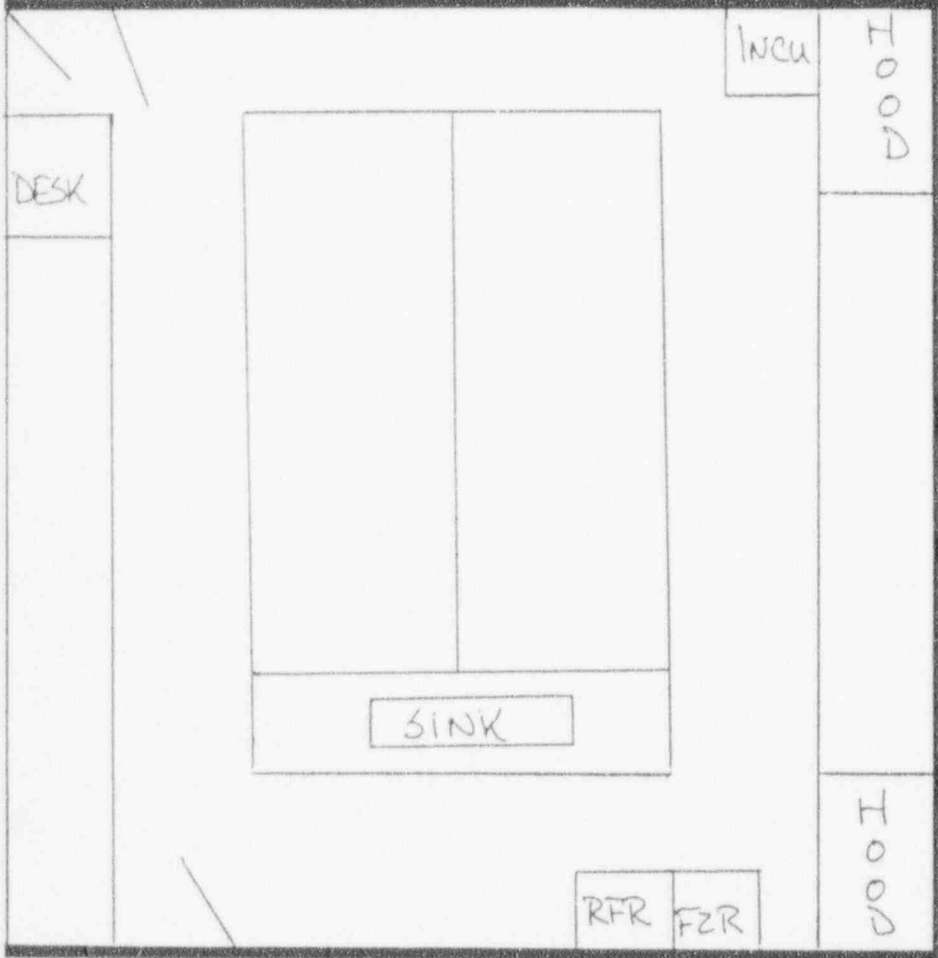
PHONE NO.

DATE (month, day, year) 11-17-92

SURVEYOR NAME (last, first initial) WATTS C

PHONE NO.

SURVEY METER USED N/A



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
		(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 coats
		(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
		(21) Corridor storage meets requirements
		(22) Radiation levels < 2.5 mR/hr
		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1										
NUCLIDE 2										
NUCLIDE 3										

METER 1	METER 2	METER 3

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

No RAM Use

Rev. Oct 1990

ECOLOGY SERVICES, INC.

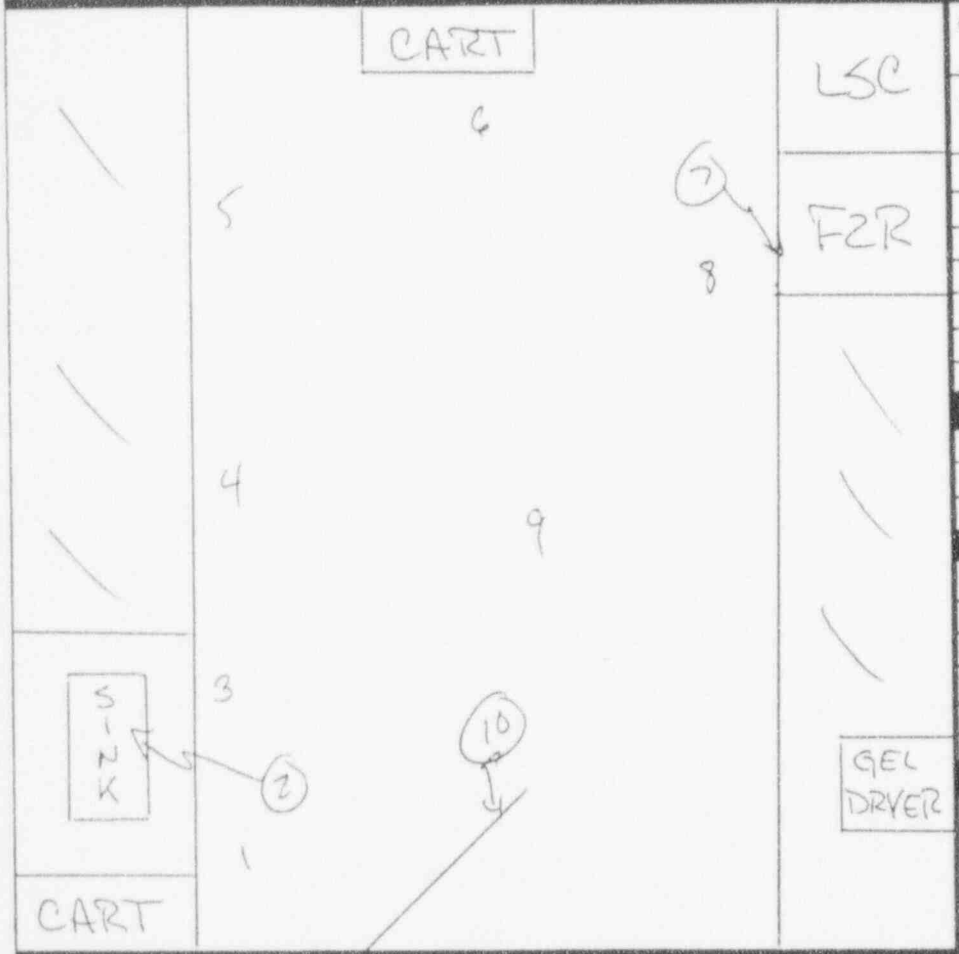
COMPANY NAME FDA

RADIATION SAFETY SURVEY

BLDG FB8

ROOM NO. 3756

AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE NO.	DATE (month, day, year) 11-17-92
SURVEYOR	NAME (last, first initial) WATTS, C	PHONE NO.	SURVEY METER USED L3 w/ 44-9



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
✓		(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 coats
✓		(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
		(21) Corridor storage meets requirements
✓		(22) Radiation levels < 2.5 mR/hr
✓		(23) Contamination (smears) < 100 dpm
✓		(24) Calibration current
✓		(25) Survey meters operational
✓		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

METER 1	METER 2	METER 3

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 β	<100	—	—	—	—	—	—	—	—	→
NUCLIDE 2										
NUCLIDE 3										

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

METER SN 8000 OUT OF CAL

Rev. Oct 1990

ECOLOGY SERVICES, INC.

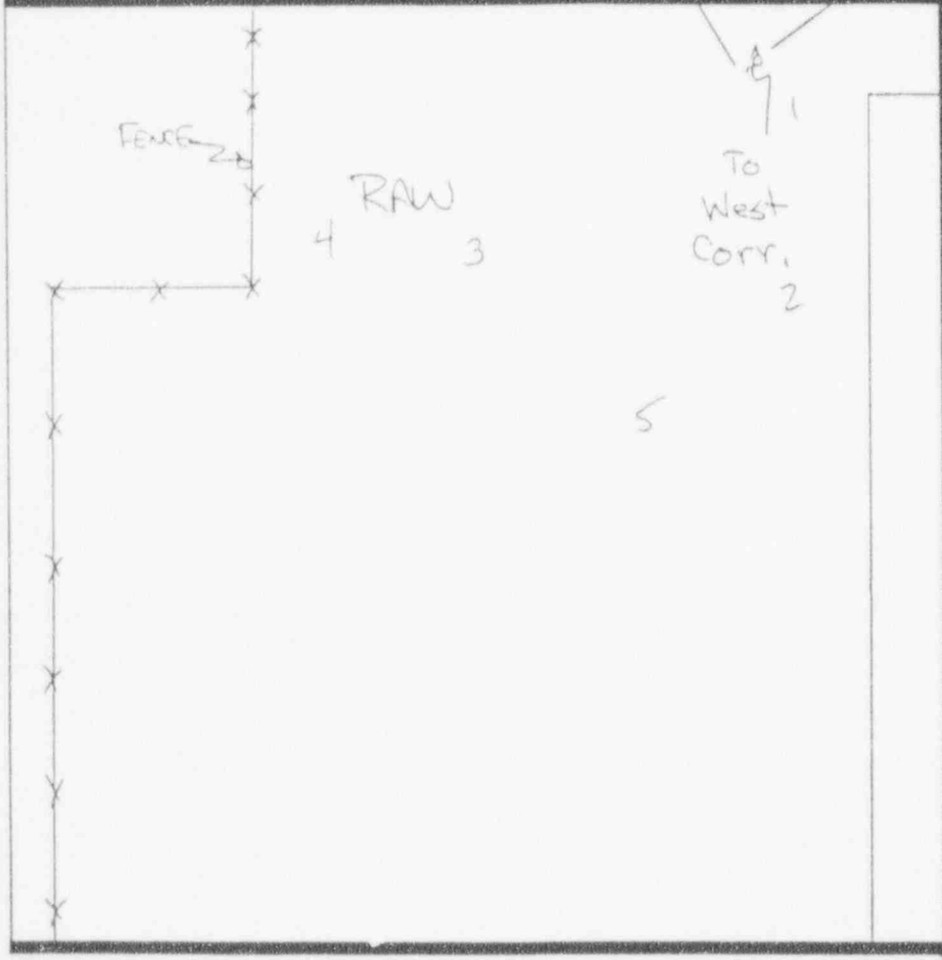
COMPANY NAME FDA

RADIATION SAFETY SURVEY

BLDG BRF

ROOM NO. LOADING Dock

AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE NO.	DATE (month, day, year) 11-17-92
SURVEYOR	NAME (last, first initial) WATTS, C	PHONE NO.	SURVEY METER USED L3 w/ 44-9



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
		(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 coats
		(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
		(21) Corridor storage meets requirements
✓		(22) Radiation levels < 2.5 mR/hr
✓		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
✓		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

METER 1	METER 2	METER 3

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
~~NUCLIDE 1~~ φ	<100		——	——	→					
NUCLIDE 2										
NUCLIDE 3										

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

Rev. Oct 1990

ECOLOGY SERVICES, INC.
300 Second St., Laurel, Maryland 207
(301) 498-1514

Company Name: FDA

RADIATION SAFETY SURVEY

Building / Room: BRF / LAB 18

Authorized Investigator: NAME:

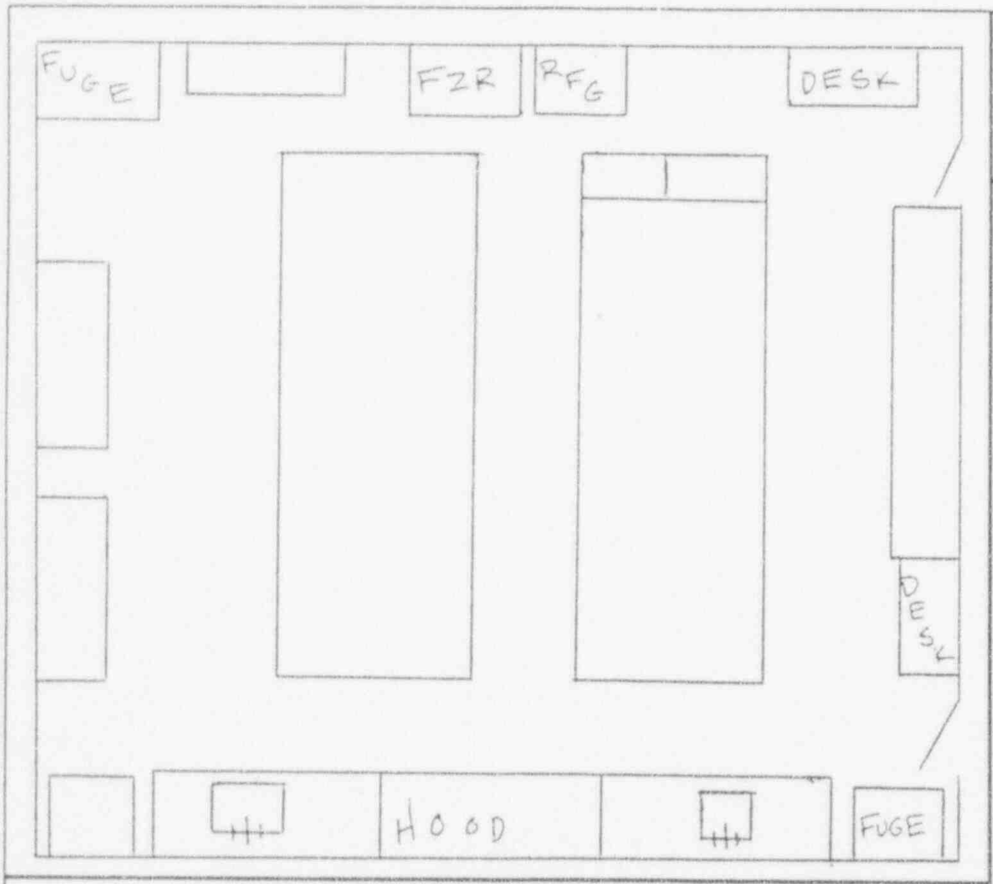
Phone No.

Date: 11-17-92

Surveyor: NAME: WATTS, C

Phone No.

Survey Meter Used: L3 w/ 44-9



Compliance Items: Y - Compliance
N - Non-Compliance
Blank - Not Evaluated

Y N
☐ ☐

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, etc.
☐ ☐ Inventory & Disposal Records
☐ ☐ Survey Records Current
☐ ☐ Personnel Trained
☐ ☐ Prohibition on Mouth Pipetting
☐ ☐ Radiation Levels
☐ ☐ Contamination (Wipes) < 100 DPM/100 sq. cm.

Survey Instrument:

☐ ☐ Calibration Current
☐ ☐ Operational
☐ ☐ Available
☐ ☐ Other (Specify in Comments)

Wipe Sample Results:

LOCATION:	1	2	3	4	5	6	7	8	9	10
Nuclide 1 3										
Nuclide 2										
Nuclide 3										
Nuclide 4										

Note: All wipe sample results are in units of DPM / 100 sq. cm.

Comments:

NO RAM USE

ESI Form HPS 1 Rev 1.0 1/92

ECOLOGY SERVICES, INC.

COMPANY NAME FDA

RADIATION SAFETY SURVEY

BLDG BRF

ROOM NO. 6

AUTHORIZED INVESTIGATOR NAME (last, first initial)

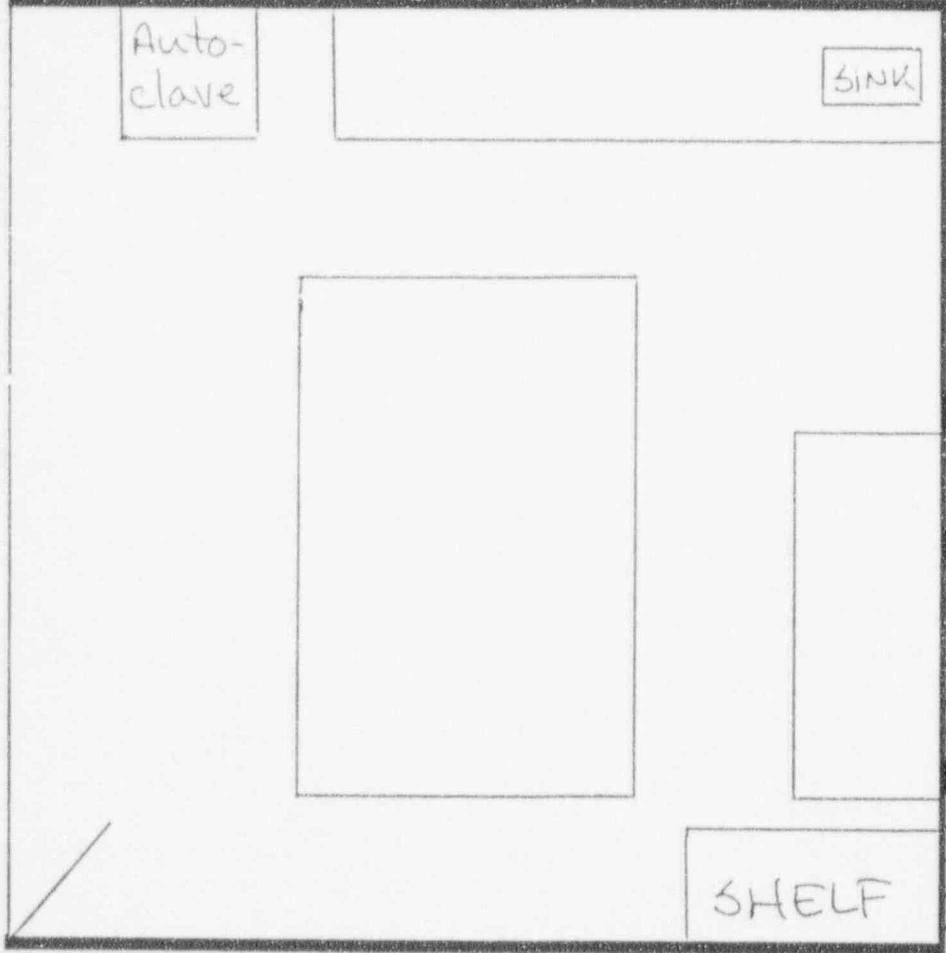
PHONE NO.

DATE (month, day, year) 11-17-92

SURVEYOR NAME (last, first initial) WATTS, C

PHONE NO.

SURVEY METER USED N/A



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
		(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 coats
		(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
		(21) Corridor storage meets requirements
		(22) Radiation levels < 2.5 mR/hr
		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1										
NUCLIDE 2										
NUCLIDE 3										

METER 1	METER 2	METER 3

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

LAB NOT AVAILABLE FOR SURVEY

Rev. Oct 1990

ECOLOGY SERVICES, INC.

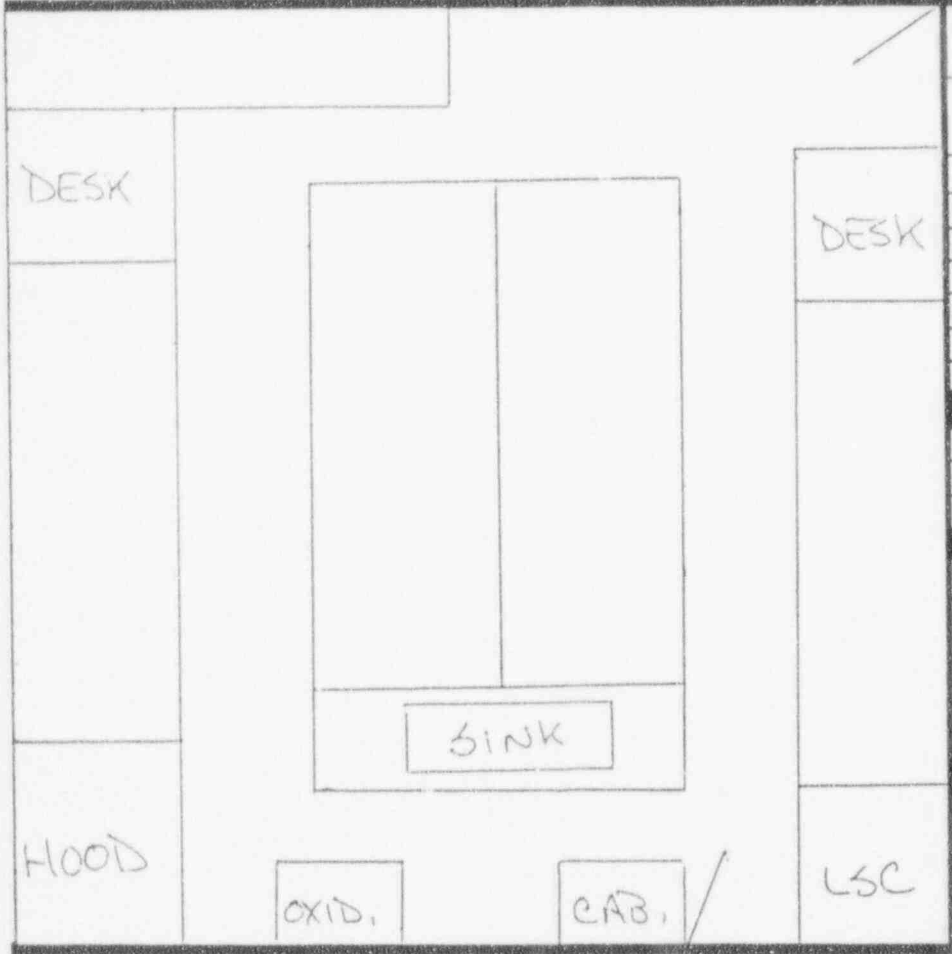
COMPANY NAME FDA

RADIATION SAFETY SURVEY

BLDG BRF

ROOM NO. 14

AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE NO.	DATE (month, day, year) 11-17-92
SURVEYOR	NAME (last, first initial) Watts, C	PHONE NO.	SURVEY METER USED N/A



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
		(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 coats
		(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
		(21) Corridor storage meets requirements
		(22) Radiation levels < 2.5 mR/hr
		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1										
NUCLIDE 2										
NUCLIDE 3										

METER 1	METER 2	METER 3

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

No RAM Use

Rev. Oct 1990

ECOLOGY SERVICES, INC.

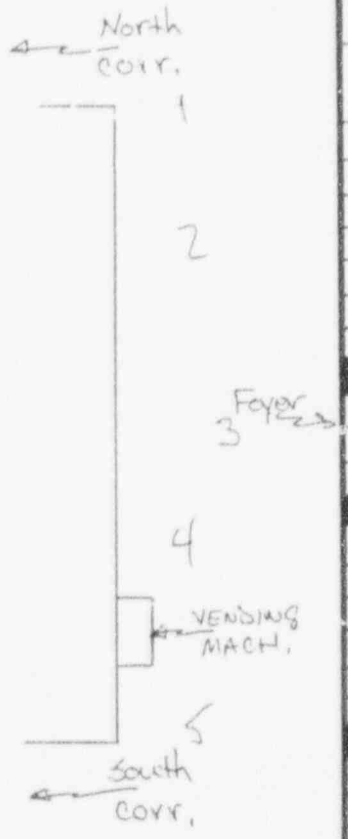
COMPANY NAME FDA

RADIATION SAFETY SURVEY

BLDG BRF

ROOM NO. East Corr.

AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE NO.	DATE (month, day, year) 11-17-92
SURVEYOR	NAME (last, first initial) Watts, C	PHONE NO.	SURVEY METER USED L3 w/ 44-9



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
		(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 coats
		(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
✓		(21) Corridor storage meets requirements
✓		(22) Radiation levels < 2.5 mR/hr
✓		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
✓		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

METER 1	METER 2	METER 3

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 P	<100	→	→	→	→					
NUCLIDE 2										
NUCLIDE 3										

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

Rev. Oct 1990

ECOLOGY SERVICES, INC.

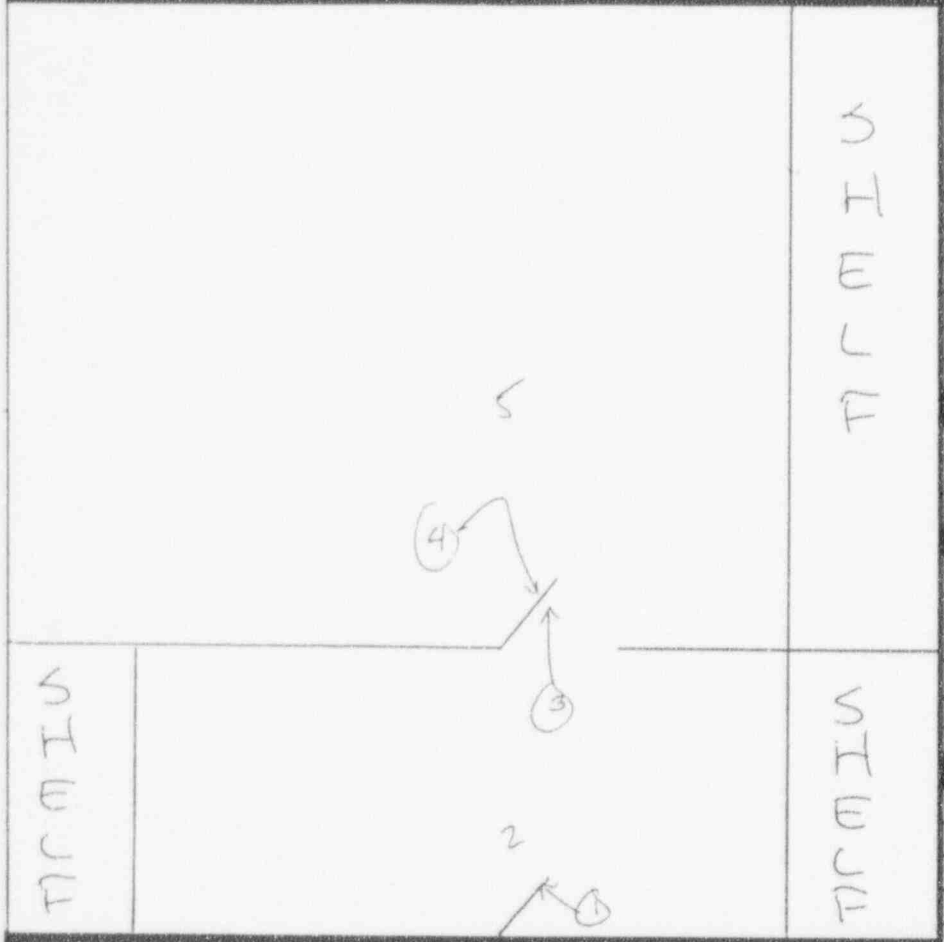
COMPANY NAME FDA

RADIATION SAFETY SURVEY

BLDG BRF

ROOM NO. Walk In Cold Rm

AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE NO.	DATE (month, day, year) 11-17-92
SURVEYOR	NAME (last, first initial) WATTS, C	PHONE NO.	SURVEY METER USED L3 w/ 44-9



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
✓		(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 coats
		(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
		(21) Corridor storage meets requirements
✓		(22) Radiation levels <2.5 mR/hr
✓		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
✓		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 ³H	<10	→	→	→	→					
NUCLIDE 2										
NUCLIDE 3										

METER 1	METER 2	METER 3

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

Rev. Oct 1990

ECOLOGY SERVICES, INC.

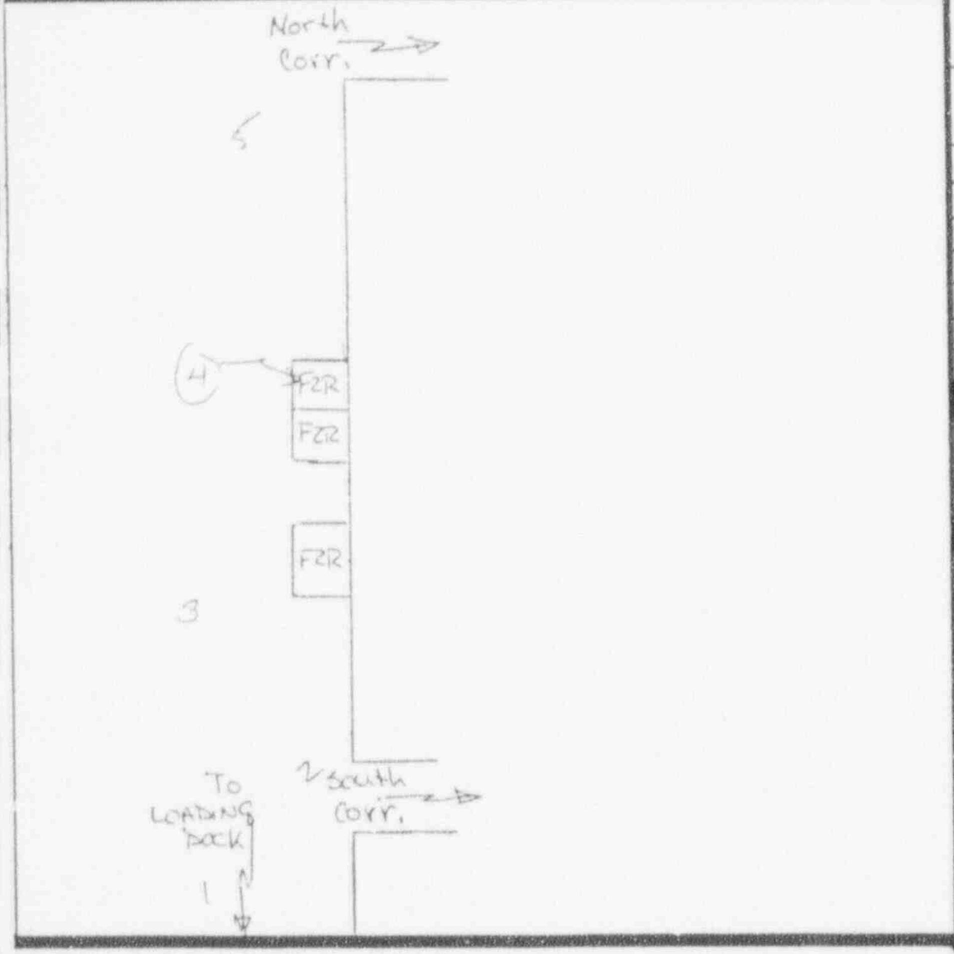
RADIATION SAFETY SURVEY

COMPANY NAME FDA

BLDG BRF

ROOM NO West Corr.

AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE NO.	DATE (month, day, year) 11-17-92
SURVEYOR	NAME (last, first initial) Watts, C	PHONE NO.	SURVEY METER USED L3 w/ 44-9



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
		(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 coats
		(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
✓		(21) Corridor storage meets requirements
✓		(22) Radiation levels < 2.5 mR/hr
✓		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
✓		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 P	<100	→	→	→	→					
NUCLIDE 2										
NUCLIDE 3										

METER 1	METER 2	METER 3

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

Rev. Oct 1990

ECOLOGY SERVICES, INC.

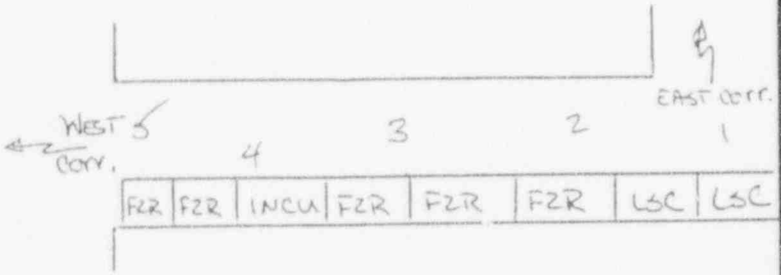
COMPANY NAME FDA

RADIATION SAFETY SURVEY

BLDG. BRF

ROOM NO. South Corr.

AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE NO.	DATE (month, day, year) 11-17-92
SURVEYOR	NAME (last, first initial) WATTS, C	PHONE NO.	SURVEY METER USED 3 w/ 44-9



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
		(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 coats
		(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
✓		(21) Corridor storage meets requirements
✓		(22) Radiation levels < 2.5 mR/hr
✓		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
✓		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE β	<100	→	→	→	→					
NUCLIDE 2										
NUCLIDE 3										

METER 1	METER 2	METER 3

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

Rev. Oct 1990

ECOLOGY SERVICES, INC.

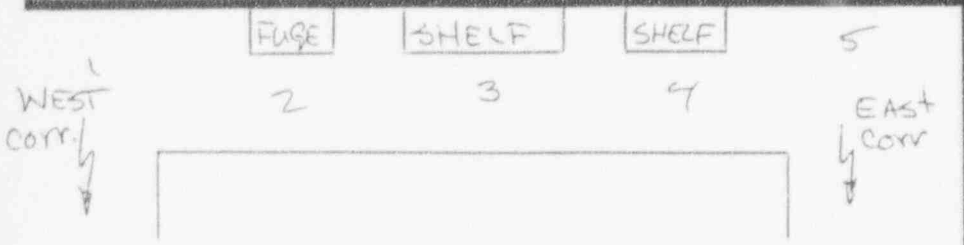
COMPANY NAME FDA

RADIATION SAFETY SURVEY

BLDG BRF

ROOM NO North Corr.

AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE NO.	DATE (month, day, year) 11-17-92
SURVEYOR	NAME (last, first initial) WATTS, C	PHONE NO.	SURVEY METER USED L3 w/ 44-9



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
		(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 coats
		(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
✓		(21) Corridor storage meets requirements
✓		(22) Radiation levels < 2.5 mR/hr
✓		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
✓		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm²)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 ³²P	<100	→	→	→	→					
NUCLIDE 2										
NUCLIDE 3										

METER 1	METER 2	METER 3

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

Rev. Oct 1990

ECOLOGY SERVICES, INC.

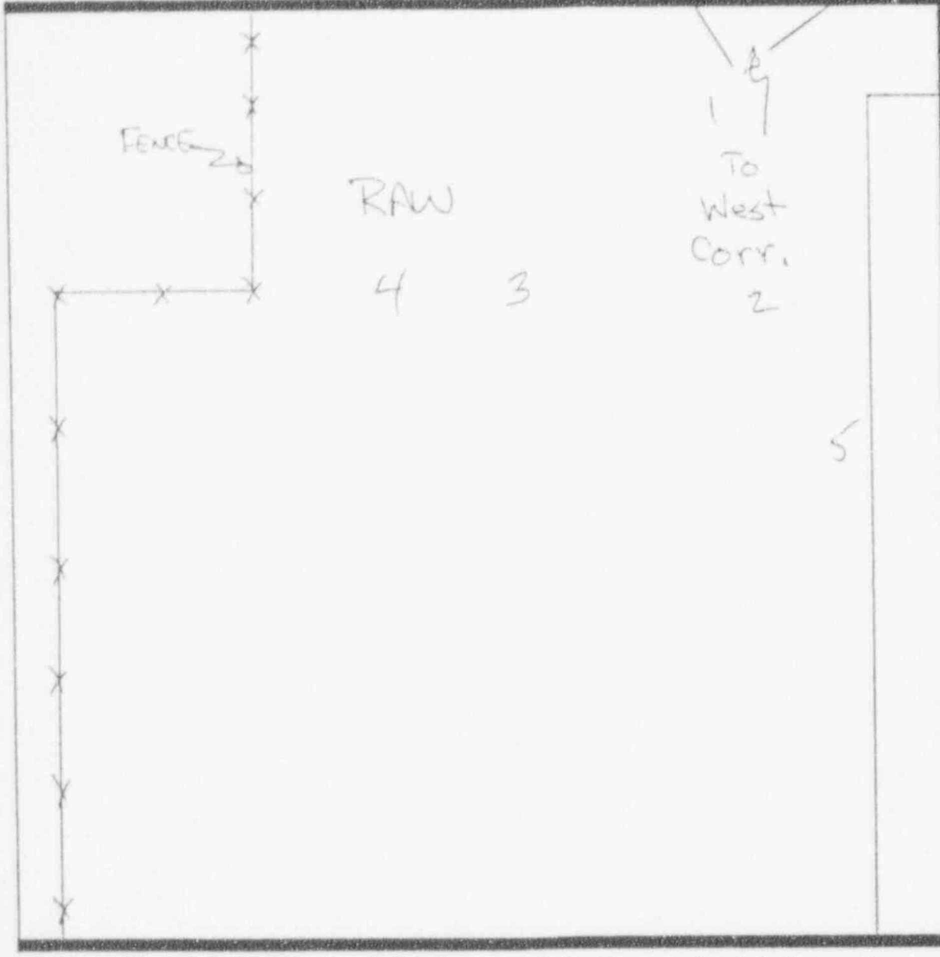
COMPANY NAME FDA

RADIATION SAFETY SURVEY

BLDG BRF

ROOM NO. LOADING Dock

AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE NO.	DATE (month, day, year) 10-19-92
SURVEYOR	NAME (last, first initial) WATTS, C	PHONE NO.	SURVEY METER USED L3 w/ 44-9



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
✓		(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 coats
✓		(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
✓		(21) Corridor storage meets requirements
✓		(22) Radiation levels <2.5 mR/hr
✓		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

METER 1	METER 2	METER 3

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 β	<100	⟶								
NUCLIDE 2										
NUCLIDE 3										

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

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ECOLOGY SERVICES, INC.

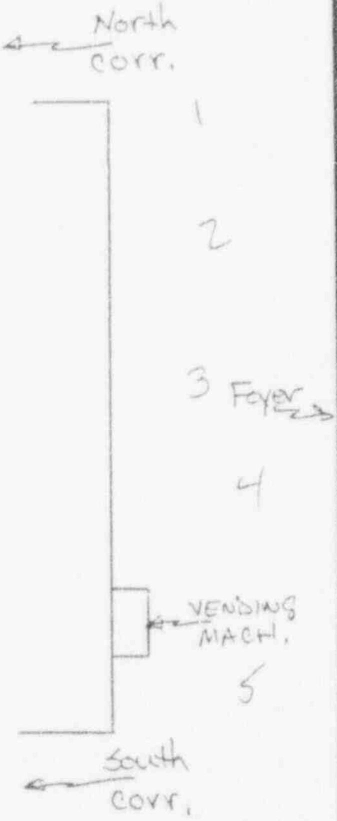
RADIATION SAFETY SURVEY

COMPANY NAME FDA

BLDG BRF

ROOM NO East Corr.

AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE NO.	DATE (month, day, year) 10-19-92
SURVEYOR	NAME (last, first initial) WATTS, C	PHONE NO.	SURVEY METER USED 13 w/ 44-9



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
		(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 coats
		(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
		(21) Corridor storage meets requirements
		(22) Radiation levels <2.5 mR/hr
		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

METER 1	METER 2	METER 3

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm²)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 P	<100	→	→	→	→					
NUCLIDE 2										
NUCLIDE 3										

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

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ECOLOGY SERVICES, INC.

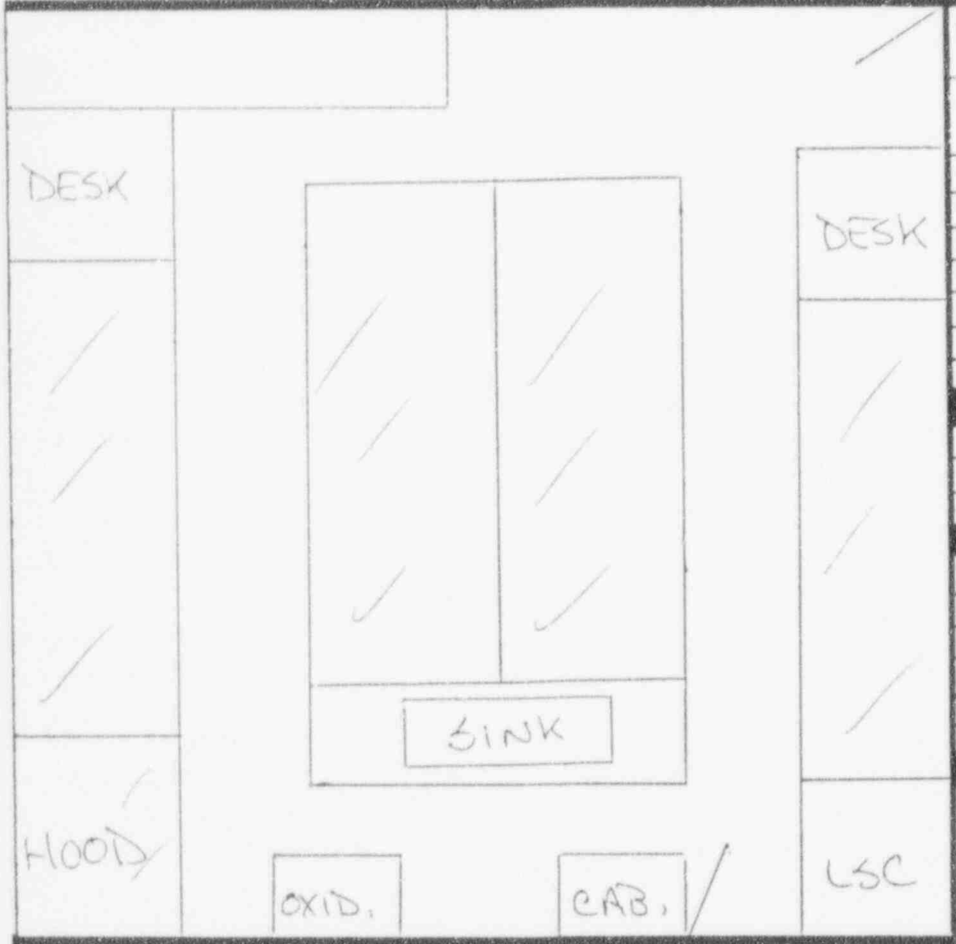
RADIATION SAFETY SURVEY

COMPANY NAME FDA

BLDG BRF

ROOM NO. 14

AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE NO.	DATE (month, day, year) 10-19-92
SURVEYOR	NAME (last, first initial) WATTS, C	PHONE NO.	SURVEY METER USED L3 w 44-9



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
		(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 coats
		(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
		(21) Corridor storage meets requirements
		(22) Radiation levels <2.5 mR/hr
		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 ^{14}C	<100									
NUCLIDE 2										
NUCLIDE 3										

METER 1	METER 2	METER 3

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

No RAM Use

Rev. Oct 1990

ECOLOGY SERVICES, INC.

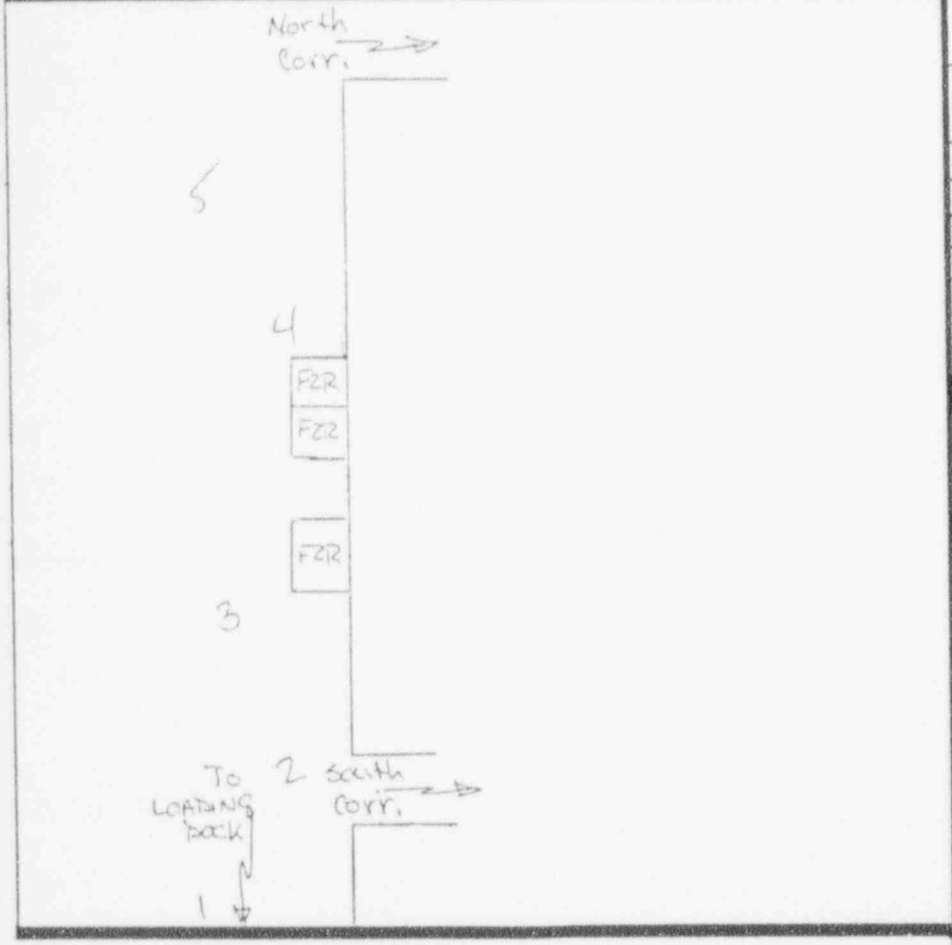
RADIATION SAFETY SURVEY

COMPANY NAME FDA

BLDG BRF

ROOM NO West Corr.

AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE NO.	DATE (month, day, year) 10-14-92
SURVEYOR	NAME (last, first initial) WATTS, C.	PHONE NO.	SURVEY METER USED L3 w/ 44-9



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
✓		(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 coats
✓		(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
		(21) Corridor storage meets requirements
✓		(22) Radiation levels <2.5 mR/hr
		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm²)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 β	<100	→	→	→	→					
NUCLIDE 2										
NUCLIDE 3										

METER 1	METER 2	METER 3

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

Rev. Oct 1990

ECOLOGY SERVICES, INC.

COMPANY NAME FDA

RADIATION SAFETY SURVEY

BLDG. BRF

ROOM NO. Walk In Cold Rm

AUTHORIZED INVESTIGATOR NAME (last, first initial)

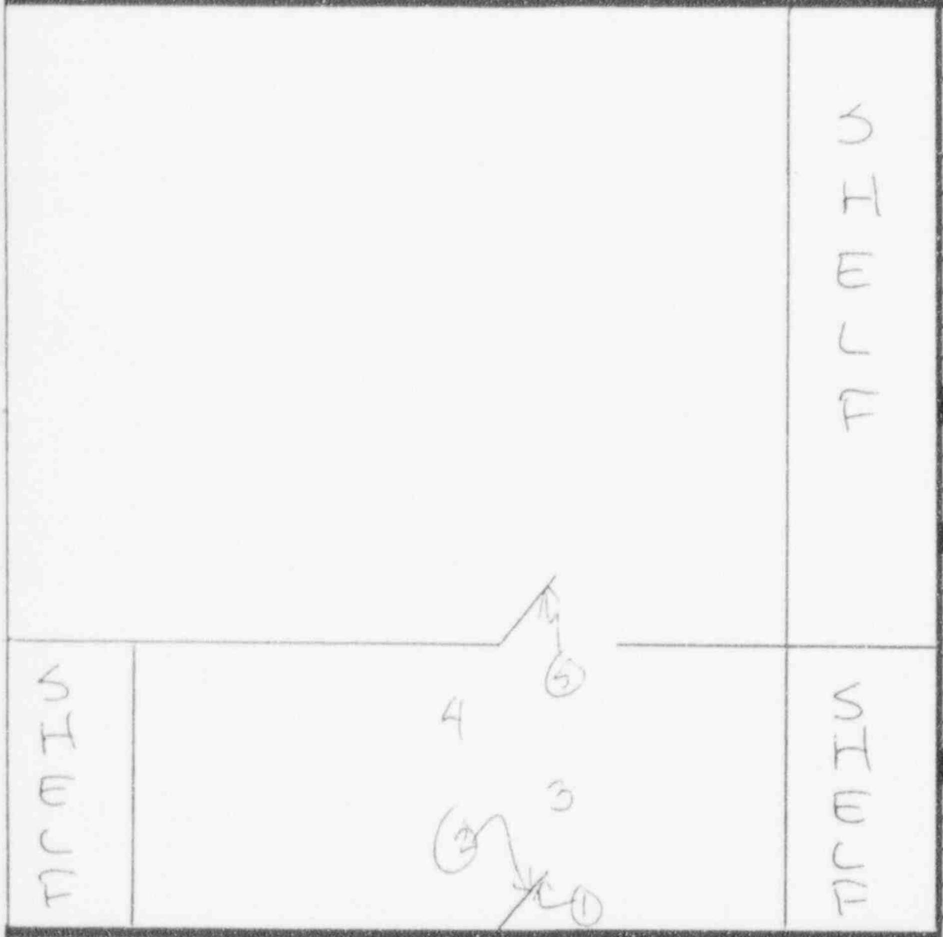
PHONE NO.

DATE (month, day, year) 10-19-92

SURVEYOR NAME (last, first initial) WATTS, C

PHONE NO.

SURVEY METER USED 13 w/ 44-9



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
✓		(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 coats
✓		(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
		(21) Corridor storage meets requirements
✓		(22) Radiation levels < 2.5 mR/hr
✓		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 β	<100	→								
NUCLIDE 2										
NUCLIDE 3										

METER 1	METER 2	METER 3

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

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ECOLOGY SERVICES, INC.

COMPANY NAME FDA

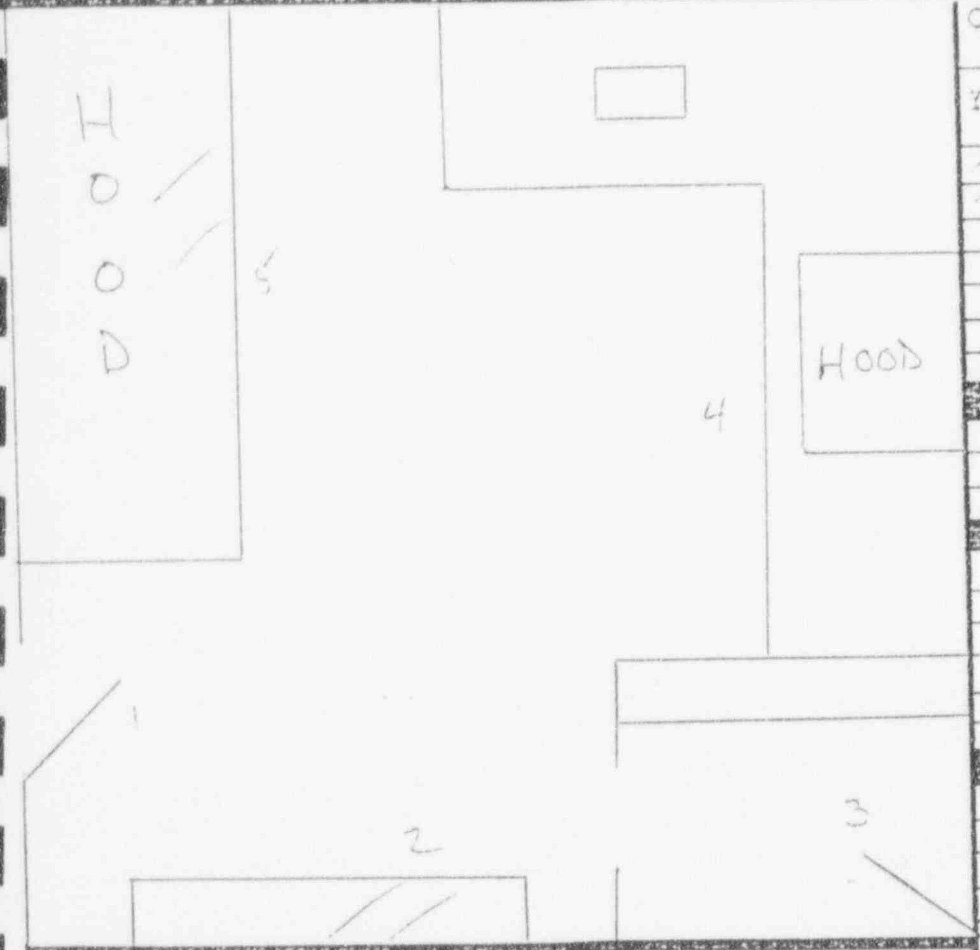
RADIATION SAFETY SURVEY

BLDG CVM

ROOM NO. 103

AUTHORIZED INVESTIGATOR — NAME (last, first initial) Myers, M. — PHONE NO. — DATE (month, day, year) 10-19-92

SURVEYOR — NAME (last, first initial) Watts C — PHONE NO. — SURVEY METER USED L3 ul 44-3



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
✓		(1) Signs & lables : room
✓		(2) Source containers
	✓	(3) Refrigerator/freezer
	✓	(4) LSC vials
	✓	(5) Waste containers
	✓	(6) Other equipment
✓		(7) Absorbent 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 coats
		(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
✓		(21) Corridor storage meets requirements
	✓	(22) Radiation levels <2.5 mR/hr
		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 3H	<100	—	—	—	>					
NUCLIDE 2 125I	<100	- - -	- - -	- - -	>					
NUCLIDE 3										

METER 1	METER 2	METER 3

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

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ECOLOGY SERVICES, INC.

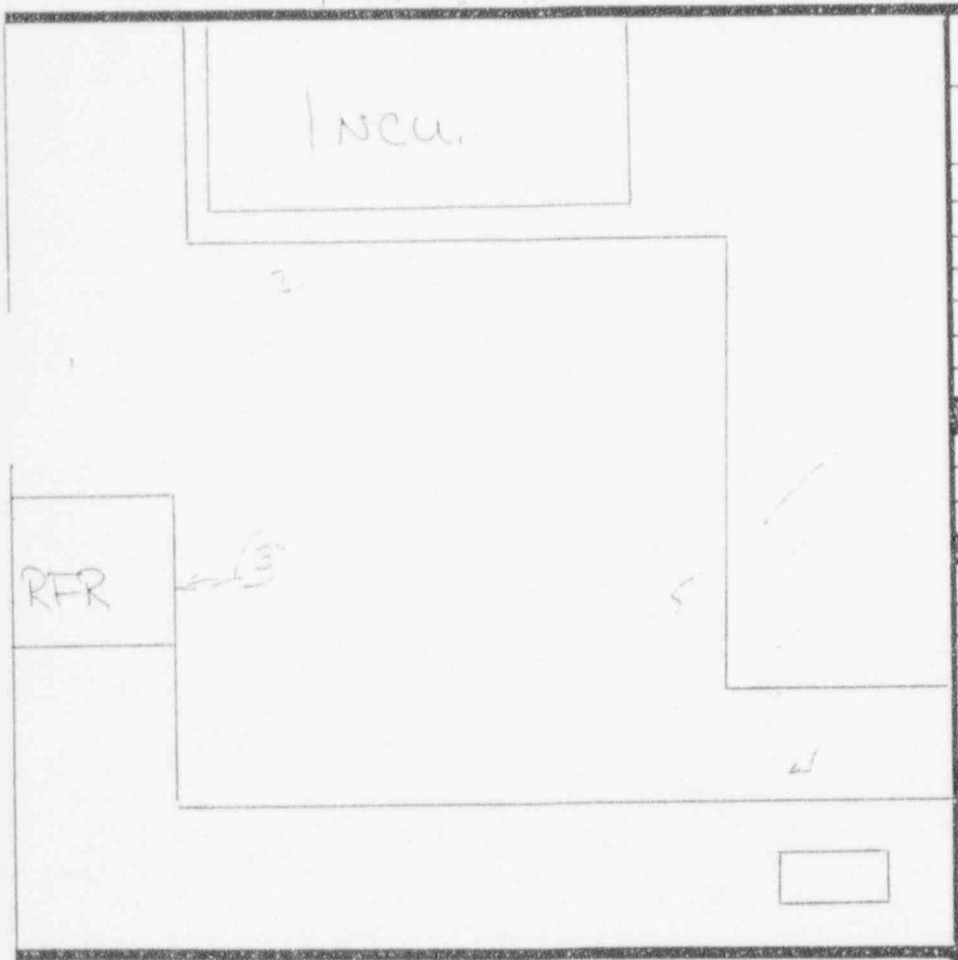
COMPANY NAME FDA

RADIATION SAFETY SURVEY

BLDG CVM

ROOM NO. 105

AUTHORIZED INVESTIGATOR	NAME (last, first initial) Myers, M.	PHONE NO.	DATE (month, day, year) [illegible]
SURVEYOR	NAME (last, first initial) [illegible]	PHONE NO.	SURVEY METER USED [illegible]



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
✓		(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 coats
✓		(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
✓		(21) Corridor storage meets requirements
✓		(22) Radiation levels <2.5 mR/hr
		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

METER 1	METER 2	METER 3

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100cm²)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 3H	<100	——	——	——	→					
NUCLIDE 2 125 I	<100	——	——		→					
NUCLIDE 3										

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

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ECOLOGY SERVICES, INC.

COMPANY NAME FDA

RADIATION SAFETY SURVEY

BLDG. BRF

ROOM NO. 6

AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE NO.	DATE (month, day, year) 10-19-92
SURVEYOR	NAME (last, first initial) Watts, C	PHONE NO.	SURVEY METER USED L3 w/ 44-9

COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
/		(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 coats
/	/	(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
/		(21) Corridor storage meets requirements
/	/	(22) Radiation levels <2.5 mR/hr
/		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

METER 1	METER 2	METER 3

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 P	<100	———								→
NUCLIDE 2										
NUCLIDE 3										

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

Rev. Oct 1990

ECOLOGY SERVICES, INC.

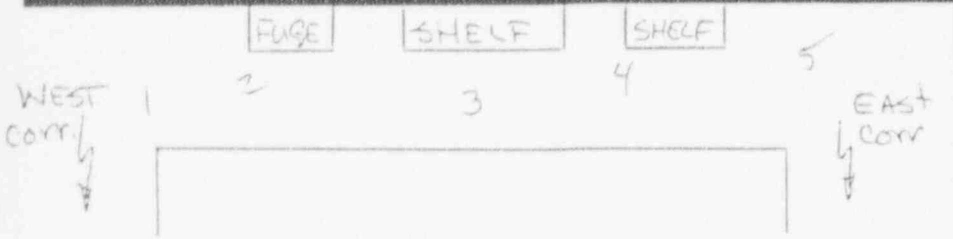
COMPANY NAME FDA

RADIATION SAFETY SURVEY

BLDG. BRF

ROOM NO. North Corr.

AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE NO.	DATE (month, day, year) 10-19-92
SURVEYOR	NAME (last, first initial) WATTS C	PHONE NO.	SURVEY METER USED L3 w/ 44-9



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
✓		(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 coats
✓	✓	(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
✓		(21) Corridor storage meets requirements
✓	✓	(22) Radiation levels <2.5 mR/hr
✓		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

METER 1	METER 2	METER 3

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 ^{32}P	<100	→								
NUCLIDE 2										
NUCLIDE 3										

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

Rev. Oct 1990

ECOLOGY SERVICES, INC.

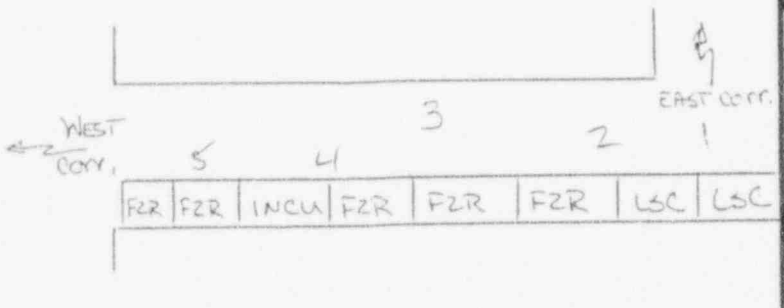
COMPANY NAME FDA

RADIATION SAFETY SURVEY

BLDG BRF

ROOM NO South Corr.

AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE NO.	DATE (month, day, year) 10-19-92
SURVEYOR	NAME (last, first initial) Watts C	PHONE NO.	SURVEY METER USED L3 w/ 44-9



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
✓		(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 coats
✓		(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
✓		(21) Corridor storage meets requirements
✓		(22) Radiation levels < 2.5 mR/hr
		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 P	<100	→	→	→	→					
NUCLIDE 2										
NUCLIDE 3										

METER 1	METER 2	METER 3

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

Rev. Oct 1990

ECOLOGY SERVICES, INC.
300 Second St., Laurel, Maryland 207.
(301) 498-1514

Company Name: FDA

RADIATION SAFETY SURVEY

Building / Room: BRF / LAB 18

Authorized Investigator: NAME:

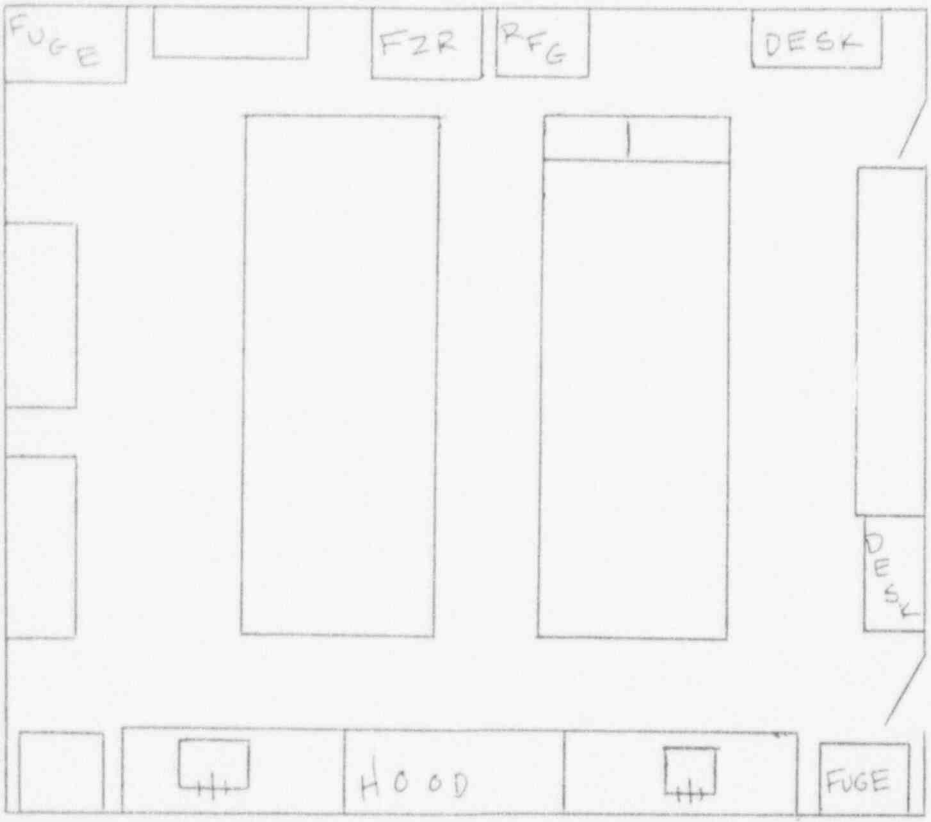
Phone No.

Date: 10-19-92

Surveyor: NAME: WATTS, C

Phone No.

Survey Meter Used L3w/44-9



Compliance Items: Y - Compliance
Y N 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
- ☐ ☐ Adequate use of Shielding
- ☐ ☐ Prohibition of eating, drinking, etc.
- ☐ ☐ Inventory & Disposal Records
- ☐ ☐ Survey Records Current
- ☐ ☐ Personnel Trained
- ☐ ☐ Prohibition on Mouth Pipetting
- ☐ ☐ Radiation Levels
- ☐ ☐ Contamination (Wipes) < 100 DPM/100 sq. cm.

Survey Instrument:

- ☐ ☐ Calibration Current
- ☐ ☐ Operational
- ☐ ☐ Available
- ☐ ☐ Other (Specify in Comments)

Wipe Sample Results:

LOCATION:	1	2	3	4	5	6	7	8	9	10
Nuclide 1 14C										
Nuclide 2										
Nuclide 3										
Nuclide 4										

Note: All wipe sample results are in units of DPM / 100 sq. cm.

Comments:

No RAM Use

ESI Form HPS 1 Rev 1.0 1/92

ECOLOGY SERVICES, INC.

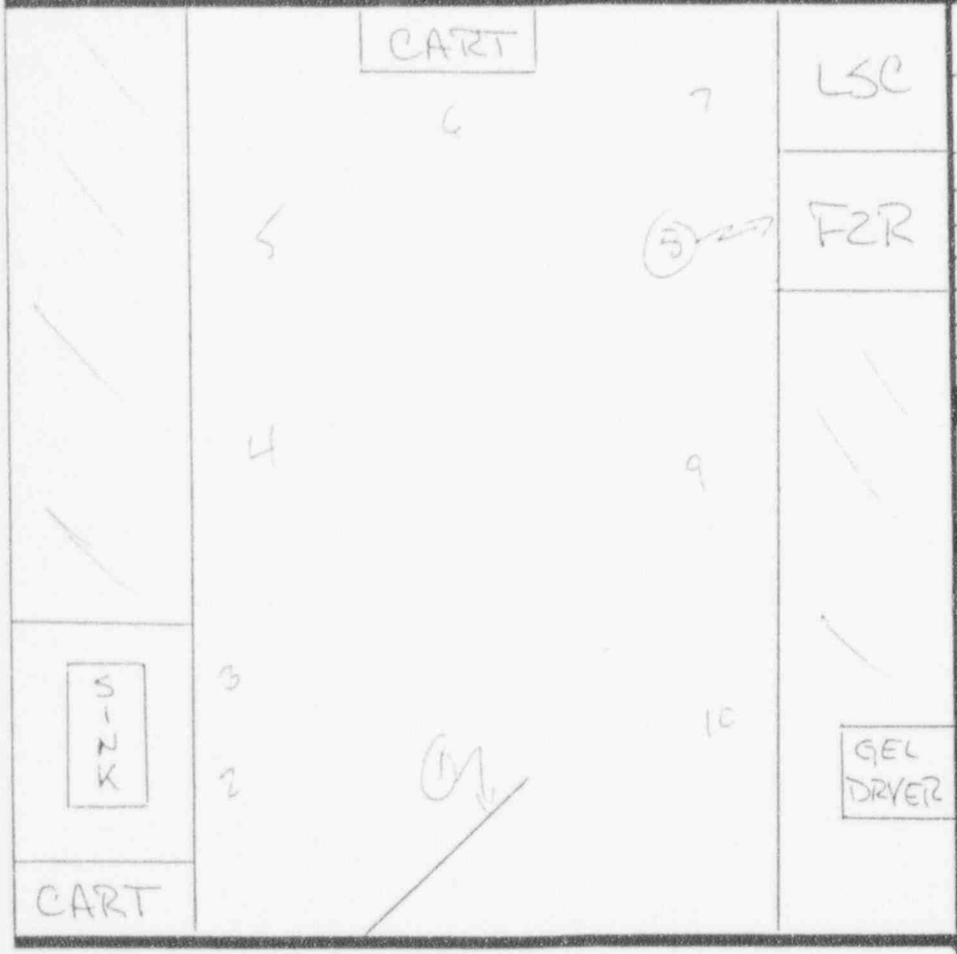
COMPANY NAME FDA

RADIATION SAFETY SURVEY

BLDG FB8

ROOM NO. 3756

AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE NO.	DATE (month, day, year) 10-20-92
SURVEYOR	NAME (last, first initial) WATTS, C	PHONE NO.	SURVEY METER USED L3 w/ 44-9



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
✓		(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 coats
✓	✓	(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
✓		(21) Corridor storage meets requirements
✓		(22) Radiation levels <2.5 mR/hr
✓		(23) Contamination (smears) < 100 dpm
✓		(24) Calibration current
✓		(25) Survey meters operational
✓		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

METER 1	METER 2	METER 3

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 P	<100	→								
NUCLIDE 2										
NUCLIDE 3										

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

METER SN 8000 OUT OF CAL

Rev. Oct 1990

ECOLOGY SERVICES, INC.

COMPANY NAME FDA

RADIATION SAFETY SURVEY

BLDG FB8

ROOM NO. 6446

AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE NO.	DATE (month, day, year) 10-20-92
SURVEYOR	NAME (last, first initial) Watts, C.	PHONE NO.	SURVEY METER USED L3W 44-9

COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
✓		(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 coats
✓		(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
✓		(21) Corridor storage meets requirements
✓		(22) Radiation levels < 2.5 mR/hr
✓		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 P	<100	→	→	→	→	→	→	→	→	→
NUCLIDE 2										
NUCLIDE 3										

METER 1	METER 2	METER 3

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

Rev. Oct 1990

ECOLOGY SERVICES, INC.

COMPANY NAME FDA

RADIATION SAFETY SURVEY

BLDG FB8

ROOM NO. 2266

AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE NO.	DATE (month, day, year) 10-20-92
SURVEYOR	NAME (last, first initial) Watts C	PHONE NO.	SURVEY METER USED N/A

COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
✓		(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 coats
✓		(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
		(21) Corridor storage meets requirements
✓		(22) Radiation levels <2.5 mR/hr
✓		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

METER 1	METER 2	METER 3

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 3H	<100	→	→	→	→	→	→	→	→	→
NUCLIDE 2										
NUCLIDE 3										

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

Rev. Oct 1990

ECOLOGY SERVICES, INC.

COMPANY NAME FDA

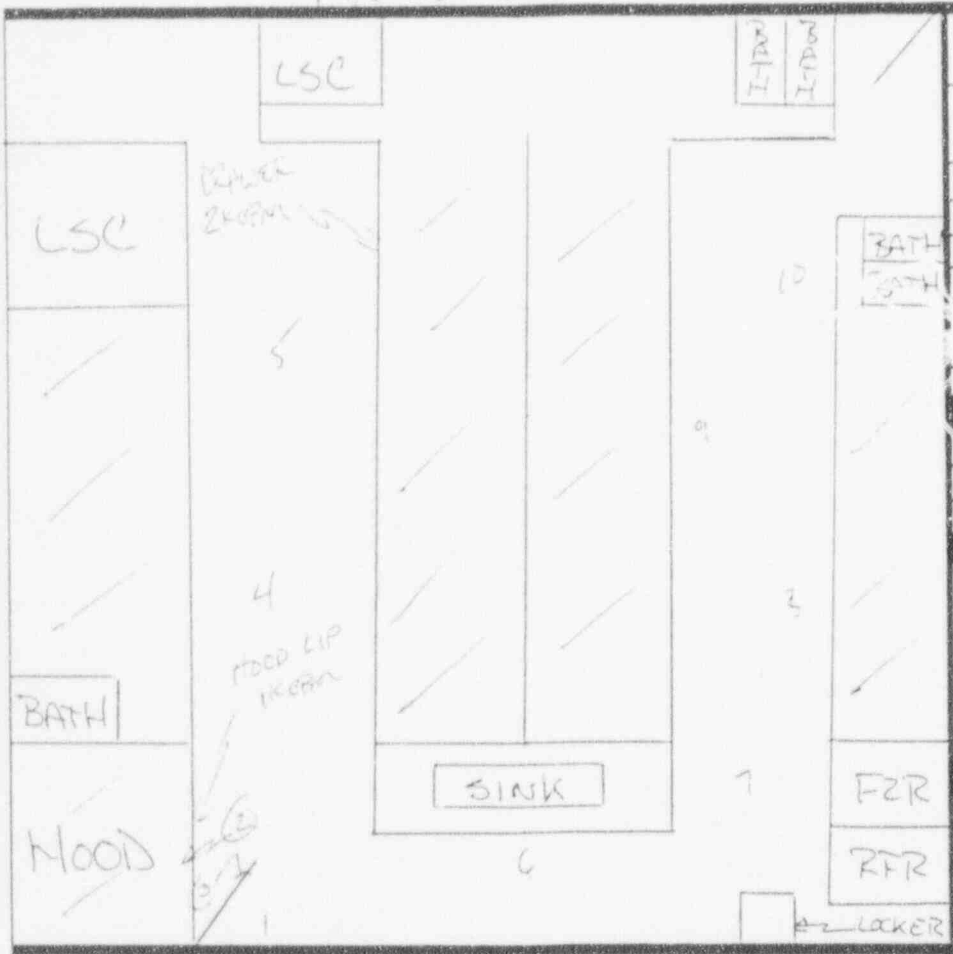
RADIATION SAFETY SURVEY

BLDG FB8

ROOM NO. 3838

AUTHORIZED INVESTIGATOR — NAME (last, first initial) — PHONE NO. — DATE (month, day, year) 10-20-92

SURVEYOR — NAME (last, first initial) Watts C — PHONE NO. — SURVEY METER USED L3 w/ 44-9



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y N

(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 coats
(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
(21) Corridor storage meets requirements
(22) Radiation levels < 2.5 mR/hr
(23) Contamination (smears) < 100 dpm
(24) Calibration current
(25) Survey meters operational
(26) Survey meters available
(27) Other (SPECIFY IN REMARKS)

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 φ	<100	→								
NUCLIDE 2										
NUCLIDE 3										

METER 1	METER 2	METER 3

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

DRAWER CONTAMINATED ; 7500 dpm/20cm^2

HOOD LIP CONTAMINATED ; 3654 dpm/20cm^2

METER SN 86568 OUT OF CAL

Rev. Oct 1990

ECOLOGY SERVICES, INC.

COMPANY NAME FDA

RADIATION SAFETY SURVEY

BLDG FB8

ROOM NO. 6846

AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE NO.	DATE (month, day, year) 10-20-92
SURVEYOR	NAME (last, first initial) Watts C	PHONE NO.	SURVEY METER USED L3 w/ 44-9

COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
✓		(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 coats
		(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
✓		(21) Corridor storage meets requirements
✓		(22) Radiation levels <2.5 mR/hr
✓		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm²)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 β	<100	→								→
NUCLIDE 2										
NUCLIDE 3										

METER 1	METER 2	METER 3

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

Rev. Oct 1990

ECOLOGY SERVICES, INC.

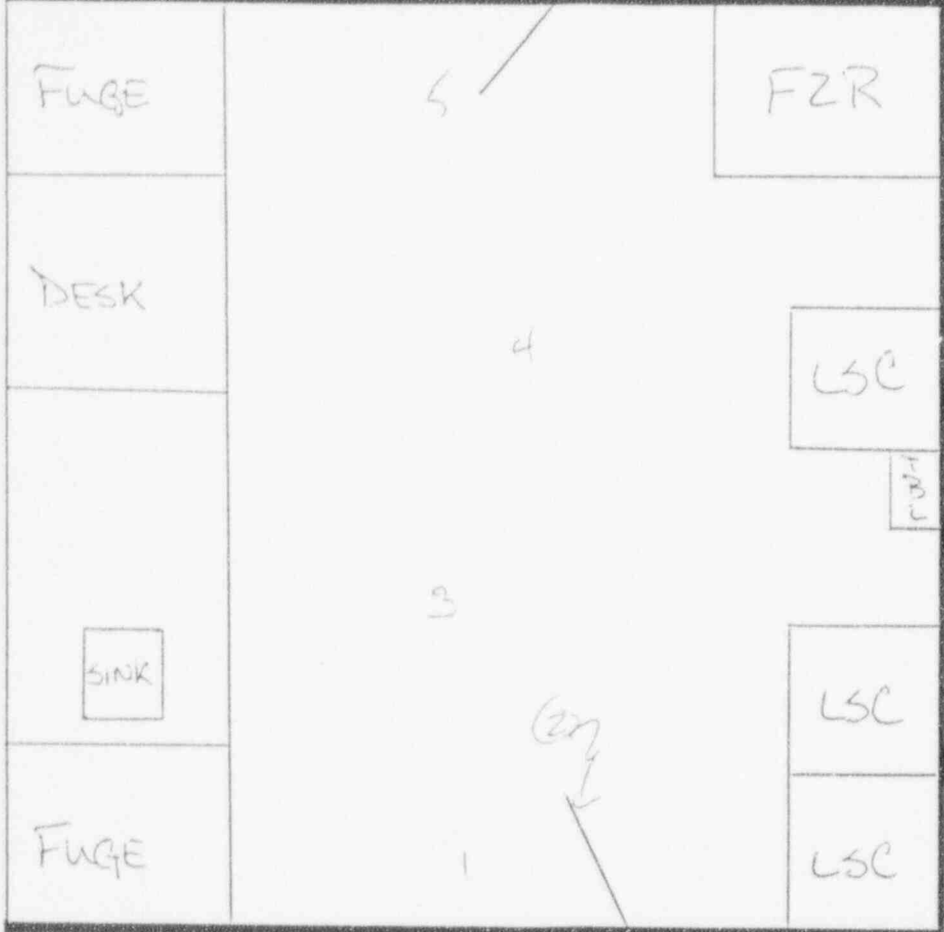
RADIATION SAFETY SURVEY

COMPANY NAME FDA

BLDG FB8

ROOM NO. 6448

AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE NO.	DATE (month, day, year) 10-20-92
SURVEYOR	NAME (last, first initial) WATTS C	PHONE NO.	SURVEY METER USED 13 w/ 44-9



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
✓		(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 coats
✓		(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
✓		(21) Corridor storage meets requirements
✓		(22) Radiation levels < 2.5 mR/hr
✓		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 P	<100	→	→	→	→					
NUCLIDE 2										
NUCLIDE 3										

METER 1	METER 2	METER 3

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

Rev. Oct 1990

ECOLOGY SERVICES, INC.
300 Second St., Laurel, Maryland 20707
(301) 498-1514

Company Name: FDA

RADIATION SAFETY SURVEY

Building / Room: MOD 1 / G402

Authorized Investigator: NAME:

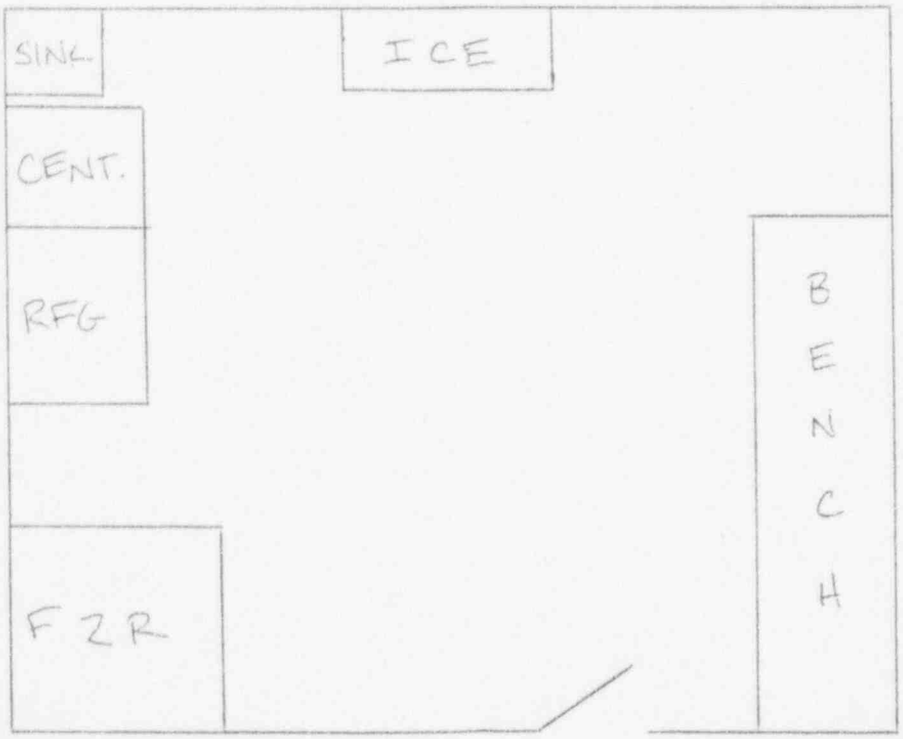
Phone No.

Date: 10-19-92

Surveyor: NAME: WATTS, C

Phone No.

Survey Meter Used



Wipe Sample Results:

LOCATION:	1	2	3	4	5	6	7	8	9	10
Nuclide 1										
Nuclide 2										
Nuclide 3										
Nuclide 4										

Note: All wipe sample results are in units of DPM / 100 sq. cm.

Comments:

NO RAM USE

Compliance Items: Y - Compliance

Y N 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
☐ ☐ Adequate use of Shielding
☐ ☐ Prohibition of eating, drinking, etc.
☐ ☐ Inventory & Disposal Records
☐ ☐ Survey Records Current
☐ ☐ Personnel Trained
☐ ☐ Prohibition on Mouth Pipetting
☐ ☐ Radiation Levels
☐ ☐ Contamination (Wipes) < 100 DPM/100 sq. cm.

Survey Instrument:

☐ ☐ Calibration Current
☐ ☐ Operational
☐ ☐ Available
☐ ☐ Other (Specify in Comments)

ESI Form HPS 1 Rev 1.0 1/92

ECOLOGY SERVICES, INC.
300 Second St., Laurel, Maryland 20707
(301) 498-1514

Company Name: FDA

RADIATION SAFETY SURVEY

Building / Room: MOD I / 3404

Authorized Investigator: NAME:

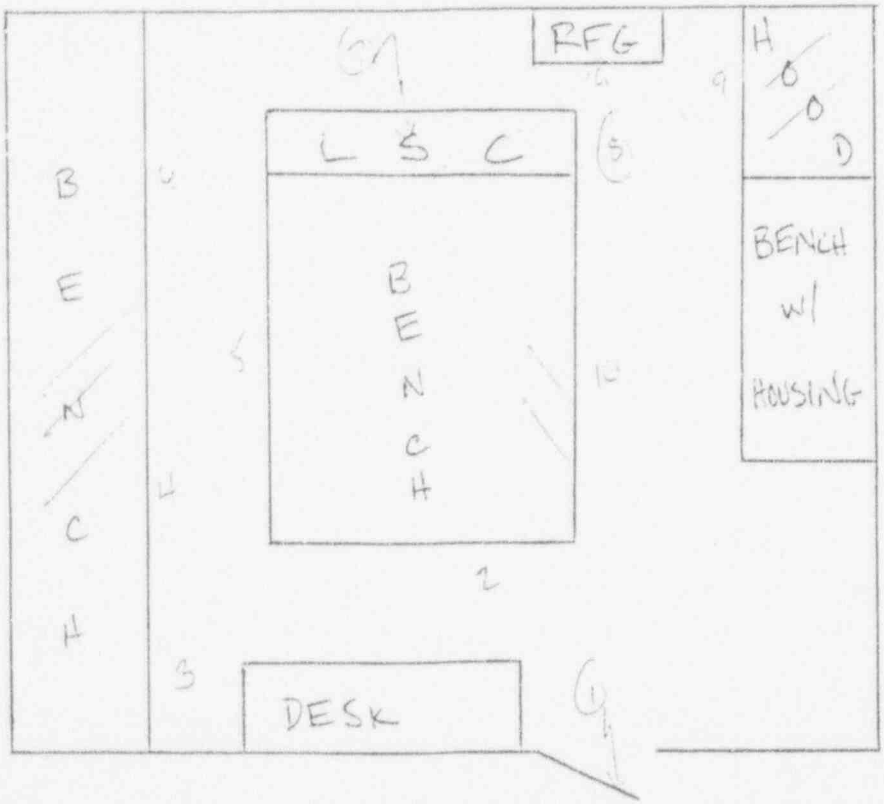
Phone No.

Date: 10-19-92

Surveyor: NAME: Wats C

Phone No.

Survey Meter Used L3 44-9



Compliance Items: Y - Compliance
Y N 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
- ☑ ☐ Adequate use of Shielding
- ☑ ☐ Prohibition of eating, drinking, etc.
- ☑ ☐ Inventory & Disposal Records
- ☑ ☐ Survey Records Current
- ☑ ☐ Personnel Trained
- ☑ ☐ Prohibition on Mouth Pipetting
- ☑ ☐ Radiation Levels
- ☑ ☐ Contamination (Wipes) < 100 DPM/100 sq. cm.

Survey Instrument:

- ☐ ☐ Calibration Current
- ☐ ☐ Operational
- ☐ ☐ Available
- ☐ ☐ Other (Specify in Comments)

Wipe Sample Results:

LOCATION:		1	2	3	4	5	6	7	8	9	10
Nuclide 1	P	<100	→								
Nuclide 2											
Nuclide 3											
Nuclide 4											

Note: All wipe sample results are in units of DPM / 100 sq. cm.

Comments:

ESI Form HPS.1 Rev 1.0 1/92

ECOLOGY SERVICES, INC.
300 Second St., Laurel, Maryland 20707
(301) 498-1514

Company Name: FDA

RADIATION SAFETY SURVEY

Building / Room: MOD 1 / 2305

Authorized Investigator: NAME:

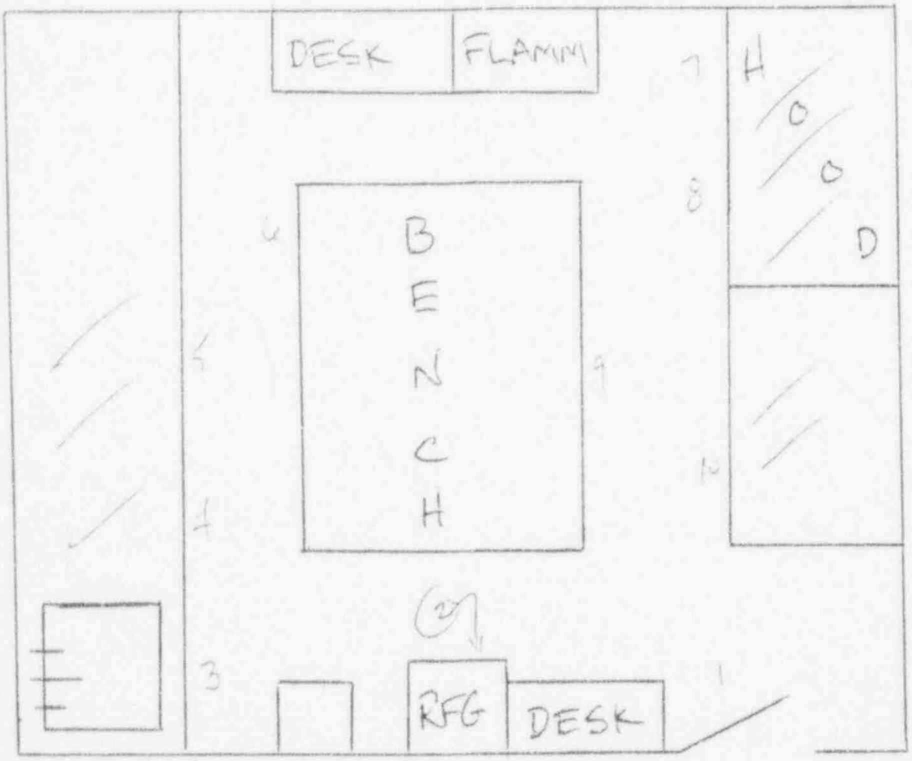
Phone No.

Date: 10-19-02

Surveyor: NAME: WATTS C

Phone No.

Survey Meter Used: L3WLL-9



Wipe Sample Results:

LOCATION:	1	2	3	4	5	6	7	8	9	10
Nuclide 1 P	<100									→
Nuclide 2										
Nuclide 3										
Nuclide 4										

Note: All wipe sample results are in units of DPM / 100 sq. cm.

Comments:

Compliance Items: Y - Compliance

Y N
☐ ☐

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
☐ ☐ Adequate use of Shielding
☐ ☐ Prohibition of eating, drinking, etc.
☑ ☐ Inventory & Disposal Records
☐ ☐ Survey Records Current
☑ ☐ Personnel Trained
☐ ☐ Prohibition on Mouth Pipetting
☐ ☐ Radiation Levels
☐ ☐ Contamination (Wipes) < 100 DPM/100 sq. cm.

Survey Instrument:

☐ ☐ Calibration Current
☐ ☐ Operational
☐ ☐ Available
☐ ☐ Other (Specify in Comments)

ESI Form HPS.1 Rev 1.0 1/92

ECOLOGY SERVICES, INC.
300 Second St., Laurel, Maryland 20707
(301) 498-1514

Company Name: FDA

RADIATION SAFETY SURVEY

Building / Room: MOD 1 / 2418

Authorized Investigator: NAME:

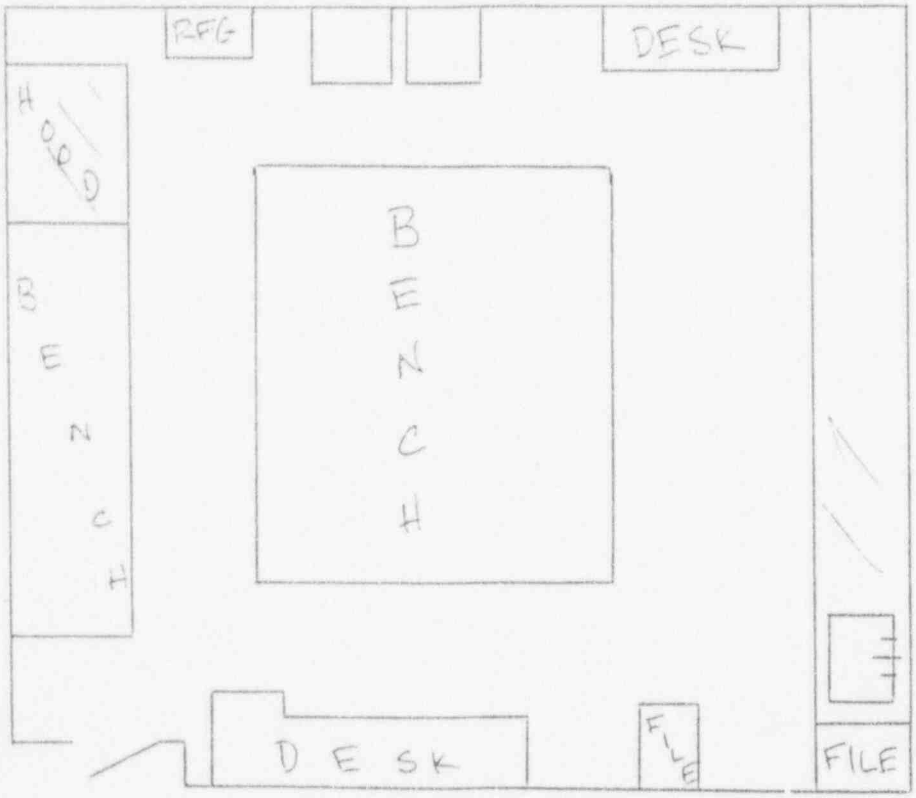
Phone No.

Date: 10-19-92

Surveyor: NAME: Watts, C

Phone No.

Survey Meter Used



Compliance Items: Y - Compliance

N - Non-Compliance

Blank - Not Evaluated

Y N
☐ ☐

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, etc.
☐ ☐ Inventory & Disposal Records
☐ ☐ Survey Records Current
☐ ☐ Personnel Trained
☐ ☐ Prohibition on Mouth Pipetting
☐ ☐ Radiation Levels
☐ ☐ Contamination (Wipes) < 100 DPM/100 sq. cm.

Survey Instrument:
☐ ☐ Calibration Current
☐ ☐ Operational
☐ ☐ Available
☐ ☐ Other (Specify in Comments)

Wipe Sample Results:

LOCATION:	1	2	3	4	5	6	7	8	9	10
Nuclide 1 P										
Nuclide 2										
Nuclide 3										
Nuclide 4										

Note: All wipe sample results are in units of DPM / 100 sq. cm.

Comments:

No RAM Use

ESI Form HPS.1 Rev 1.0 1/92

ECOLOGY SERVICES, INC.
300 Second St., Laurel, Maryland 20707
(301) 498-1514

Company Name: FDA

RADIATION SAFETY SURVEY

Building / Room: MOD 1 / 2313

Authorized Investigator: NAME:

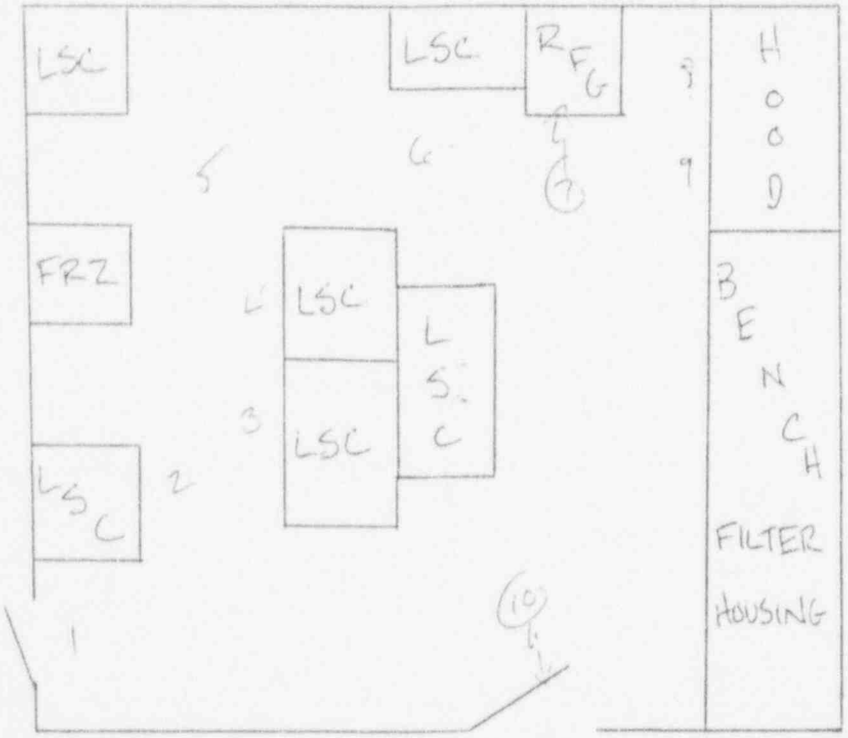
Phone No.

Date: 10-19-92

Surveyor: NAME: WATTS, C

Phone No.

Survey Meter Used: 13c/441-9



Compliance Items: Y - Compliance
N - Non-Compliance
Blank - Not Evaluated

Y	N	
☐	☐	

Compliance Items:

Y	N	
☑	☐	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, etc.
☑	☐	Inventory & Disposal Records
☑	☐	Survey Records Current
☑	☐	Personnel Trained
☑	☐	Prohibition on Mouth Pipetting
☑	☐	Radiation Levels
☑	☐	Contamination (Wipes) < 100 DPM/100 sq. cm.

Survey Instrument:

Y	N	
☐	☐	Calibration Current
☐	☐	Operational
☐	☐	Available
☐	☐	Other (Specify in Comments)

Wipe Sample Results:

LOCATION:	1	2	3	4	5	6	7	8	9	10
Nuclide 1 P	<100	—	—	—	—	—	—	—	—	→
Nuclide 2										
Nuclide 3										
Nuclide 4										

Note: All wipe sample results are in units of DPM / 100 sq. cm.

Comments:

ESI Form HPS.1 Rev 1.0 1/92

ECOLOGY SERVICES, INC.
300 Second St., Laurel, Maryland 20707
(301) 498-1514

Company Name: FDA

RADIATION SAFETY SURVEY

Building / Room: MOD 1 / 2315

Authorized Investigator: NAME:

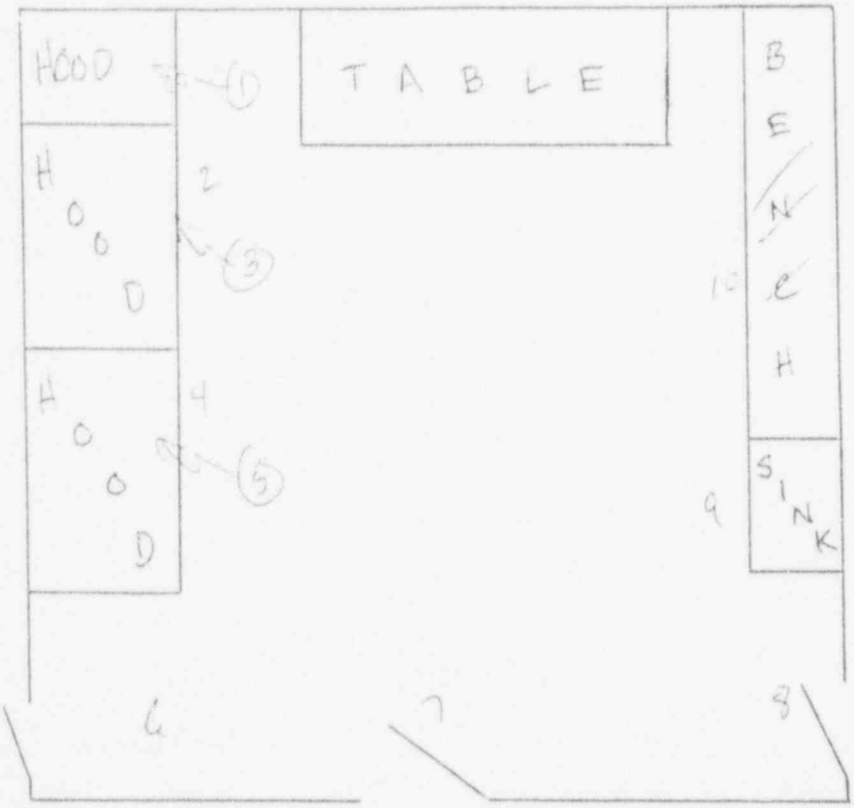
Phone No.

Date: 10-19-92

Surveyor: NAME: Watts C

Phone No.

Survey Meter Used: 13wdd-9



Wipe Sample Results:

LOCATION:	1	2	3	4	5	6	7	8	9	10
Nuclide 1 P	<100									→
Nuclide 2										
Nuclide 3										
Nuclide 4										

Note: All wipe sample results are in units of DPM / 100 sq. cm.

Comments:

Compliance Items: Y - Compliance
Y N 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
- ☐ ☐ Adequate use of Shielding
- ☐ ☐ Prohibition of eating, drinking, etc.
- ☐ ☐ Inventory & Disposal Records
- ☑ ☐ Survey Records Current
- ☐ ☐ Personnel Trained
- ☑ ☐ Prohibition on Mouth Pipetting
- ☐ ☐ Radiation Levels
- ☐ ☐ Contamination (Wipes) < 100 DPM/100 sq. cm.

Survey Instrument:

- ☐ ☐ Calibration Current
- ☐ ☐ Operational
- ☐ ☐ Available
- ☐ ☐ Other (Specify in Comments)

ESI Form HPS.1 Rev 1.0 1/92

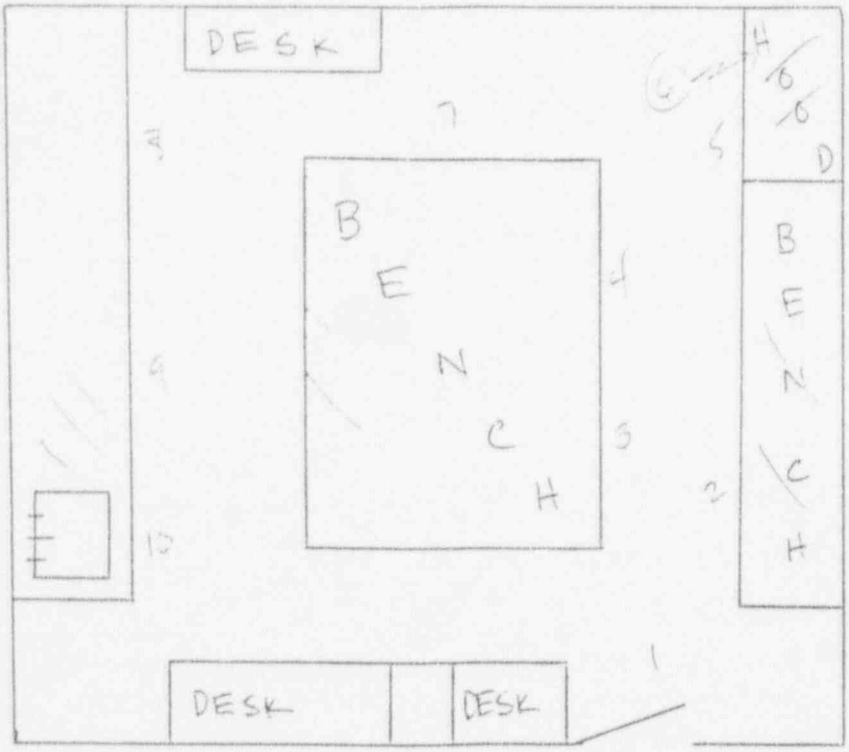
ECOLOGY SERVICES, INC.
300 Second St., Laurel, Maryland 20707
(301) 498-1514

Company Name: FDA

RADIATION SAFETY SURVEY

Building / Room: MOD 1 / 2321

Authorized Investigator:	NAME:	Phone No.	Date. 10-19-92
Surveyor:	NAME: WATTS, C	Phone No.	Survey Meter Used L3 w/44-9



Compliance Items: Y - Compliance
Y N 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
- ☐ ☐ Adequate use of Shielding
- ☑ ☐ Prohibition of eating, drinking, etc.
- ☑ ☐ Inventory & Disposal Records
- ☑ ☐ Survey Records Current
- ☑ ☐ Personnel Trained
- ☑ ☐ Prohibition on Mouth Pipetting
- ☑ ☐ Radiation Levels
- ☑ ☐ Contamination (Wipes) < 100 DPM/100 sq. cm.

Survey Instrument:

- ☐ ☐ Calibration Current
- ☐ ☐ Operational
- ☐ ☐ Available
- ☐ ☐ Other (Specify in Comments)

Wipe Sample Results:

LOCATION:	1	2	3	4	5	6	7	8	9	10
Nuclide 1 P	<100	—	—	—	—	—	—	—	—	→
Nuclide 2										
Nuclide 3										
Nuclide 4										

Note: All wipe sample results are in units of DPM / 100 sq. cm.

Comments:

ESI Form HPS.1 Rev 1.0 1/92

ECOLOGY SERVICES, INC.
300 Second St., Laurel, Maryland 20707
(301) 498-1514

Company Name: FDA

RADIATION SAFETY SURVEY

Building / Room: MOD 1 / WASTE

Authorized Investigator: NAME:

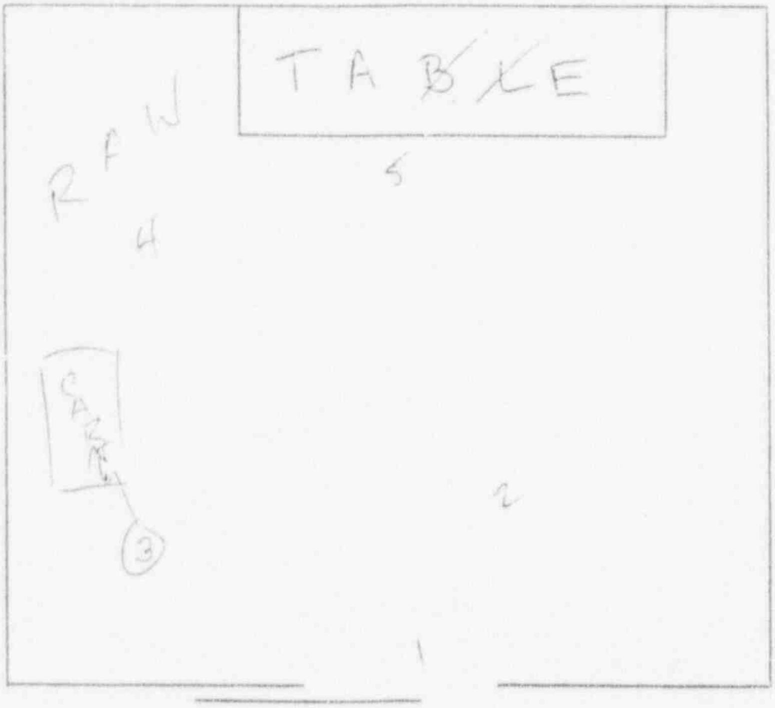
Phone No.

Date: 10-19-92

Surveyor: NAME: WATTS C

Phone No.

Survey Meter Used: L3w 44-9



Wipe Sample Results:

LOCATION:	1	2	3	4	5	6	7	8	9	10
Nuclide 1 P	<100	→	→	→	→					
Nuclide 2										
Nuclide 3										
Nuclide 4										

Note: All wipe sample results are in units of DPM / 100 sq. cm.

Comments:

Compliance Items: Y - Compliance
N - Non-Compliance
Blank - Not Evaluated

Y N
☐ ☐

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, etc.
- ☑ ☐ Inventory & Disposal Records
- ☑ ☐ Survey Records Current
- ☑ ☐ Personnel Trained
- ☑ ☐ Prohibition on Mouth Pipetting
- ☑ ☐ Radiation Levels
- ☑ ☐ Contamination (Wipes) < 100 DPM/100 sq. cm.

Survey Instrument:

- ☐ ☐ Calibration Current
- ☐ ☐ Operational
- ☐ ☐ Available
- ☐ ☐ Other (Specify in Comments)

ESI Form HPS.1 Rev 1.0 1/92

ECOLOGY SERVICES, INC.
300 Second St., Laurel, Maryland 20707
(301) 498-1514

Company Name: FDA

RADIATION SAFETY SURVEY

Building / Room: MOD 1 / 1107

Authorized Investigator:	NAME:	Phone No.	Date: 10-19-92
Surveyor:	NAME: WATTS, C	Phone No.	Survey Meter Used

Compliance Items: Y - Compliance
N - Non-Compliance
Blank - Not Evaluated

Y N

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, etc.
- ☐ ☐ Inventory & Disposal Records
- ☐ ☐ Survey Records Current
- ☐ ☐ Personnel Trained
- ☐ ☐ Prohibition on Mouth Pipetting
- ☐ ☐ Radiation Levels
- ☐ ☐ Contamination (Wipes) < 100 DPM/100 sq. cm.

Survey Instrument:

- ☐ ☐ Calibration Current
- ☐ ☐ Operational
- ☐ ☐ Available
- ☐ ☐ Other (Specify in Comments)

Wipe Sample Results:

LOCATION:	1	2	3	4	5	6	7	8	9	10
Nuclide 1										
Nuclide 2										
Nuclide 3										
Nuclide 4										

Note: All wipe sample results are in units of DPM / 100 sq. cm.

Comments:

NO RAM USE

ESI Form HPS.1 Rev 1.0 1/92

ECOLOGY SERVICES, INC.
300 Second St., Laurel, Maryland 20707
(301) 498-1514

Company Name: FDA

RADIATION SAFETY SURVEY

Building / Room: MOD 1 / G414

Authorized Investigator: NAME:

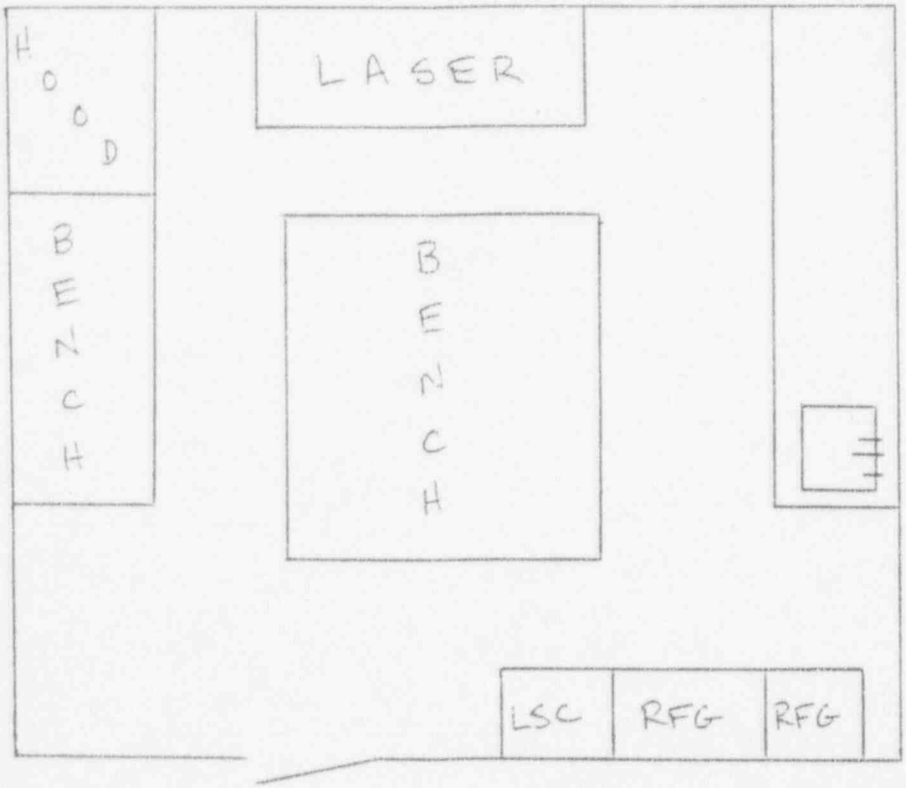
Phone No.

Date: 10-19-92

Surveyor: NAME: WATTS C

Phone No.

Survey Meter Used



Compliance Items: Y - Compliance

Y N ☐ ☐

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
- ☐ ☐ Adequate use of Shielding
- ☐ ☐ Prohibition of eating, drinking, etc.
- ☐ ☐ Inventory & Disposal Records
- ☐ ☐ Survey Records Current
- ☐ ☐ Personnel Trained
- ☐ ☐ Prohibition on Mouth Pipetting
- ☐ ☐ Radiation Levels
- ☐ ☐ Contamination (Wipes) < 100 DPM/100 sq. cm.

Survey Instrument:

- ☐ ☐ Calibration Current
- ☐ ☐ Operational
- ☐ ☐ Available
- ☐ ☐ Other (Specify in Comments)

Wipe Sample Results:

LOCATION:	1	2	3	4	5	6	7	8	9	10
Nuclide 1										
Nuclide 2										
Nuclide 3										
Nuclide 4										

Note: All wipe sample results are in units of DPM / 100 sq. cm.

Comments:

No RAM USE

ESI Form HPS.1 Rev 1.0 1/92

ECOLOGY SERVICES, INC.
300 Second St., Laurel, Maryland 20707
(301) 498-1514

Company Name: FDA

RADIATION SAFETY SURVEY

Building / Room: MOD 1 / 2321

Authorized Investigator: NAME: Branaugh, R

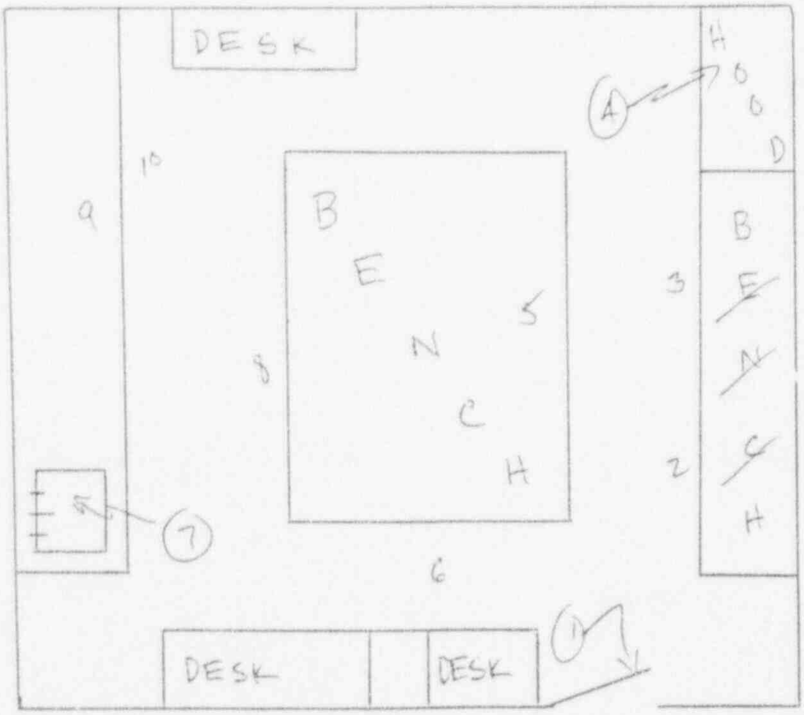
Phone No.

Date: 9-14-92

Surveyor: NAME: Watts, C

Phone No.

Survey Meter Used: L3 w/ 44-9



Wipe Sample Results:

LOCATION:	1	2	3	4	5	6	7	8	9	10
Nuclide 1 14C	<100	⟶								
Nuclide 2										
Nuclide 3										
Nuclide 4										

Note: All wipe sample results are in units of DPM / 100 sq. cm.

Comments:

Compliance Items: Y - Compliance
N - Non-Compliance
Blank - Not Evaluated
Y N
☐ ☐

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, etc.
- ☑ ☐ Inventory & Disposal Records
- ☑ ☐ Survey Records Current
- ☑ ☐ Personnel Trained
- ☑ ☐ Prohibition on Mouth Pipetting
- ☑ ☐ Radiation Levels
- ☑ ☐ Contamination (Wipes) < 100 DPM/100 sq. cm.

Survey Instrument:

- ☑ ☐ Calibration Current
- ☑ ☐ Operational
- ☑ ☐ Available
- ☐ ☐ Other (Specify in Comments)

ESI Form HPS.1 Rev 1.0 1/92

ECOLOGY SERVICES, INC.
300 Second St., Laurel, Maryland 20707
(301) 498-1514

Company Name: FDA

RADIATION SAFETY SURVEY

Building / Room: MOD 1 / 2313

Authorized Investigator: NAME: BRONAUGH, R

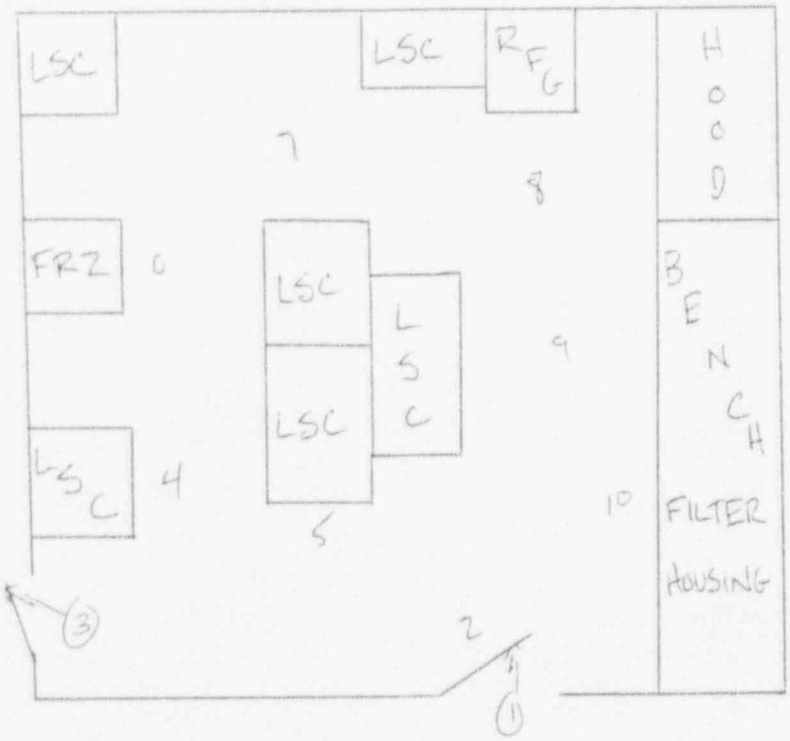
Phone No.:

Date: 9-14-92

Surveyor: NAME: WATTS, C

Phone No.:

Survey Meter Used: L3 w/44-9



Compliance Items: Y - Compliance

Y N

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
- ☑ ☐ Adequate use of Shielding
- ☑ ☐ Prohibition of eating, drinking, etc.
- ☑ ☐ Inventory & Disposal Records
- ☑ ☐ Survey Records Current
- ☑ ☐ Personnel Trained
- ☑ ☐ Prohibition on Mouth Pipetting
- ☑ ☐ Radiation Levels
- ☑ ☐ Contamination (Wipes) < 100 DPM/100 sq. cm.

Survey Instrument:

- ☐ ☐ Calibration Current
- ☐ ☐ Operational
- ☐ ☐ Available
- ☐ ☐ Other (Specify in Comments)

Wipe Sample Results:

LOCATION:	1	2	3	4	5	6	7	8	9	10
Nuclide 1 P	<100	→								
Nuclide 2										
Nuclide 3										
Nuclide 4										

Note: All wipe sample results are in units of DPM / 100 sq. cm.

Comments:

ESI Form HPS.1 Rev 1.0 1/92

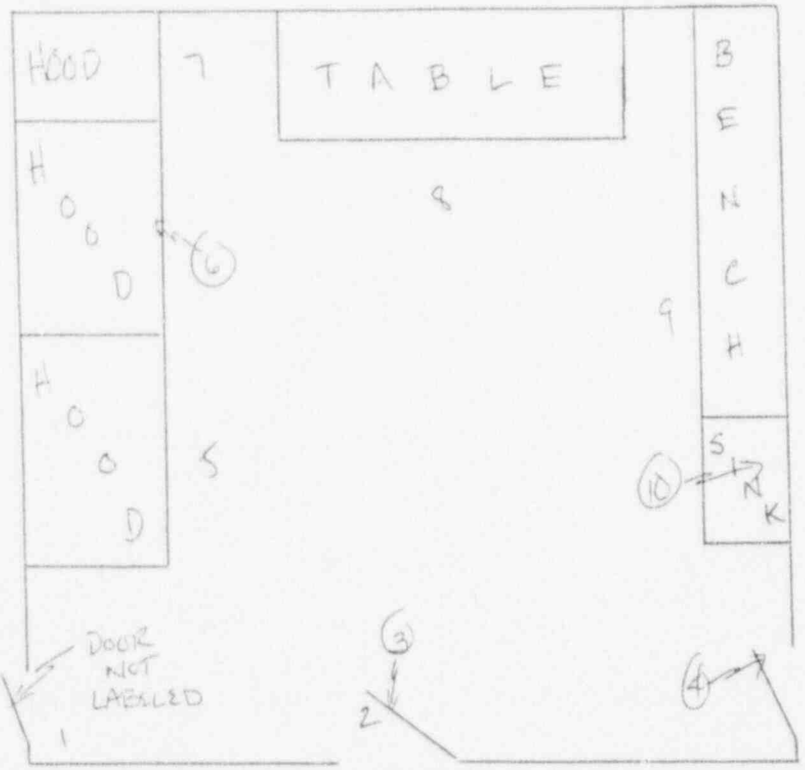
ECOLOGY SERVICES, INC.
300 Second St., Laurel, Maryland 20707
(301) 498-1514

Company Name: FDA

RADIATION SAFETY SURVEY

Building / Room: MOD 1 / 2315

Authorized Investigator:	NAME: BRONAUGH, R	Phone No.	Date: 9-14-92
Surveyor:	NAME: WATTS, C	Phone No.	Survey Meter Used L3 w/44-9



Wipe Sample Results:

LOCATION:	1	2	3	4	5	6	7	8	9	10
Nuclide 1 P	<100	→								
Nuclide 2										
Nuclide 3										
Nuclide 4										

Note: All wipe sample results are in units of DPM / 100 sq. cm.

Comments:

Compliance Items: Y - Compliance

Y N
☐ ☐

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
- ☑ ☐ Adequate use of Shielding
- ☑ ☐ Prohibition of eating, drinking, etc.
- ☑ ☐ Inventory & Disposal Records
- ☑ ☐ Survey Records Current
- ☑ ☐ Personnel Trained
- ☑ ☐ Prohibition on Mouth Pipetting
- ☑ ☐ Radiation Levels
- ☑ ☐ Contamination (Wipes) < 100 DPM/100 sq. cm.

Survey Instrument:

- ☐ ☐ Calibration Current
- ☐ ☐ Operational
- ☐ ☐ Available
- ☐ ☐ Other (Specify in Comments)

ESI Form HPS.1 Rev 1.0 1/92

ECOLOGY SERVICES, INC.
300 Second St., Laurel, Maryland 20707
(301) 498-1514

Company Name: FDA

RADIATION SAFETY SURVEY

Building / Room: MOD 1 / 1107

Authorized Investigator: NAME: CESAN (SAFETY OFFICE)

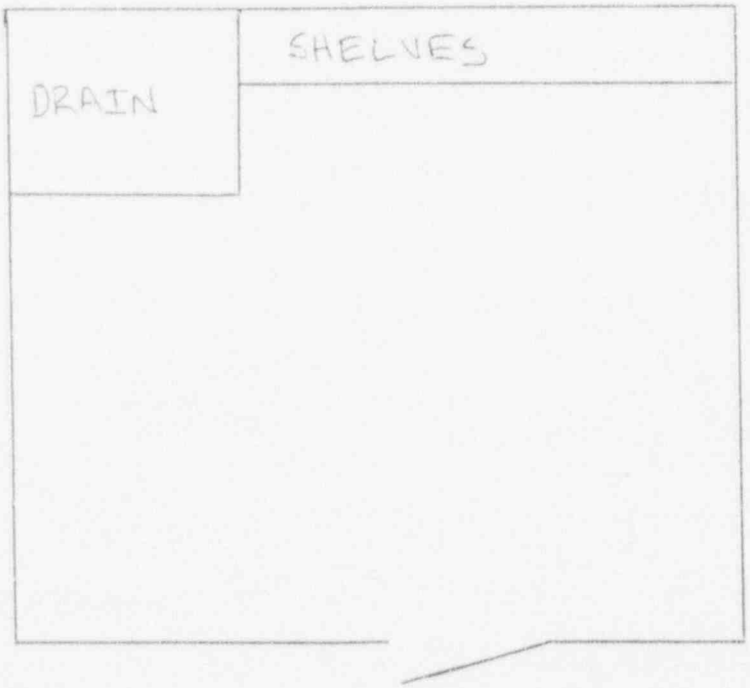
Phone No.

Date: 9-14-92

Surveyor: NAME: WATTS, C

Phone No.

Survey Meter Used: N/A



Compliance Items: Y - Compliance

Y N
☐ ☐

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
- ☐ ☐ Adequate use of Shielding
- ☐ ☐ Prohibition of eating, drinking, etc.
- ☐ ☐ Inventory & Disposal Records
- ☐ ☐ Survey Records Current
- ☐ ☐ Personnel Trained
- ☐ ☐ Prohibition on Mouth Pipetting
- ☐ ☐ Radiation Levels
- ☐ ☐ Contamination (Wipes) < 100 DPM/100 sq. cm.

Survey Instrument:

- ☐ ☐ Calibration Current
- ☐ ☐ Operational
- ☐ ☐ Available
- ☐ ☐ Other (Specify in Comments)

Wipe Sample Results:

LOCATION:	1	2	3	4	5	6	7	8	9	10
Nuclide 1										
Nuclide 2										
Nuclide 3										
Nuclide 4										

Note: All wipe sample results are in units of DPM / 100 sq. cm.

Comments:

No RAM Use

ESI Form HPS.1 Rev 1.0 1/92

ECOLOGY SERVICES, INC.
300 Second St., Laurel, Maryland 20707
(301) 498-1514

Company Name: FDA

RADIATION SAFETY SURVEY

Building / Room: MOD 1 / G414

Authorized Investigator: NAME: KAYBURNE

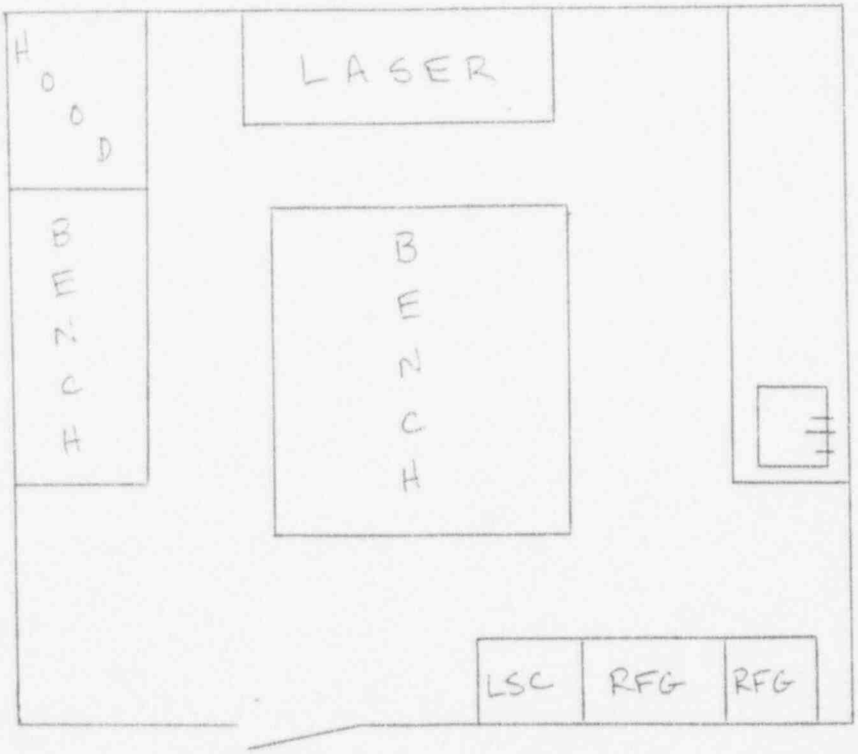
Phone No.

Date: 9-14-92

Surveyor: NAME: WATTS, C

Phone No.

Survey Meter Used: N/A



Wipe Sample Results:

LOCATION:	1	2	3	4	5	6	7	8	9	10
Nuclide 1										
Nuclide 2										
Nuclide 3										
Nuclide 4										

Note: All wipe sample results are in units of DPM / 100 sq. cm.

Comments:

No RAM USE

Compliance Items: Y - Compliance
Y N
☐ ☐ 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
☐ ☐ Adequate use of Shielding
☐ ☐ Prohibition of eating, drinking, etc.
☐ ☐ Inventory & Disposal Records
☐ ☐ Survey Records Current
☐ ☐ Personnel Trained
☐ ☐ Prohibition on Mouth Pipetting
☐ ☐ Radiation Levels
☐ ☐ Contamination (Wipes) < 100 DPM/100 sq. cm.

Survey Instrument:
☐ ☐ Calibration Current
☐ ☐ Operational
☐ ☐ Available
☐ ☐ Other (Specify in Comments)

ESI Form HPS.1 Rev 1.0 1/92

ECOLOGY SERVICES, INC.
300 Second St., Laurel, Maryland 20707
(301) 498-1514

Company Name: FDA

RADIATION SAFETY SURVEY

Building / Room: MOD 1 / G402

Authorized Investigator: NAME:

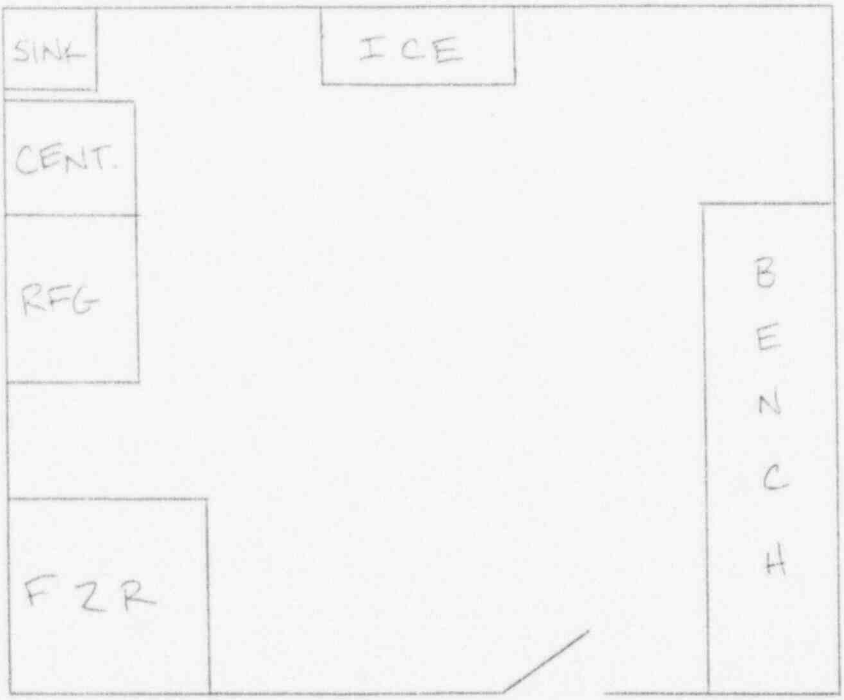
Phone No.

Date: 9-14-92

Surveyor: NAME: WATTS C

Phone No.

Survey Meter Used: N/A



Compliance Items: Y - Compliance

Y N ☐ ☐ 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
- ☐ ☐ Adequate use of Shielding
- ☐ ☐ Prohibition of eating, drinking, etc.
- ☐ ☐ Inventory & Disposal Records
- ☐ ☐ Survey Records Current
- ☐ ☐ Personnel Trained
- ☐ ☐ Prohibition on Mouth Pipetting
- ☐ ☐ Radiation Levels
- ☐ ☐ Contamination (Wipes) < 100 DPM/100 sq. cm.

Survey Instrument:

- ☐ ☐ Calibration Current
- ☐ ☐ Operational
- ☐ ☐ Available
- ☐ ☐ Other (Specify in Comments)

Wipe Sample Results:

LOCATION:	1	2	3	4	5	6	7	8	9	10
Nuclide 1										
Nuclide 2										
Nuclide 3										
Nuclide 4										

Note: All wipe sample results are in units of DPM / 100 sq. cm.

Comments:

No RAM Use

ESI Form HPS.1 Rev 1.0 1/92

ECOLOGY SERVICES, INC.
300 Second St., Laurel, Maryland 20707
(301) 498-1514

Company Name: FDA

RADIATION SAFETY SURVEY

Building / Room: MOD 1 / 2418

Authorized Investigator: NAME: BRONAUGH, R

Phone No.:

Date: 9-14-92

Surveyor: NAME: WATTS C

Phone No.:

Survey Meter Used: L3-44-9

Wipe Sample Results:

LOCATION:	1	2	3	4	5	6	7	8	9	10
Nuclide 1 P	<100									→
Nuclide 2										
Nuclide 3										
Nuclide 4										

Note: All wipe sample results are in units of DPM / 100 sq. cm.

Comments:

Compliance Items: Y - Compliance

Y N

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
- ☐ ☐ Adequate use of Shielding
- ☑ ☐ Prohibition of eating, drinking, etc.
- ☑ ☐ Inventory & Disposal Records
- ☑ ☐ Survey Records Current
- ☑ ☐ Personnel Trained
- ☑ ☐ Prohibition on Mouth Pipetting
- ☑ ☐ Radiation Levels
- ☑ ☐ Contamination (Wipes) < 100 DPM/100 sq. cm.

Survey Instrument:

- ☐ ☐ Calibration Current
- ☐ ☐ Operational
- ☐ ☐ Available
- ☐ ☐ Other (Specify in Comments)

ESI Form HPS.1 Rev 1.0 1/92

ECOLOGY SERVICES, INC.
300 Second St., Laurel, Maryland 20707
(301) 498-1514

Company Name: FDA

RADIATION SAFETY SURVEY

Building / Room: MOD 1 / 2305

Authorized Investigator: NAME: Branagh, R

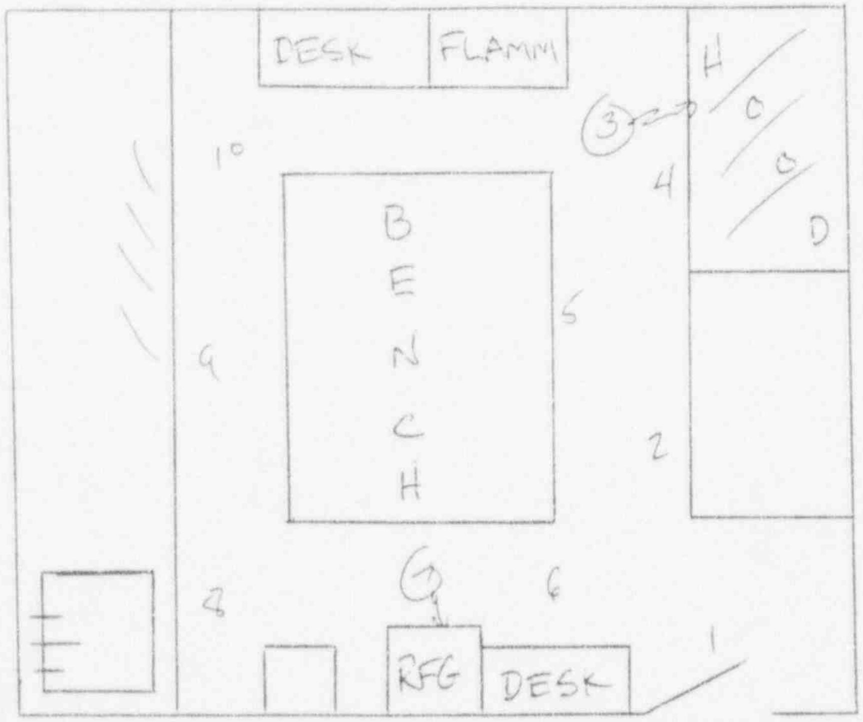
Phone No.

Date: 9-14-92

Surveyor: NAME: WATTS, C

Phone No.

Survey Meter Used: L3W44-9



Compliance Items: Y - Compliance
Y N
☐ ☐
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
☑ ☐ Adequate use of Shielding
☑ ☐ Prohibition of eating, drinking, etc.
☑ ☐ Inventory & Disposal Records
☑ ☐ Survey Records Current
☑ ☐ Personnel Trained
☑ ☐ Prohibition on Mouth Pipetting
☑ ☐ Radiation Levels
☑ ☐ Contamination (Wipes) < 100 DPM/100 sq. cm.

Survey Instrument:
☑ ☐ Calibration Current
☑ ☐ Operational
☑ ☐ Available
☐ ☐ Other (Specify in Comments)

Wipe Sample Results:

LOCATION:	1	2	3	4	5	6	7	8	9	10
Nuclide 1 ^{32}P	<100	→								
Nuclide 2										
Nuclide 3										
Nuclide 4										

Note: All wipe sample results are in units of DPM / 100 sq. cm.

Comments:

ESI Form HPS.1 Rev 1.0 1/92

ECOLOGY SERVICES, INC.
300 Second St., Laurel, Maryland 20707
(301) 498-1514

Company Name: FDA

RADIATION SAFETY SURVEY

Building / Room: MOD 1 / WASTE

Authorized Investigator: NAME: CFSAN (SAFETY OFFICE)

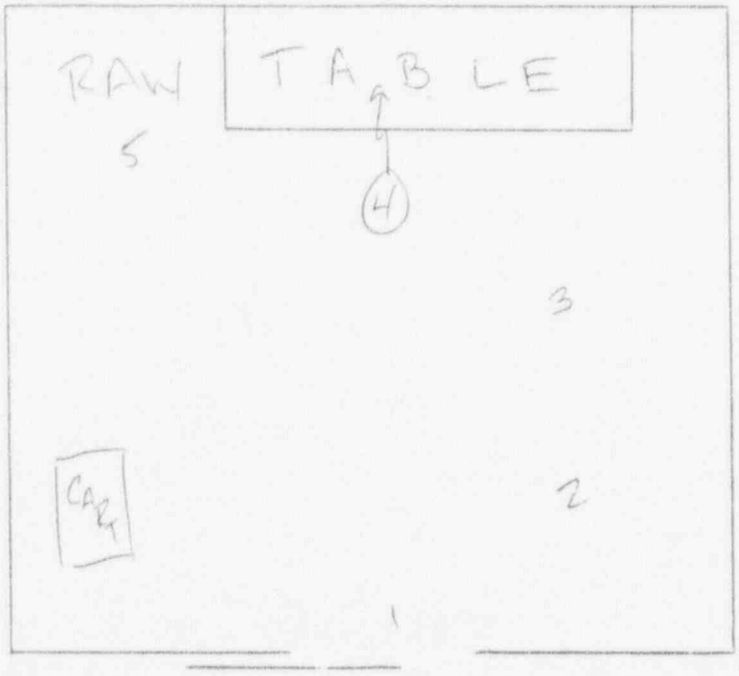
Phone No.

Date: 9-14-92

Surveyor: NAME: WATTS, C

Phone No.

Survey Meter Used: 13w/44-9



Compliance Items: Y - Compliance

Y N
☐ ☐

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
- ☑ ☐ Adequate use of Shielding
- ☑ ☐ Prohibition of eating, drinking, etc.
- ☑ ☐ Inventory & Disposal Records
- ☑ ☐ Survey Records Current
- ☑ ☐ Personnel Trained
- ☑ ☐ Prohibition on Mouth Pipetting
- ☑ ☐ Radiation Levels
- ☑ ☐ Contamination (Wipes) < 100 DPM/100 sq. cm.

Survey Instrument:

- ☐ ☐ Calibration Current
- ☐ ☐ Operational
- ☐ ☐ Available
- ☐ ☐ Other (Specify in Comments)

Wipe Sample Results:

LOCATION:	1	2	3	4	5	6	7	8	9	10
Nuclide 1 P	<10	→								
Nuclide 2										
Nuclide 3										
Nuclide 4										

Note: All wipe sample results are in units of DPM / 100 sq. cm.

Comments:

ESI Form HPS 1 Rev 1.0 1/92

ECOLOGY SERVICES, INC.
300 Second St., Laurel, Maryland 20707
(301) 498-1514

Company Name: FDA

RADIATION SAFETY SURVEY

Building / Room: MOD 1 / 3404

Authorized Investigator: NAME: SISTARE, F

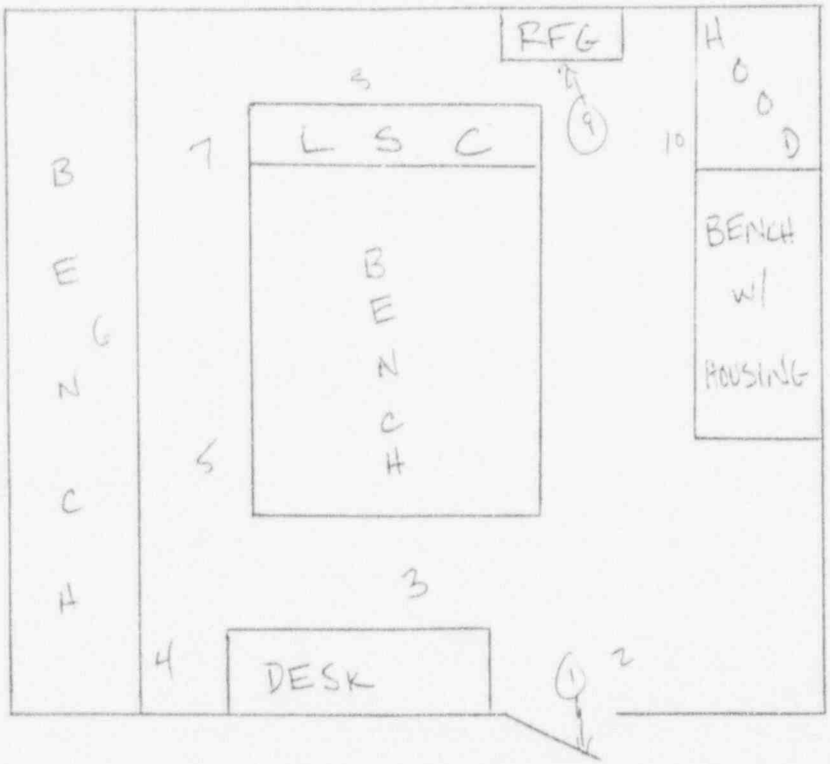
Phone No.

Date: 9-14-92

Surveyor: NAME: WATTS, C

Phone No.

Survey Meter Used: L3 w/ 44-9



Wipe Sample Results:

LOCATION:	1	2	3	4	5	6	7	8	9	10
Nuclide 1 P	<100									→
Nuclide 2										
Nuclide 3										
Nuclide 4										

Note: All wipe sample results are in units of DPM / 100 sq. cm.

Comments:

Compliance Items: Y - Compliance
Y N — 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
- ☑ ☐ Adequate use of Shielding
- ☑ ☐ Prohibition of eating, drinking, etc.
- ☑ ☐ Inventory & Disposal Records
- ☑ ☐ Survey Records Current
- ☑ ☐ Personnel Trained
- ☑ ☐ Prohibition on Mouth Pipetting
- ☑ ☐ Radiation Levels
- ☑ ☐ Contamination (Wipes) < 100 DPM/100 sq. cm.

Survey Instrument:

- ☐ ☐ Calibration Current
- ☐ ☐ Operational
- ☐ ☐ Available
- ☐ ☐ Other (Specify in Comments)

ECOLOGY SERVICES, INC.

COMPANY NAME FDA

RADIATION SAFETY SURVEY

BLDG CVM

ROOM NO. 103

AUTHORIZED INVESTIGATOR — NAME (last, first initial) Myers, M.

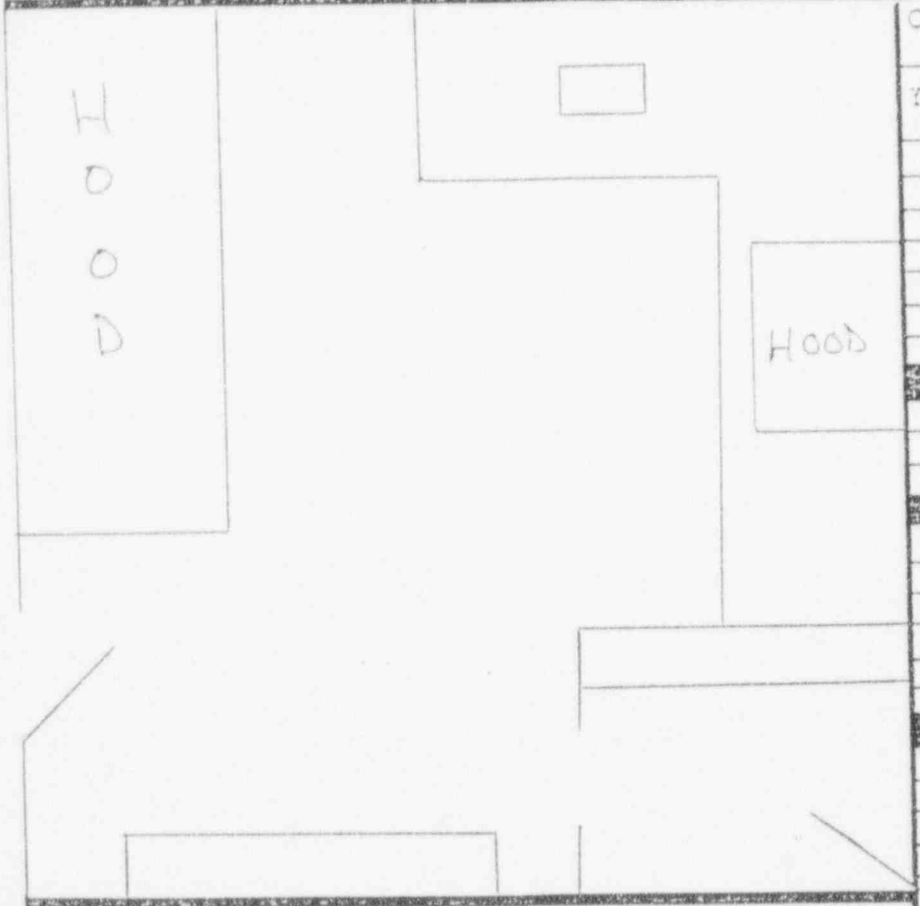
PHONE NO.

DATE (month, day, year) 9-3-92

SURVEYOR — NAME (last, first initial) Watts, C

PHONE NO.

SURVEY METER USED N/A



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
		(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 coats
		(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
		(21) Corridor storage meets requirements
		(22) Radiation levels < 2.5 mR/hr
		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 3H										
NUCLIDE 2										
NUCLIDE 3										

METER 1	METER 2	METER 3

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

No RAM Use

Rev. Oct 1990

ECOLOGY SERVICES, INC.

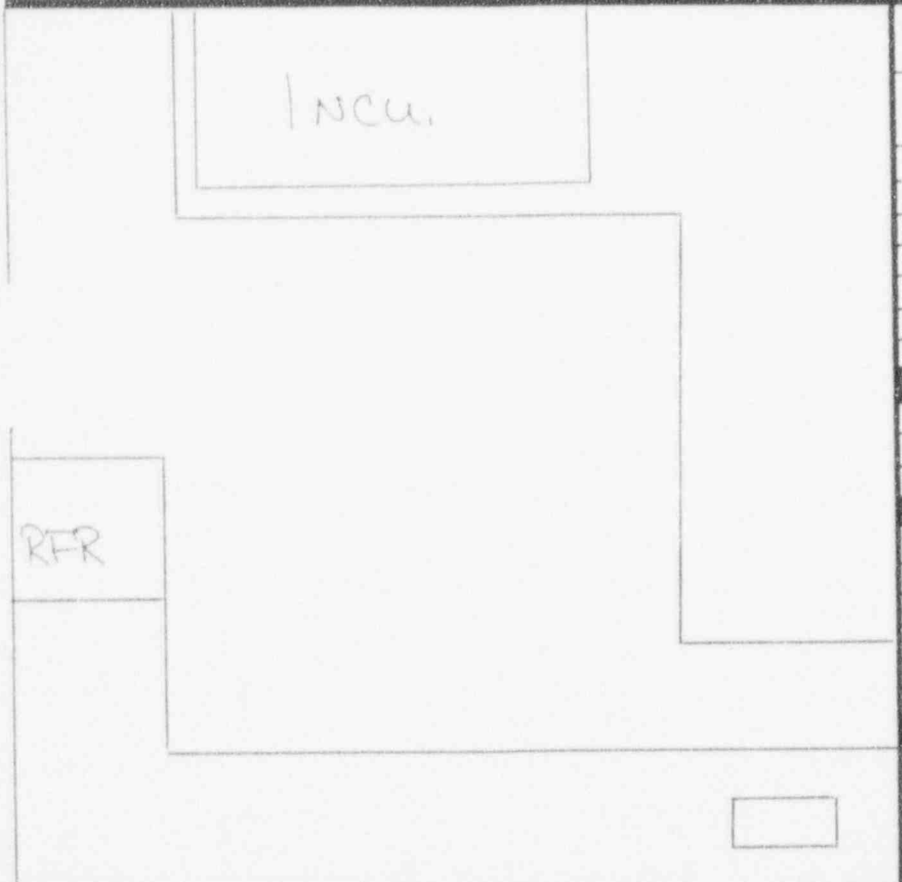
COMPANY NAME FDA

RADIATION SAFETY SURVEY

BLDG CVM

ROOM NO. 105

AUTHORIZED INVESTIGATOR	NAME (last, first initial) Myers, M.	PHONE NO.	DATE (month, day, year) 9-3-92
SURVEYOR	NAME (last, first initial)	PHONE NO.	SURVEY METER USED N/A



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
		(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 coats
		(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
		(21) Corridor storage meets requirements
		(22) Radiation levels < 2.5 mR/hr
		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 3H										
NUCLIDE 2										
NUCLIDE 3										

METER 1	METER 2	METER 3

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

No RAM Use

Rev. Oct 1990

ECOLOGY SERVICES, INC.

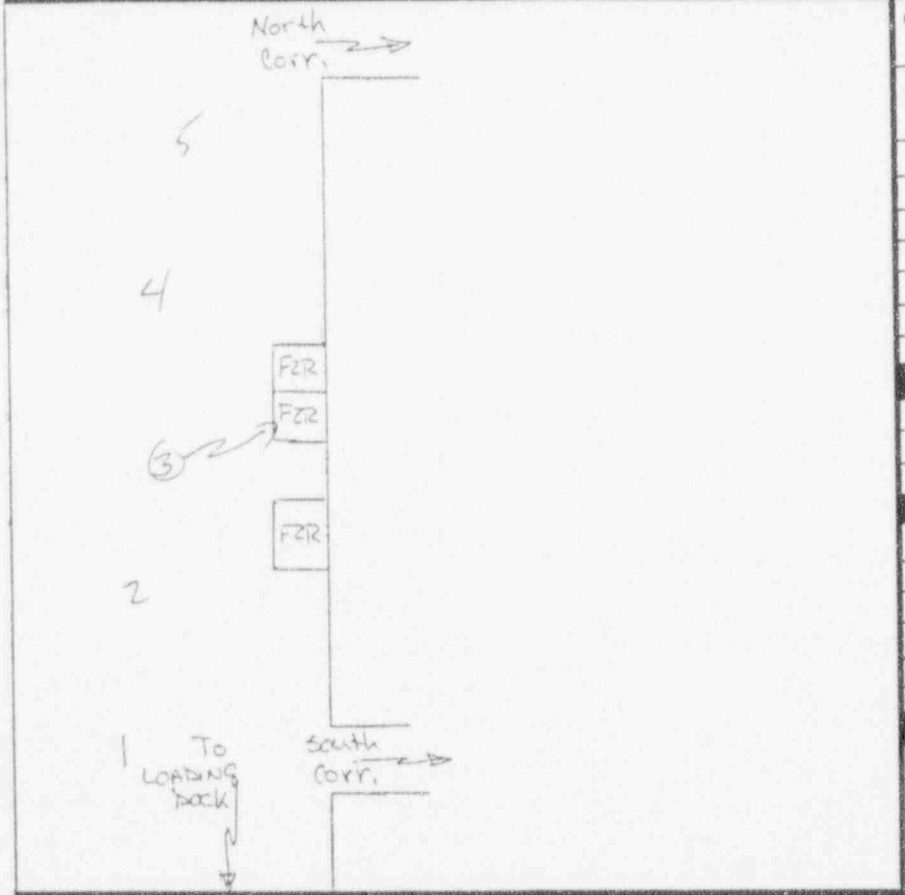
COMPANY NAME FDA

RADIATION SAFETY SURVEY

BLDG BRF

ROOM NO. West Corr.

AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE NO.	DATE (month, day, year) 9-3-92
SURVEYOR	NAME (last, first initial) WATTS, C	PHONE NO.	SURVEY METER USED L3 w/ 44-9



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
/	/	(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 coats
/	/	(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
/	/	(21) Corridor storage meets requirements
/	/	(22) Radiation levels < 2.5 mR/hr
/	/	(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

METER 1	METER 2	METER 3

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 P	<100	——	——	——	→					
NUCLIDE 2										
NUCLIDE 3										

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

Rev. Oct 1990

ECOLOGY SERVICES, INC.

RADIATION SAFETY SURVEY

COMPANY NAME FDA

BLDG BRF

ROOM NO North Corr.

AUTHORIZED INVESTIGATOR NAME (last, first initial)

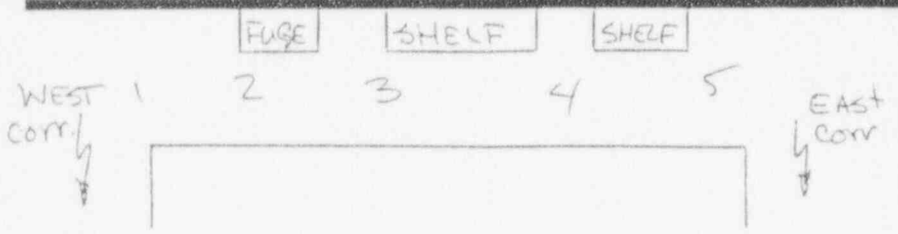
PHONE NO.

DATE (month, day, year) 9-3-92

SURVEYOR NAME (last, first initial) WATTS, C

PHONE NO.

SURVEY METER USED L3 w/ 44-9



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
		(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 coats
		(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
		(21) Corridor storage meets requirements
		(22) Radiation levels <2.5 mR/hr
		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

METER 1	METER 2	METER 3

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 β	<100		———→							
NUCLIDE 2										
NUCLIDE 3										

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

Rev. Oct 1990

ECOLOGY SERVICES, INC.

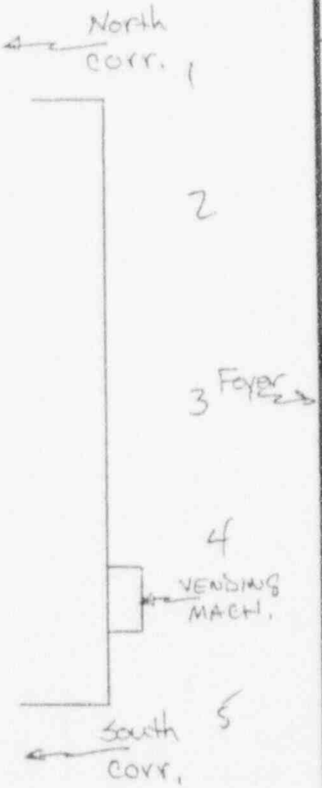
RADIATION SAFETY SURVEY

COMPANY NAME FDA

BLDG BRF

ROOM NO East Corr.

AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE NO.	DATE (month, day, year) 9-3-92
SURVEYOR	NAME (last, first initial) WATTS, C	PHONE NO.	SURVEY METER USED L3 w/ 44-9



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
/	/	(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 coats
/	/	(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
/	/	(21) Corridor storage meets requirements
/	/	(22) Radiation levels <2.5 mR/hr
/	/	(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100cm²)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 β	<100	→	→	→	→					
NUCLIDE 2										
NUCLIDE 3										

METER 1	METER 2	METER 3

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

Rev. Oct 1990

ECOLOGY SERVICES, INC.
300 Second St., Laurel, Maryland 207
(301) 498-1514

Company Name: FDA

RADIATION SAFETY SURVEY

Building / Room: BRF / LAB 18

Authorized Investigator: NAME:

Phone No.

Date: 9-3-92

Surveyor: NAME: WATTS, C

Phone No.

Survey Meter Used: L3 w/44-9

Compliance Items: Y - Compliance

Y N ☐ ☐
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
- ☑ ☐ Adequate use of Shielding
- ☑ ☐ Prohibition of eating, drinking, etc.
- ☑ ☐ Inventory & Disposal Records
- ☑ ☐ Survey Records Current
- ☑ ☐ Personnel Trained
- ☑ ☐ Prohibition on Mouth Pipetting
- ☑ ☐ Radiation Levels
- ☑ ☐ Contamination (Wipes) < 100 DPM/100 sq. cm.

Survey Instrument:

- ☐ ☐ Calibration Current
- ☐ ☐ Operational
- ☐ ☐ Available
- ☐ ☐ Other (Specify in Comments)

Wipe Sample Results:

LOCATION:	1	2	3	4	5	6	7	8	9	10
Nuclide 1 14C	<100	→	→	→	→	→	→	→	→	→
Nuclide 2										
Nuclide 3										
Nuclide 4										

Note: All wipe sample results are in units of DPM / 100 sq. cm.

Comments:

ESI Form HP5 1 Rev 1.0 1/92

ECOLOGY SERVICES, INC.

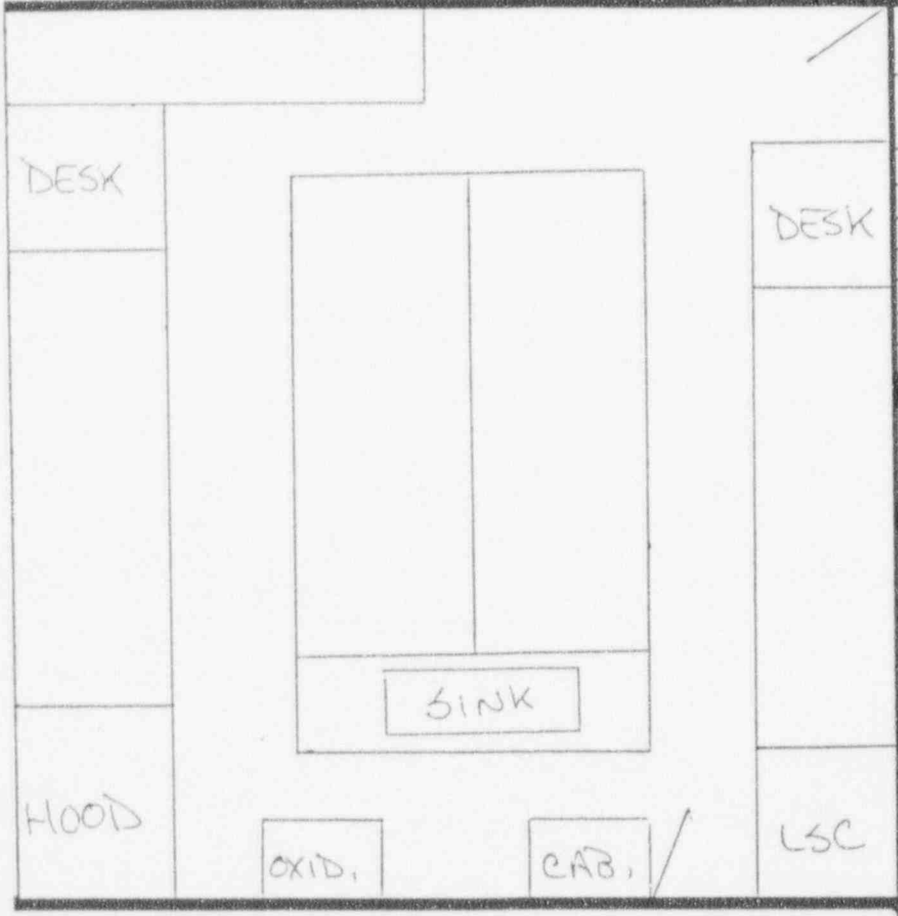
RADIATION SAFETY SURVEY

COMPANY NAME FDA

BLDG BRF

ROOM NO. 14

AUTHORIZED INVESTIGATOR	NAME (last, first initial) SAPENZIA, P	PHONE NO.	DATE (month, day, year) 9-3-92
SURVEYOR	NAME (last, first initial) WATTS C	PHONE NO.	SURVEY METER USED N/A



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
		(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 coats
		(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
		(21) Corridor storage meets requirements
		(22) Radiation levels < 2.5 mR/hr
		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1										
NUCLIDE 2										
NUCLIDE 3										

METER 1	METER 2	METER 3

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

No RAM use

Rev. Oct 1990

ECOLOGY SERVICES, INC.

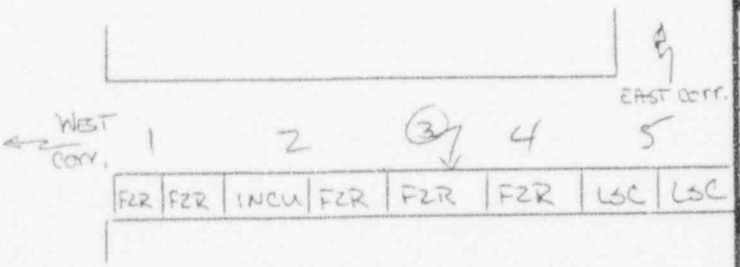
RADIATION SAFETY SURVEY

COMPANY NAME: FDA

BLDG. BRF

ROOM NO. South Corr.

AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE NO.	DATE (month, day, year) 9-3-92
SURVEYOR	NAME (last, first initial) WATTS C	PHONE NO.	SURVEY METER USED L3w/44-9



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
✓		(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 coats
✓		(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
✓		(21) Corridor storage meets requirements
✓		(22) Radiation levels <2.5 mR/hr
✓		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

METER 1	METER 2	METER 3

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100cm²)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 β	<100	→								
NUCLIDE 2										
NUCLIDE 3										

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

Rev. Oct 1990

ECOLOGY SERVICES, INC.

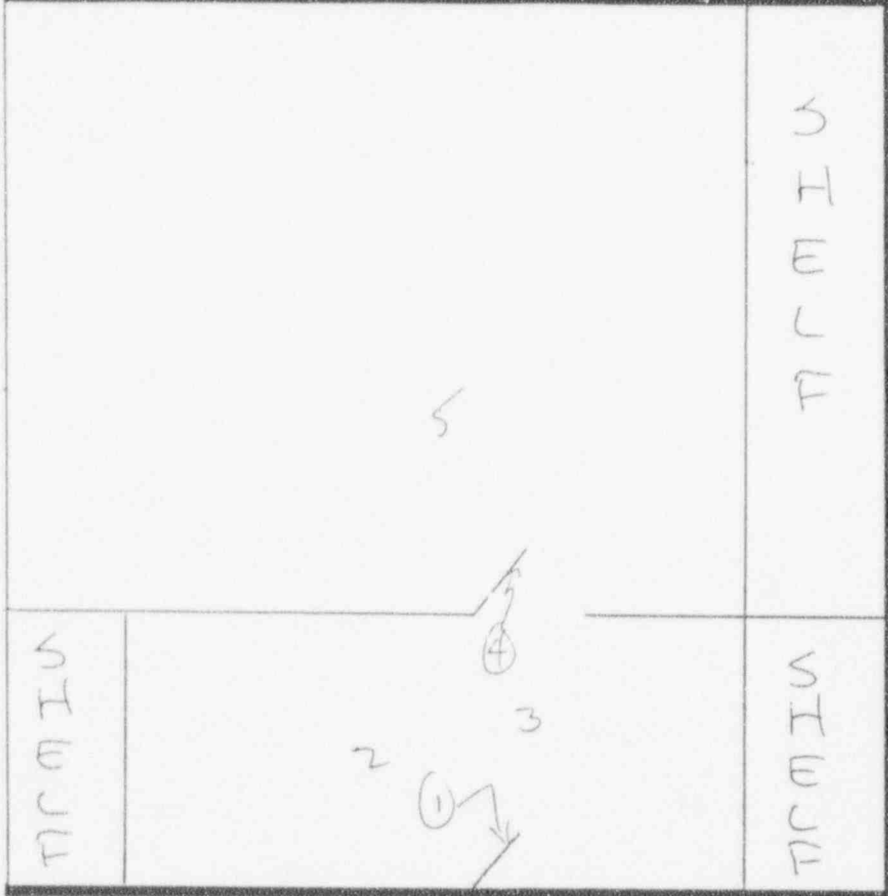
RADIATION SAFETY SURVEY

COMPANY NAME FDA

BLDG BRF

ROOM NO. Walk In Cold Rm

AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE NO.	DATE (month, day, year) 9-3-92
SURVEYOR	NAME (last, first initial) WATTS, C	PHONE NO.	SURVEY METER USED L3 w/ 44-9



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
✓		(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 coats
✓		(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
✓		(21) Corridor storage meets requirements
✓		(22) Radiation levels <2.5 mR/hr
		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 β	<100	→								
NUCLIDE 2										
NUCLIDE 3										

METER 1	METER 2	METER 3

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

Rev. Oct 1990

ECOLOGY SERVICES, INC.

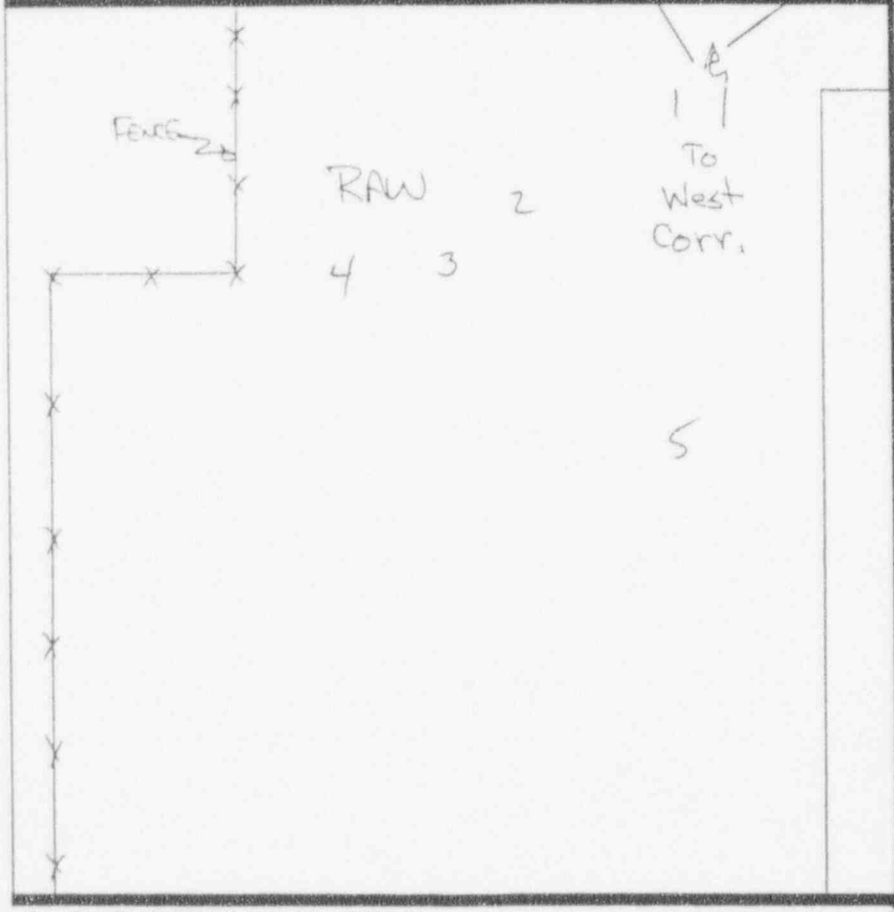
RADIATION SAFETY SURVEY

COMPANY NAME FDA

BLDG BRF

ROOM NO. LOADING DOCK

AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE NO.	DATE (month, day, year) 9-3-92
SURVEYOR	NAME (last, first initial) WATTS, C	PHONE NO.	SURVEY METER USED L3 w/ 44-9



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
/		(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 coats
/		(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
/		(21) Corridor storage meets requirements
/		(22) Radiation levels < 2.5 mR/hr
/		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

METER 1	METER 2	METER 3

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 β	<100		→							
NUCLIDE 2										
NUCLIDE 3										

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

NOTE: LABELLED FREEZER ON DOCK, WIPE #5 TAKEN ON LIQUID DRAINING FROM FREEZER

Rev. Oct 1990

ECOLOGY SERVICES, INC.

COMPANY NAME FDA

RADIATION SAFETY SURVEY

BLDG BRF

ROOM NO. 6

AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE NO.	DATE (month, day, year) 9-3-92
SURVEYOR	NAME (last, first initial) WATTS, C	PHONE NO.	SURVEY METER USED L3 w/ 44-9

COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
		(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 coats
		(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
		(21) Corridor storage meets requirements
		(22) Radiation levels <2.5 mR/hr
		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

METER 1	METER 2	METER 3

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 β	<100	→								→
NUCLIDE 2										
NUCLIDE 3										

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

Rev. Oct 1990

ECOLOGY SERVICES, INC.

COMPANY NAME FDA

RADIATION SAFETY SURVEY

BLDG FB8

ROOM NO. 6446

AUTHORIZED INVESTIGATOR — NAME (last, first initial) — PHONE NO. — DATE (month, day, year) 9-11-92

SURVEYOR — NAME (last, first initial) WATTS, C — PHONE NO. — SURVEY METER USED L3 w/ 44-9

COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
/		(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 coats
/		(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
		(21) Corridor storage meets requirements
/		(22) Radiation levels < 2.5 mR/hr
/		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

METER 1	METER 2	METER 3

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 β	<100	→								→
NUCLIDE 2										
NUCLIDE 3										

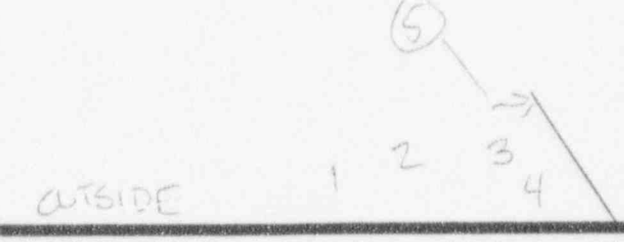
REMARKS: *(Refer to item No. . Include violations corrected by supervisor.)*

Rev. Oct 1990

ECOLOGY SERVICES, INC.

RADIATION SAFETY SURVEY

COMPANY NAME	FDA		
BLDG.	FB8	ROOM NO.	GARAGE
AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE NO.	DATE (month, day, year) 9-11-92
SURVEYOR	NAME (last, first initial) WATTS C	PHONE NO.	SURVEY METER USED L3 w/ 44-9



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
✓		(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 coats
✓		(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
✓		(21) Corridor storage meets requirements
✓		(22) Radiation levels <2.5 mR/hr
✓		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 B	<100	→	→	→	→					
NUCLIDE 2										
NUCLIDE 3										

METER 1	METER 2	METER 3

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

Rev. Oct 1990

ECOLOGY SERVICES, INC.

COMPANY NAME FDA

RADIATION SAFETY SURVEY

BLDG FB8

ROOM NO. 3756

AUTHORIZED INVESTIGATOR NAME (last, first initial)

PHONE NO.

DATE (month, day, year) 9-11-92

SURVEYOR NAME (last, first initial) WATTS, C.

PHONE NO.

SURVEY METER USED L3 w/ 44-9

COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
✓		(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 coats
✓		(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
✓		(21) Corridor storage meets requirements
✓		(22) Radiation levels < 2.5 mR/hr
✓		(23) Contamination (smears) < 100 dpm
✓		(24) Calibration current
✓		(25) Survey meters operational
✓		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

METER 1	METER 2	METER 3

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 β	<100	→								→
NUCLIDE 2										
NUCLIDE 3										

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

METER SN 8000 OUT OF CAL.

Rev. Oct 1990

ECOLOGY SERVICES, INC.

COMPANY NAME FDA

RADIATION SAFETY SURVEY

BLDG FB8
ROOM NO. 2266

AUTHORIZED INVESTIGATOR NAME (last, first initial)
PHONE NO.
DATE (month, day, year) 9-11-92

SURVEYOR NAME (last, first initial) WATTS, C
PHONE NO.
SURVEY METER USED N/A

COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
☐	☐	(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 coats
☐	☐	(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
☐	☐	(21) Corridor storage meets requirements
☐	☐	(22) Radiation levels < 2.5 mR/hr
☐	☐	(23) Contamination (smears) < 100 dpm
☐	☐	(24) Calibration current
☐	☐	(25) Survey meters operational
☐	☐	(26) Survey meters available
☐	☐	(27) Other (SPECIFY IN REMARKS)

METER 1	METER 2	METER 3

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 3H	<100									→
NUCLIDE 2										
NUCLIDE 3										

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

CIGARETTE BUTS IN WASTE CAN; PRESUMPTIVE EVIDENCE

Rev. Oct 1990

ECOLOGY SERVICES, INC.

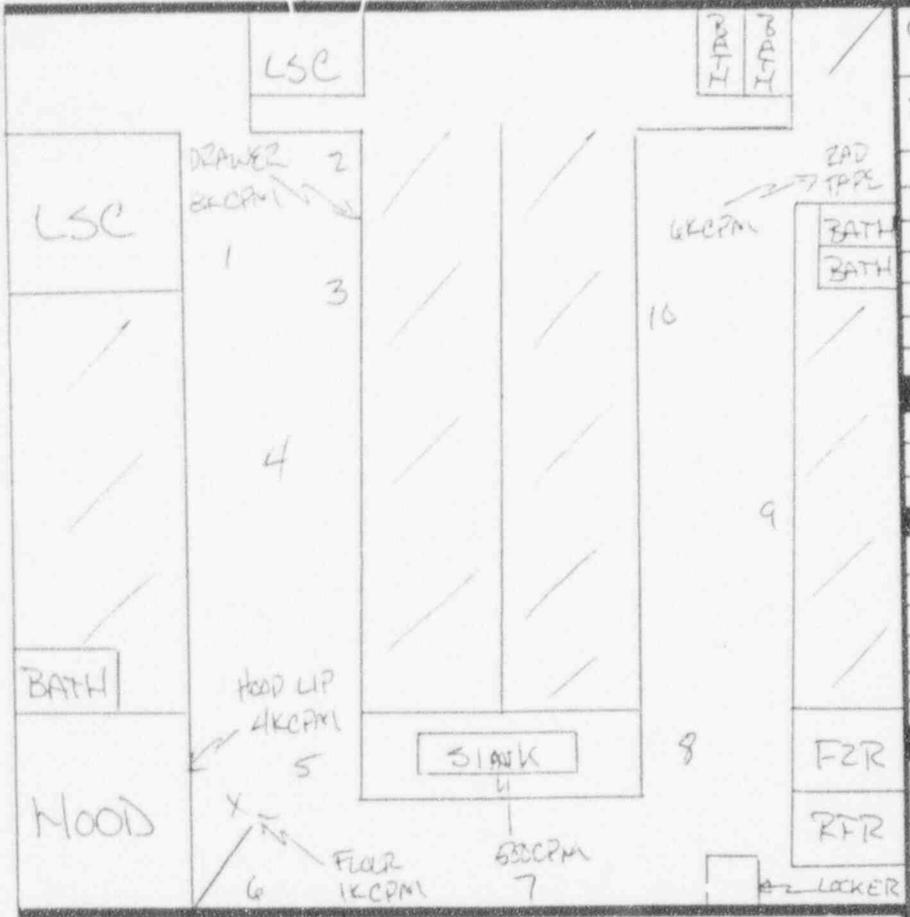
RADIATION SAFETY SURVEY

COMPANY NAME FDA

BLDG FB8

ROOM NO. 3838

AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE NO.	DATE (month, day, year) 9-11-92
SURVEYOR	NAME (last, first initial) WATTS, C	PHONE NO.	SURVEY METER USED L3 w/ 44-9



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
/		(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 coats
/		(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
/		(21) Corridor storage meets requirements
/		(22) Radiation levels <2.5 mR/hr
/		(23) Contamination (smears) < 100 dpm
	/	(24) Calibration current
/		(25) Survey meters operational
/		(26) Survey meters available
	/	(27) Other (SPECIFY IN REMARKS)

METER 1	METER 2	METER 3

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 β	<100									
NUCLIDE 2										
NUCLIDE 3										

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

SINK CONTAMINATED; 1730 dpm/20cm^2

METER SN 86868 OUT OF CAL.

MULTIPLE AREAS OF CONTAMINATION THROUGHOUT LAB

(3653 dpm/20cm^2 to 30,576 dpm/20cm^2)

Rev. Oct 1990

ECOLOGY SERVICES, INC.

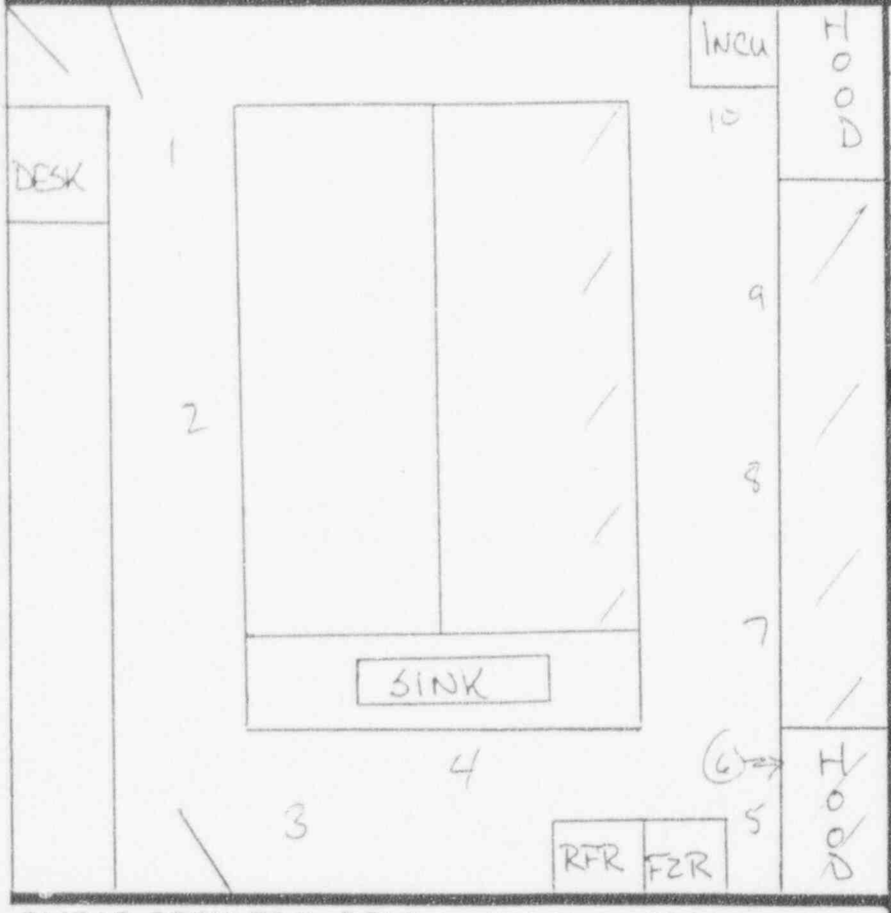
COMPANY NAME FDA

RADIATION SAFETY SURVEY

BLDG FB8

ROOM NO. 6846

	NAME (last, first initial)	PHONE NO.	
AUTHORIZED INVESTIGATOR			DATE (month, day, year) 9-11-92
SURVEYOR	WATTS, C		SURVEY METER USED L3 w/ 44-9



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
✓		(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 coats
✓		(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
✓		(21) Corridor storage meets requirements
✓		(22) Radiation levels <2.5 mR/hr
✓		(23) Contamination (smears) < 100 dpm
✓		(24) Calibration current
✓		(25) Survey meters operational
✓		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 B	<100	—	—	—	—	—	—	—	—	→
NUCLIDE 2										
NUCLIDE 3										

METER 1	METER 2	METER 3

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

Rev. Oct 1990

ECOLOGY SERVICES, INC.

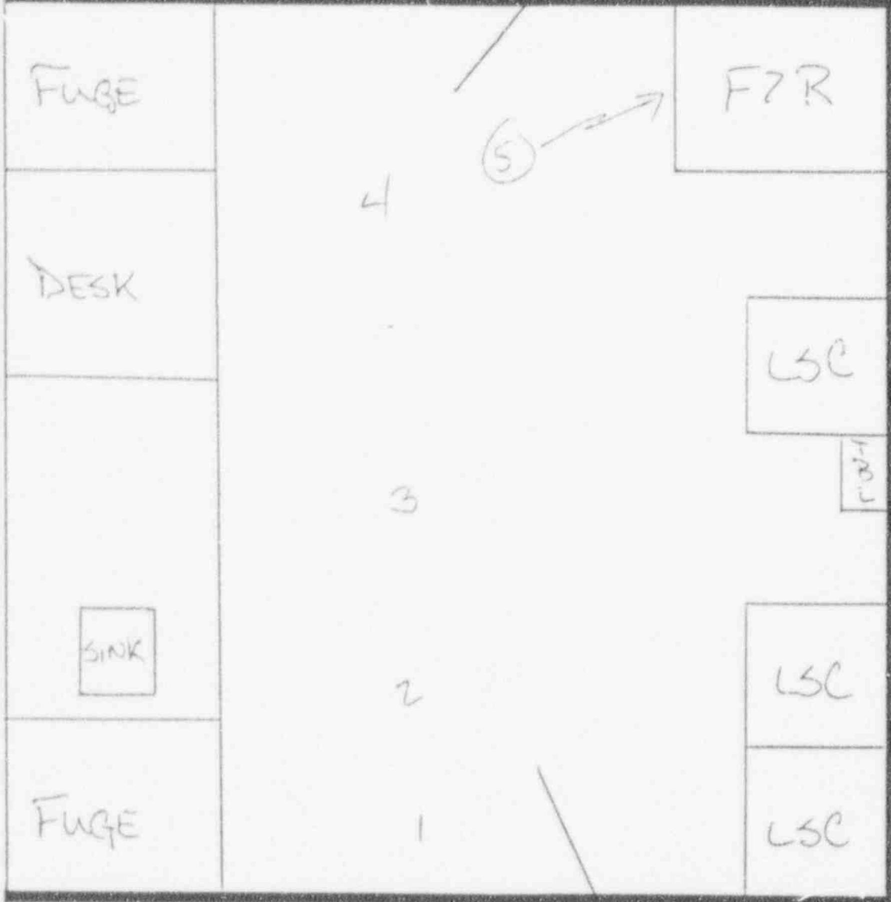
COMPANY NAME FDA

RADIATION SAFETY SURVEY

BLDG FB8

ROOM NO. 6448

AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE NO.	DATE (month, day, year) 9-11-92
SURVEYOR	NAME (last, first initial) WATTS, C	PHONE NO	SURVEY METER USED L3 w/ 44-9



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
✓		(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 coats
✓		(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
✓		(21) Corridor storage meets requirements
✓		(22) Radiation levels <2.5 mR/hr
✓		(23) Contamination (smears) <100 dpm
		(24) Calibration current
		(25) Survey meters operational
		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

METER 1	METER 2	METER 3

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 β	<100	→	→	→	→					
NUCLIDE 2										
NUCLIDE 3										

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

Rev. Oct 1990

ECOLOGY SERVICES, INC.

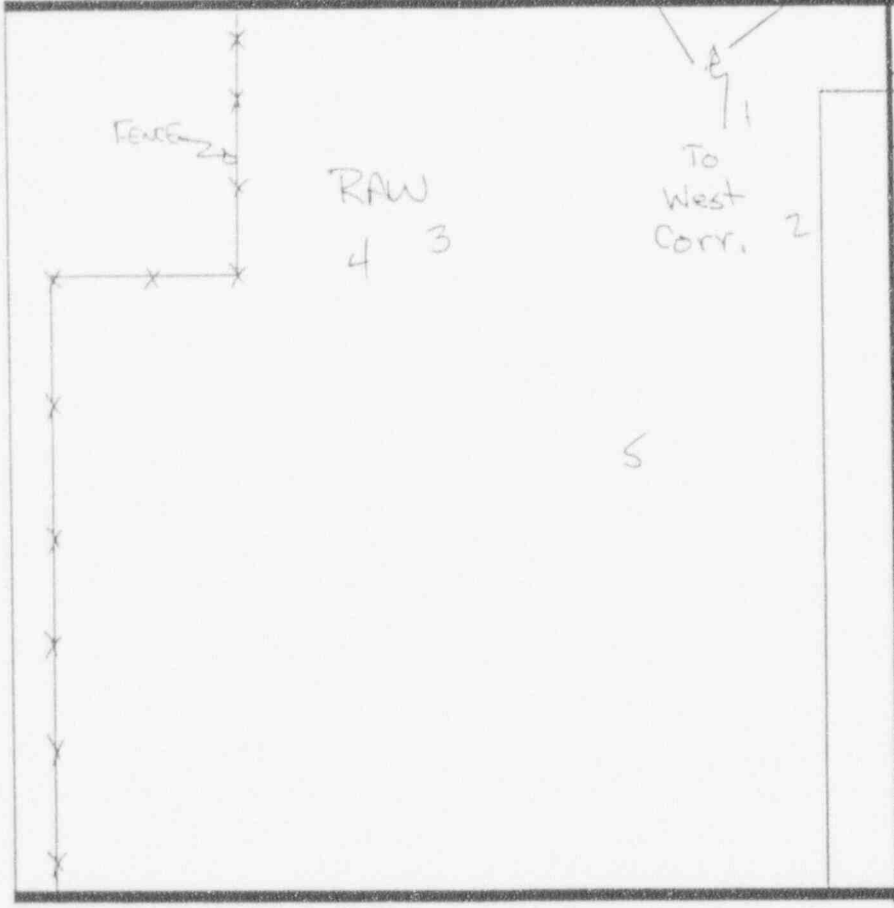
RADIATION SAFETY SURVEY

COMPANY NAME FDA

BLDG BRF

ROOM NO. LOADING DOCK

AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE NO.	DATE (month, day, year) 8-18-92
SURVEYOR	NAME (last, first initial) WATTS, C	PHONE NO.	SURVEY METER USED L3 w/ 44-9



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
/		(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 coats
/		(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
/		(21) Corridor storage meets requirements
/		(22) Radiation levels < 2.5 mR/hr
/		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 P	<100	→	→	→	→					
NUCLIDE 2										
NUCLIDE 3										

METER 1	METER 2	METER 3

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

Rev. Oct 1990

ECOLOGY SERVICES, INC.

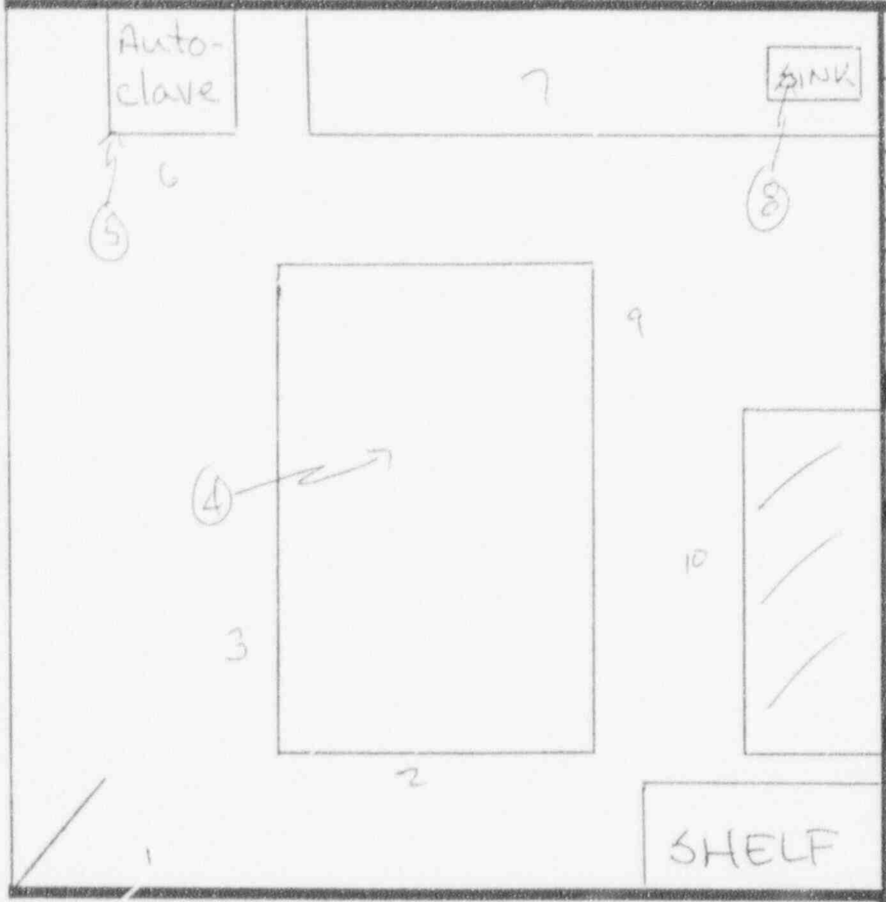
COMPANY NAME FDA

RADIATION SAFETY SURVEY

BLDG BRF

ROOM NO. 6

AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE NO.	DATE (month, day, year) 8-18-92
SURVEYOR	NAME (last, first initial) Watts, C	PHONE NO.	SURVEY METER USED L3 w/ 44-9



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
/		(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 coats
/	/	(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
/		(21) Corridor storage meets requirements
/		(22) Radiation levels < 2.5 mR/hr
/		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

METER 1	METER 2	METER 3

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 P	<100 →									
NUCLIDE 2										
NUCLIDE 3										

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

Rev. Oct 1990

ECOLOGY SERVICES, INC.

COMPANY NAME FDA

RADIATION SAFETY SURVEY

BLDG BRF

ROOM NO. West Corr.

AUTHORIZED INVESTIGATOR — NAME (last, first initial)

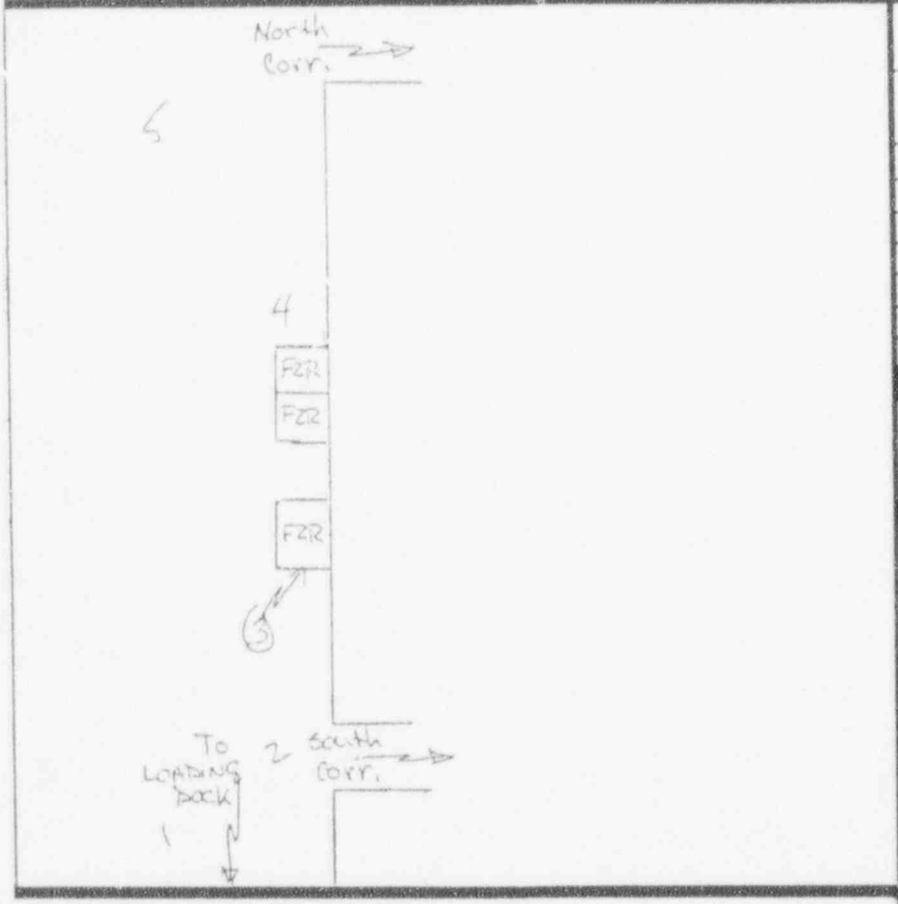
PHONE NO.

DATE (month, day, year) 8-18-92

SURVEYOR — NAME (last, first initial) WATTS, C

PHONE NO.

SURVEY METER USED L3 w/ 44-9



SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 P	<100	→	→	→	→					
NUCLIDE 2										
NUCLIDE 3										

COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
✓		(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 coats
✓		(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
		(21) Corridor storage meets requirements
✓		(22) Radiation levels < 2.5 mR/hr
✓		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

METER 1	METER 2	METER 3

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

Rev. Oct 1990

ECOLOGY SERVICES, INC.

COMPANY NAME FDA

RADIATION SAFETY SURVEY

BLDG BRF

ROOM NO North Corr.

AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE NO.	DATE (month, day, year) 8-18-92
SURVEYOR	NAME (last, first initial) WATTS, C	PHONE NO.	SURVEY METER USED 13 w/ 44-9

COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
/	/	(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 coats
/		(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
/		(21) Corridor storage meets requirements
/	/	(22) Radiation levels <2.5 mR/hr
/		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

METER 1	METER 2	METER 3

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 P	<100	→	→	→	→					
NUCLIDE 2										
NUCLIDE 3										

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

Rev. Oct 1990

ECOLOGY SERVICES, INC.

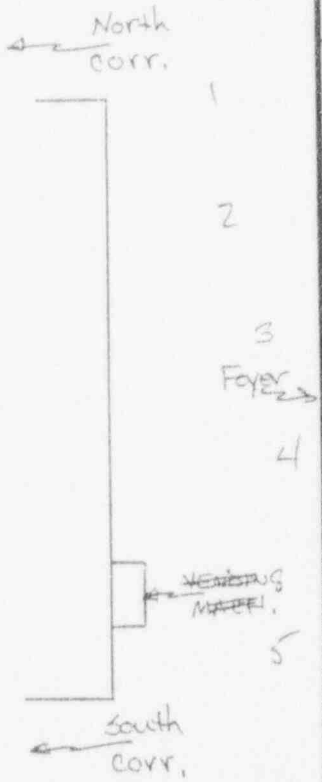
COMPANY NAME FDA

RADIATION SAFETY SURVEY

BLDG. BRF

ROOM NO. East Corr.

AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE NO.	DATE (month, day, year) 8-18-92
SURVEYOR	NAME (last, first initial) Watts, C	PHONE NO.	SURVEY METER USED L3 w/ 44-9



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
✓		(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 coats
✓		(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
✓		(21) Corridor storage meets requirements
✓		(22) Radiation levels < 2.5 mR/hr
✓		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 ^{32}P	<100	—	—	—	→					
NUCLIDE 2										
NUCLIDE 3										

METER 1	METER 2	METER 3

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

Rev. Oct 1990

ECOLOGY SERVICES, INC.
300 Second St., Laurel, Maryland 2070
(301) 498-1514

Company Name: FDA

RADIATION SAFETY SURVEY

Building / Room: BRF / LAB 18

Authorized Investigator: NAME:

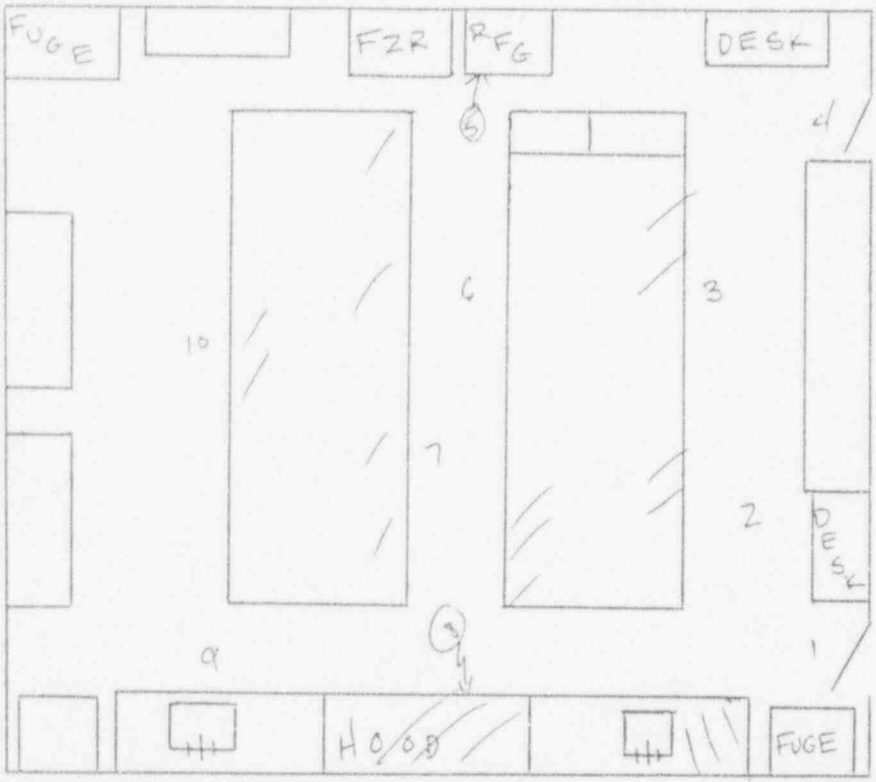
Phone No.

Date: 8-18-92

Surveyor: NAME: WATTS. C

Phone No.

Survey Meter Used: 13-44-9



Wipe Sample Results:

LOCATION:	1	2	3	4	5	6	7	8	9	10
Nuclide 1 ^{14}C	<100									
Nuclide 2										
Nuclide 3										
Nuclide 4										

Note: All wipe sample results are in units of DPM / 100 sq. cm.

Comments:

Compliance Items: Y - Compliance

Y N
☐ ☐ 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
- ☐ ☐ Adequate use of Shielding
- ☐ ☐ Prohibition of eating, drinking, etc.
- ☐ ☐ Inventory & Disposal Records
- ☐ ☐ Survey Records Current
- ☐ ☐ Personnel Trained
- ☐ ☐ Prohibition on Mouth Pipetting
- ☐ ☐ Radiation Levels
- ☐ ☐ Contamination (Wipes) < 100 DPM/100 sq. cm.

Survey Instrument:

- ☐ ☐ Calibration Current
- ☐ ☐ Operational
- ☐ ☐ Available
- ☐ ☐ Other (Specify in Comments)

ESI Form HPS 1 Rev 1.0 1/92

ECOLOGY SERVICES, INC.

RADIATION SAFETY SURVEY

COMPANY NAME FDA

BLDG BRF

ROOM NO. 14

AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE NO.	DATE (month, day, year) 8-18-92
SURVEYOR	NAME (last, first initial) WATTS, C	PHONE NO.	SURVEY METER USED L3 w/ 44-9

COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
✓		(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 coats
✓		(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
✓		(21) Corridor storage meets requirements
✓		(22) Radiation levels < 2.5 mR/hr
✓		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

METER 1	METER 2	METER 3

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 14C	<100	→								
NUCLIDE 2										
NUCLIDE 3										

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

COULD NOT LOCATE INVENTORY/DISPOSAL OR SURVEY RECORDS

Rev. Oct 1990

ECOLOGY SERVICES, INC.

COMPANY NAME FDA

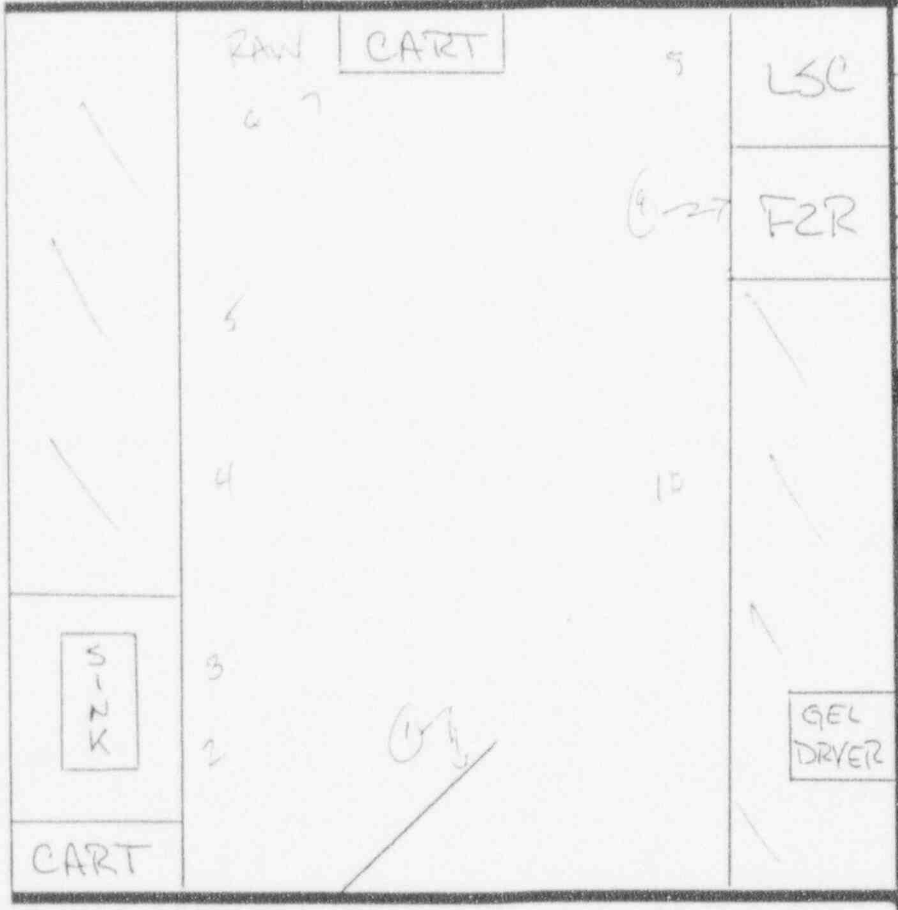
RADIATION SAFETY SURVEY

BLDG FB8

ROOM NO. 3756

	NAME (last, first initial)	PHONE NO.	DATE (month, day, year)
AUTHORIZED INVESTIGATOR			8-5-92

	NAME (last, first initial)	PHONE NO.	SURVEY METER USED
SURVEYOR	Watts, C		L3 w 44-9



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
✓		(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 coats
✓		(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
		(21) Corridor storage meets requirements
✓		(22) Radiation levels < 2.5 mR/hr
✓		(23) Contamination (smears) < 100 dpm
✓	✓	(24) Calibration current
✓		(25) Survey meters operational
✓		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

METER 1	METER 2	METER 3

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 P	<100	→								→
NUCLIDE 2										
NUCLIDE 3										

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

Rev. Oct 1990

ECOLOGY SERVICES, INC.

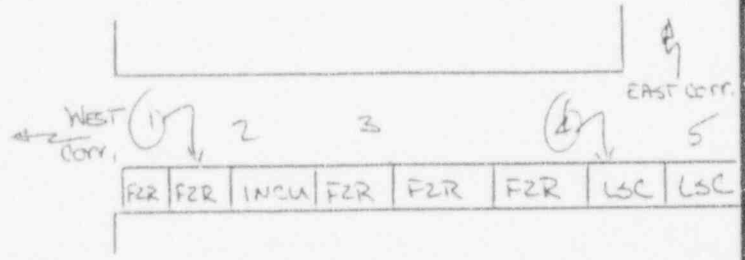
COMPANY NAME FDA

RADIATION SAFETY SURVEY

BLDG. BRF

ROOM NO. South Corr.

AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE NO.	DATE (month, day, year) 8-18-92
SURVEYOR	NAME (last, first initial) WATTS, C	PHONE NO.	SURVEY METER USED L3 w/ 44-9



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
✓		(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 coats
✓		(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
✓		(21) Corridor storage meets requirements
✓		(22) Radiation levels <2.5 mR/hr
✓		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

METER 1	METER 2	METER 3

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 P	<100	————→								
NUCLIDE 2										
NUCLIDE 3										

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

Rev. Oct 1990

ECOLOGY SERVICES, INC.

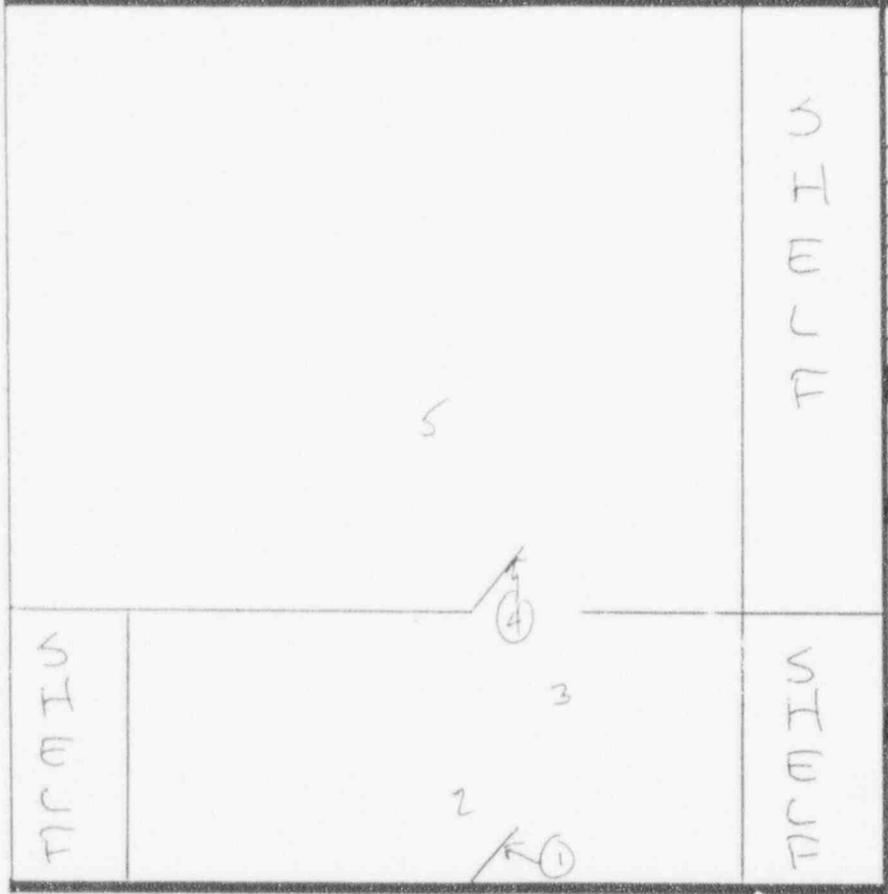
COMPANY NAME FDA

RADIATION SAFETY SURVEY

BLDG BRF

ROOM NO. Walk In Cold Rm.

AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE NO.	DATE (month, day, year) 8-18-92
SURVEYOR	NAME (last, first initial) Watts C	PHONE NO.	SURVEY METER USED L3 w/ 44-9



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
✓		(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 coats
✓		(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
✓		(21) Corridor storage meets requirements
✓		(22) Radiation levels <2.5 mR/hr
✓		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

METER 1	METER 2	METER 3

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm²)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 β	<100	⟶	⟶	⟶	⟶					
NUCLIDE 2										
NUCLIDE 3										

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

Rev. Oct 1990

ECOLOGY SERVICES, INC.

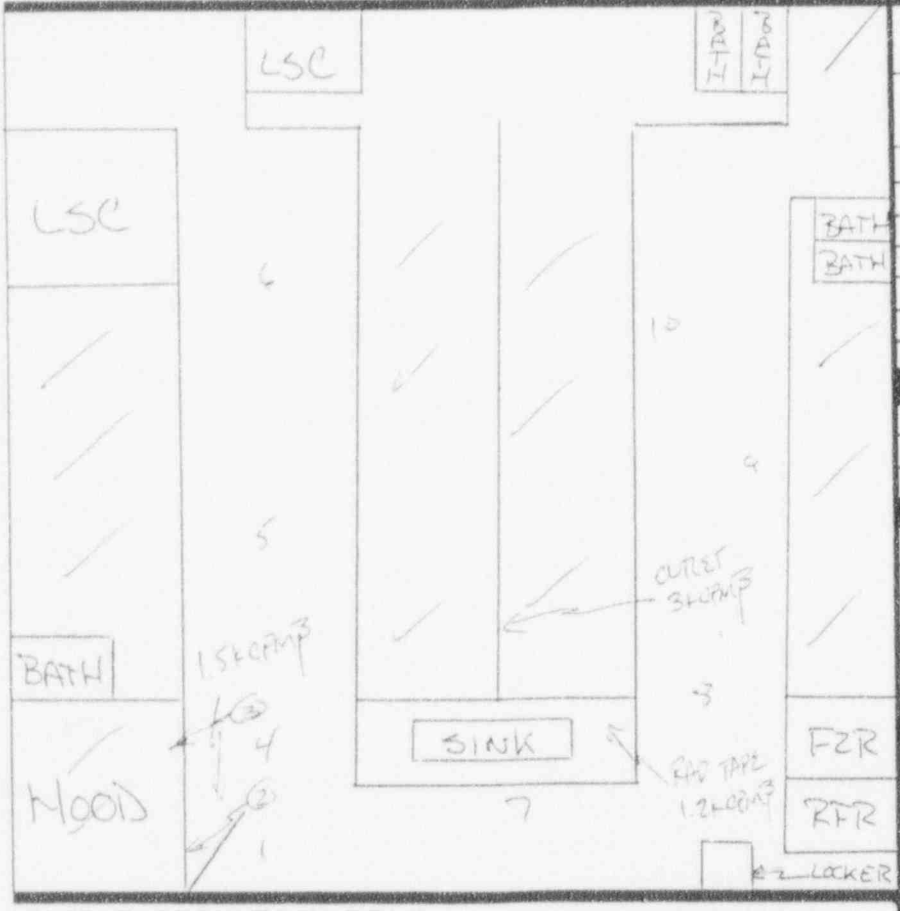
COMPANY NAME FDA

RADIATION SAFETY SURVEY

BLDG FB8

ROOM NO. 3838

AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE NO.	DATE (month, day, year) 8-5-92
SURVEYOR	NAME (last, first initial) WATTS C	PHONE NO.	SURVEY METER USED L3 w/ 44-9



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
✓		(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 coats
✓		(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
✓		(21) Corridor storage meets requirements
✓		(22) Radiation levels < 2.5 mR/hr
✓		(23) Contamination (smears) < 100 dpm
✓		(24) Calibration current
	✓	(25) Survey meters operational
✓		(26) Survey meters available
	✓	(27) Other (SPECIFY IN REMARKS)

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm²)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 [illegible]	<100	———	———	———	———	———	———	———	———	——>
NUCLIDE 2										
NUCLIDE 3										

METER 1	METER 2	METER 3

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

FLOOR CONTAMINATED; 5577 dpm/20 cm²

OUTLET CONTAMINATED; 11,346 dpm/20 cm²

RAD TAPE CONTAMINATED; 4,423 dpm/20 cm²

Rev. Oct 1990

ECOLOGY SERVICES, INC.

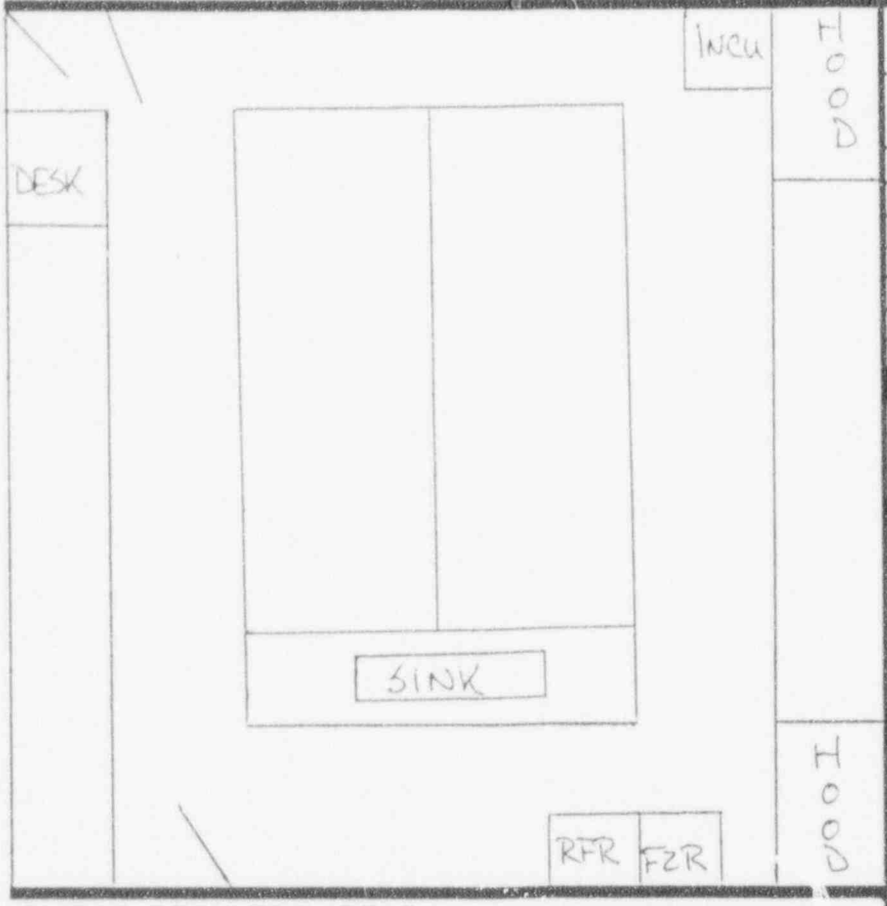
RADIATION SAFETY SURVEY

COMPANY NAME FDA

BLDG FB8

ROOM NO. 6846

AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE NO.	DATE (month, day, year) 9-5-92
SURVEYOR	NAME (last, first initial) Watts C	PHONE NO.	SURVEY METER USED



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
		(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 coats
		(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
		(21) Corridor storage meets requirements
		(22) Radiation levels < 2.5 mR/hr
		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

METER 1	METER 2	METER 3

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1										
NUCLIDE 2										
NUCLIDE 3										

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

No RAM Use

Rev. Oct 1990

ECOLOGY SERVICES, INC.

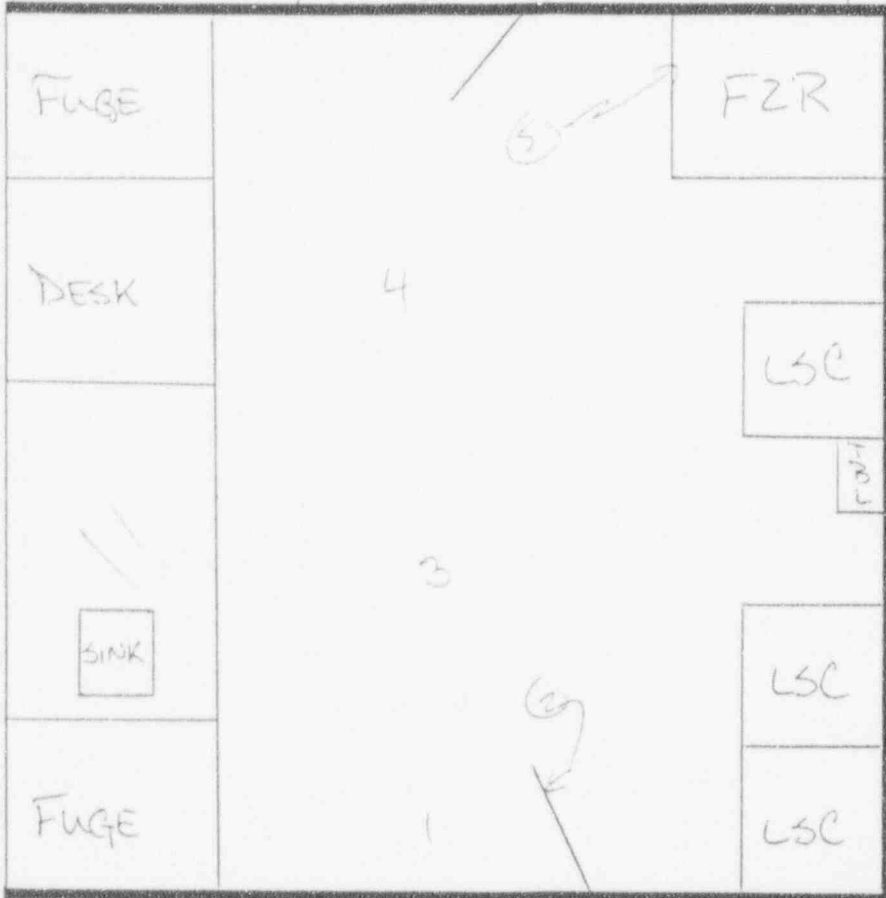
RADIATION SAFETY SURVEY

COMPANY NAME FDA

BLDG FB8

ROOM NO. 6448

AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE NO.	DATE (month, day, year) 8-5-97
SURVEYOR	NAME (last, first initial) Watts C	PHONE NO.	SURVEY METER USED L3 w/ 44-9



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
✓		(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 coats
	✓	(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
✓		(21) Corridor storage meets requirements
✓		(22) Radiation levels <2.5 mR/hr
✓		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

METER 1	METER 2	METER 3

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 P	<100	→	→	→	→					
NUCLIDE 2										
NUCLIDE 3										

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

Rev. Oct 1990

ECOLOGY S_RVICES, INC.

RADIATION SAFETY SURVEY

.OMPANY NAME FDA

BLDG FB8

ROOM NO. 6446

AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE NO.	DATE (month, day, year) 8-5-92
SURVEYOR	NAME (last, first initial) Watts, C	PHONE NO.	SURVEY METER USED L3 w/ 44-9

COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
✓		(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 coats
✓		(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
		(21) Corridor storage meets requirements
✓		(22) Radiation levels <2.5 mR/hr
✓		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 P	<100	→								
NUCLIDE 2										
NUCLIDE 3										

METER 1	METER 2	METER 3

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

Rev. Oct 1990

ECOLOGY SERVICES, INC.

COMPANY NAME FDA

RADIATION SAFETY SURVEY

BLDG FB8

ROOM NO. 2266

AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE NO.	DATE (month, day, year) 8-5-92
SURVEYOR	NAME (last, first initial) Watts C	PHONE NO.	SURVEY METER USED N/A

COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
✓		(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 coats
		(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
✓		(21) Corridor storage meets requirements
✓		(22) Radiation levels <2.5 mR/hr
✓		(23) Contamination (smears) <100 dpm
		(24) Calibration current
		(25) Survey meters operational
		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 3H	<100 →									
NUCLIDE 2										
NUCLIDE 3										

METER 1	METER 2	METER 3

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

Rev. Oct 1990

ECOLOGY SERVICES, INC.
300 Second St., Laurel, Maryland 20707
(301) 498-1574

Company Name: FDA

RADIATION SAFETY SURVEY

Building / Room: MOD 1 / 2305

Authorized Investigator: NAME:

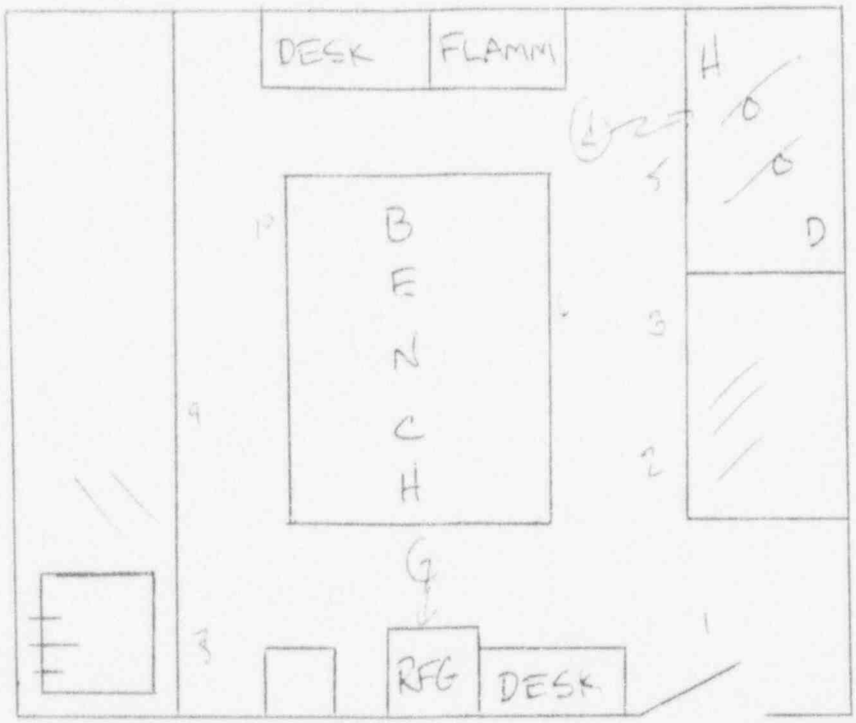
Phone No.

Date: 8-18-92

Surveyor: NAME: WATTS, C

Phone No.

Survey Meter Used: L3.JUU-9



Wipe Sample Results:

LOCATION:	1	2	3	4	5	6	7	8	9	10
Nuclide 1 P	<100	→	→	→	→	→	→	→	→	→
Nuclide 2										
Nuclide 3										
Nuclide 4										

Note: All wipe sample results are in units of DPM / 100 sq. cm.

Comments:

Compliance Items: Y - Compliance

Y N
☐ ☐
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
- ☐ ☐ Adequate use of Shielding
- ☑ ☐ Prohibition of eating, drinking, etc.
- ☑ ☐ Inventory & Disposal Records
- ☑ ☐ Survey Records Current
- ☑ ☐ Personnel Trained
- ☑ ☐ Prohibition on Mouth Pipetting
- ☑ ☐ Radiation Levels
- ☑ ☐ Contamination (Wipes) < 100 DPM/100 sq. cm.

Survey Instrument:

- ☐ ☐ Calibration Current
- ☐ ☐ Operational
- ☐ ☐ Available
- ☐ ☐ Other (Specify in Comments)

ESI Form HPS 1 Rev 1.0 1/92

ECOLOGY SERVICES, INC.
300 Second St., Laurel, Maryland 20707
(301) 498-1514

Company Name: FDA

RADIATION SAFETY SURVEY

Building / Room: MOD 1 / 2418

Authorized Investigator: NAME:

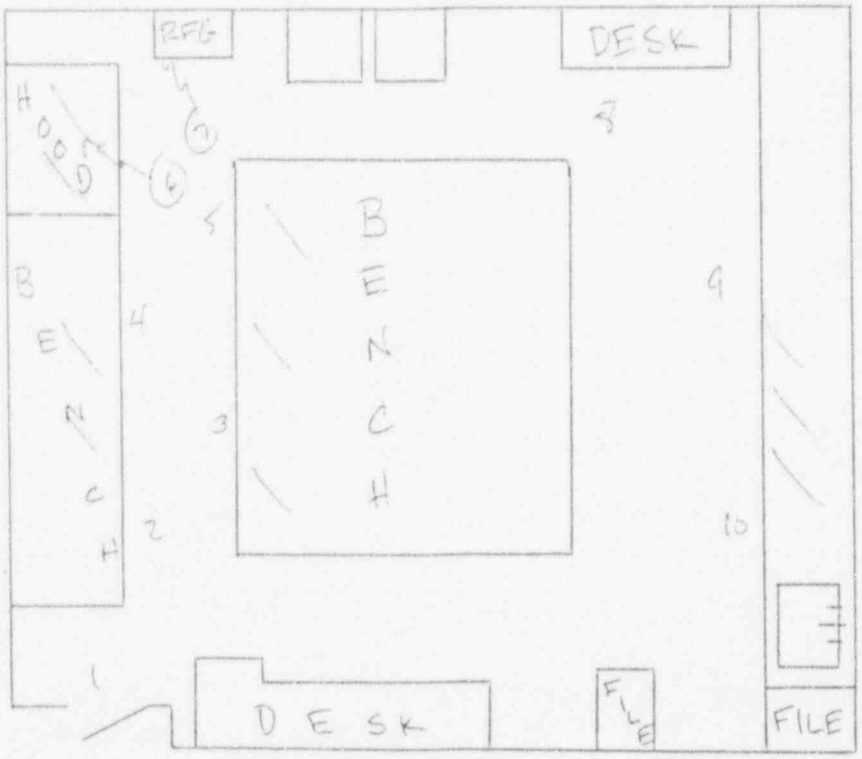
Phone No.

Date: 8-18-92

Surveyor: NAME: WATTS, C

Phone No.

Survey Meter Used: L3 w/44-9



Compliance Items: Y - Compliance

Y N 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
- ☑ ☐ Adequate use of Shielding
- ☑ ☐ Prohibition of eating, drinking, etc.
- ☑ ☐ Inventory & Disposal Records
- ☑ ☐ Survey Records Current
- ☑ ☐ Personnel Trained
- ☑ ☐ Prohibition on Mouth Pipetting
- ☑ ☐ Radiation Levels
- ☑ ☐ Contamination (Wipes) < 100 DPM/100 sq. cm.

Survey Instrument:

- ☐ ☐ Calibration Current
- ☐ ☐ Operational
- ☐ ☐ Available
- ☐ ☐ Other (Specify in Comments)

Wipe Sample Results:

LOCATION:	1	2	3	4	5	6	7	8	9	10
Nuclide 1 P	<100									→
Nuclide 2										
Nuclide 3										
Nuclide 4										

Note: All wipe sample results are in units of DPM / 100 sq. cm.

Comments:

ESI Form HPS 1 Rev 1.0 1/92

ECOLOGY SERVICES, INC.
300 Second St., Laurel, Maryland 20707
(301) 498-1514

Company Name: FDA

RADIATION SAFETY SURVEY

Building / Room: MOD 1 / 1107

Authorized Investigator: NAME:

Phone No.

Date: 5-18-92

Surveyor: NAME: Watts, C

Phone No.

Survey Meter Used

Compliance Items: Y - Compliance
N - Non-Compliance
Blank - Not Evaluated

Y N
☐ ☐

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, etc.
☐ ☐ Inventory & Disposal Records
☐ ☐ Survey Records Current
☐ ☐ Personnel Trained
☐ ☐ Prohibition on Mouth Pipetting
☐ ☐ Radiation Levels
☐ ☐ Contamination (Wipes) < 100 DPM/100 sq. cm.

Survey Instrument:
☐ ☐ Calibration Current
☐ ☐ Operational
☐ ☐ Available
☐ ☐ Other (Specify in Comments)

Wipe Sample Results:

LOCATION:	1	2	3	4	5	6	7	8	9	10
Nuclide 1										
Nuclide 2										
Nuclide 3										
Nuclide 4										

Note: All wipe sample results are in units of DPM / 100 sq. cm.

Comments:

No RAM Use

ESI Form HPS.1 Rev 1.0 1/92

ECOLOGY SERVICES, INC.
300 Second St., Laurel, Maryland 20707
(301) 498-1514

Company Name: FDA

RADIATION SAFETY SURVEY

Building / Room: MOD 1 / G414

Authorized Investigator: NAME:

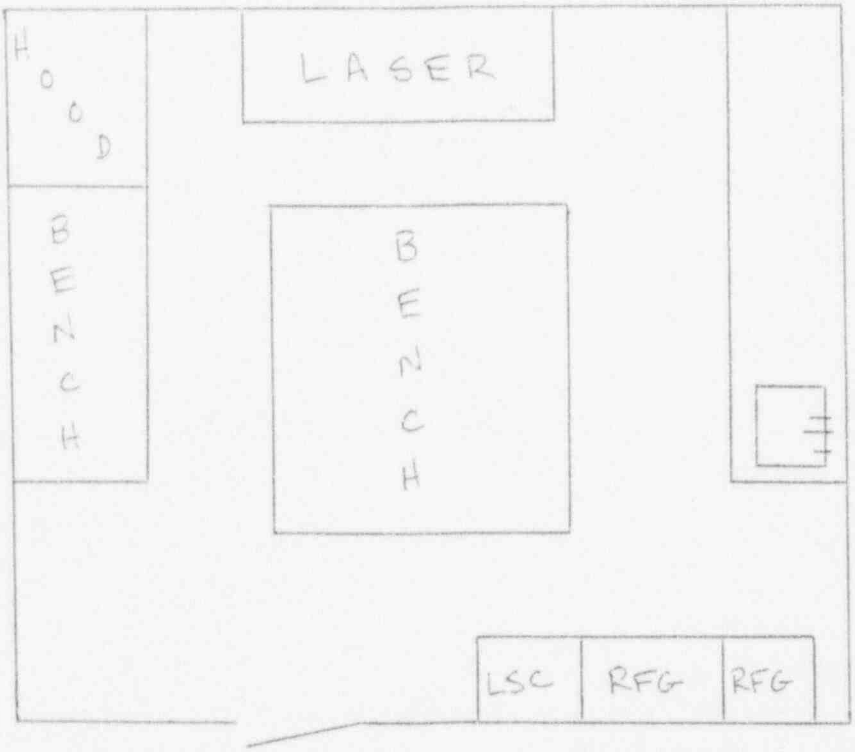
Phone No.

Date: 5-15-92

Surveyor: NAME: WATTS, C

Phone No.

Survey Meter Used



Compliance Items: Y - Compliance

Y N — 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
- ☐ ☐ Adequate use of Shielding
- ☐ ☐ Prohibition of eating, drinking, etc.
- ☐ ☐ Inventory & Disposal Records
- ☐ ☐ Survey Records Current
- ☐ ☐ Personnel Trained
- ☐ ☐ Prohibition on Mouth Pipetting
- ☐ ☐ Radiation Levels
- ☐ ☐ Contamination (Wipes) < 100 DPM/100 sq. cm.

Survey Instrument:

- ☐ ☐ Calibration Current
- ☐ ☐ Operational
- ☐ ☐ Available
- ☐ ☐ Other (Specify in Comments)

Wipe Sample Results:

LOCATION:	1	2	3	4	5	6	7	8	9	10
Nuclide 1										
Nuclide 2										
Nuclide 3										
Nuclide 4										

Note: All wipe sample results are in units of DPM / 100 sq. cm.

Comments:

No RAM Use

ECOLOGY SERVICES, INC.
300 Second St., Laurel, Maryland 20707
(301) 498-1514

Company Name: FDA

RADIATION SAFETY SURVEY

Building / Room: MOD 1 / G402

Authorized Investigator: NAME:

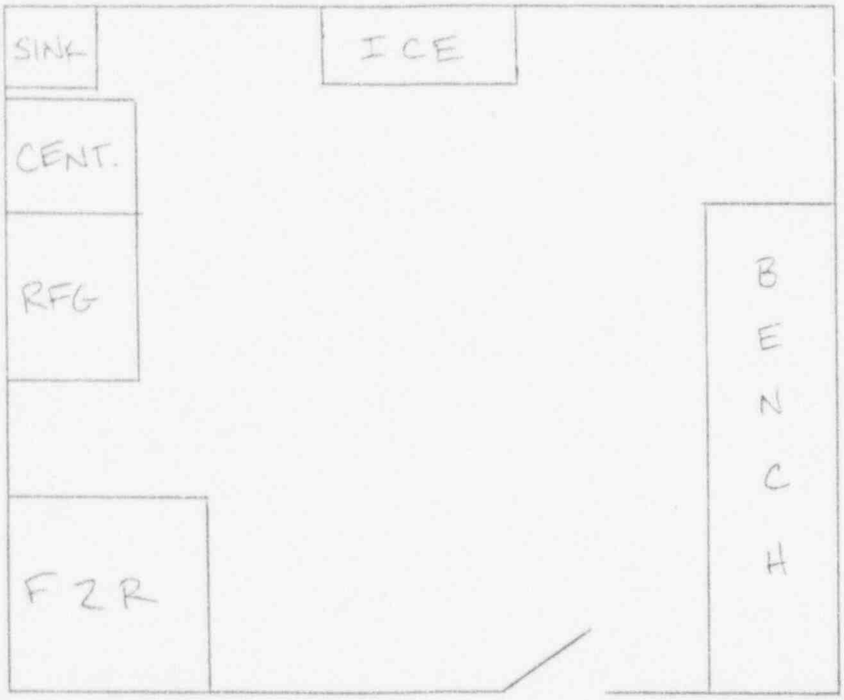
Phone No.

Date: 5.13-92

Surveyor: NAME: Watts C

Phone No.

Survey Meter Used



Compliance Items: Y - Compliance
Y N 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
- ☐ ☐ Adequate use of Shielding
- ☐ ☐ Prohibition of eating, drinking, etc.
- ☐ ☐ Inventory & Disposal Records
- ☐ ☐ Survey Records Current
- ☐ ☐ Personnel Trained
- ☐ ☐ Prohibition on Mouth Pipetting
- ☐ ☐ Radiation Levels
- ☐ ☐ Contamination (Wipes) < 100 DPM/100 sq. cm.

Survey Instrument:

- ☐ ☐ Calibration Current
- ☐ ☐ Operational
- ☐ ☐ Available
- ☐ ☐ Other (Specify in Comments)

Wipe Sample Results:

LOCATION:	1	2	3	4	5	6	7	8	9	10
Nuclide 1										
Nuclide 2										
Nuclide 3										
Nuclide 4										

Note: All wipe sample results are in units of DPM / 100 sq. cm.

Comments:

No RAM Use

ESI Form HPS.1 Rev 1.0 1/92

ECOLOGY SERVICES, INC.
300 Second St., Laurel, Maryland 20707
(301) 498-1514

Company Name: FDA

RADIATION SAFETY SURVEY

Building / Room: MOD 1 / 3404

Authorized Investigator: NAME:

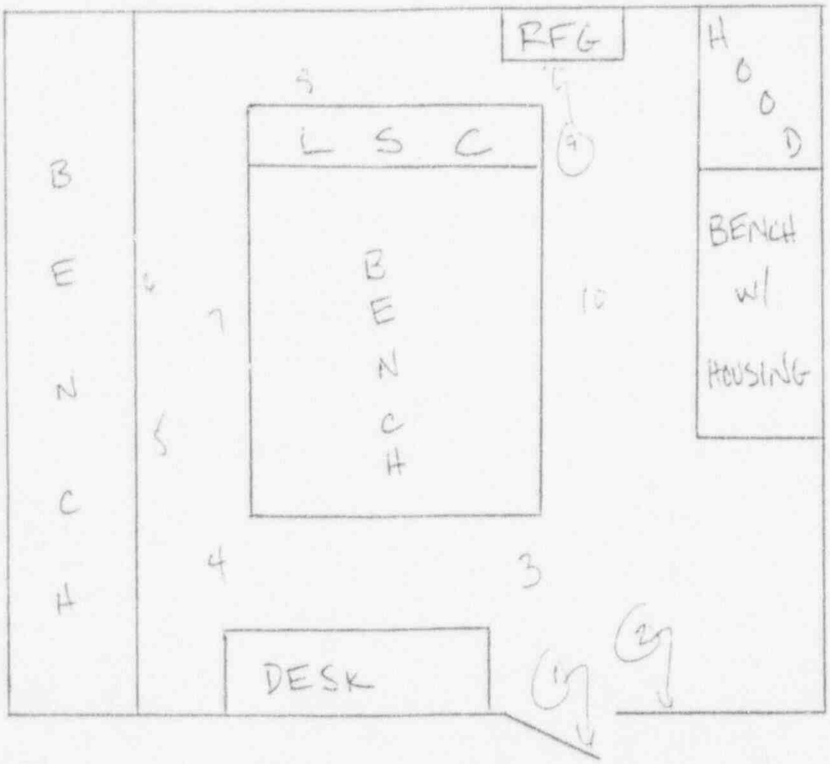
Phone No.

Date: 8-19-92

Surveyor: NAME: WATTS, C

Phone No.

Survey Meter Used: 13644-9



Wipe Sample Results:

LOCATION:	1	2	3	4	5	6	7	8	9	10
Nuclide 1 P	<10									→
Nuclide 2										
Nuclide 3										
Nuclide 4										

Note: All wipe sample results are in units of DPM / 100 sq. cm.

Comments:

Compliance Items: Y - Compliance

Y N

☐ ☐ 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
- ☑ ☐ Adequate use of Shielding
- ☑ ☐ Prohibition of eating, drinking, etc.
- ☑ ☐ Inventory & Disposal Records
- ☑ ☐ Survey Records Current
- ☑ ☐ Personnel Trained
- ☑ ☐ Prohibition on Mouth Pipetting
- ☑ ☐ Radiation Levels
- ☐ ☐ Contamination (Wipes) < 100 DPM/100 sq. cm.

Survey Instrument:

- ☐ ☐ Calibration Current
- ☐ ☐ Operational
- ☐ ☐ Available
- ☐ ☐ Other (Specify in Comments)

ESI Form HPS.1 Rev 1.0 1/92

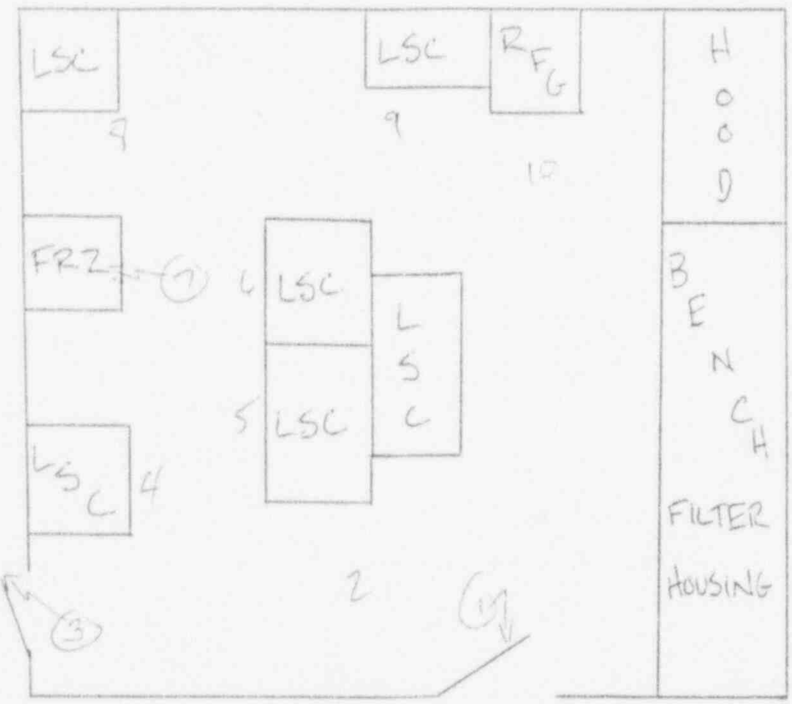
ECOLOGY SERVICES, INC.
300 Second St., Laurel, Maryland 20707
(301) 498-1514

Company Name: FDA

RADIATION SAFETY SURVEY

Building / Room: MOD 1 / 2313

Authorized Investigator:	NAME:	Phone No.	Date: 5-18-92
Surveyor:	NAME: WATTS, C	Phone No.	Survey Meter Used L3 w/44-9



Compliance Items: Y - Compliance
N - Non-Compliance
Blank - Not Evaluated
Y N
☐ ☐

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, etc.
- ☑ ☐ Inventory & Disposal Records
- ☑ ☐ Survey Records Current
- ☑ ☐ Personnel Trained
- ☑ ☐ Prohibition on Mouth Pipetting
- ☑ ☐ Radiation Levels
- ☑ ☐ Contamination (Wipes) < 100 DPM/100 sq. cm.

Survey Instrument:

- ☐ ☐ Calibration Current
- ☐ ☐ Operational
- ☐ ☐ Available
- ☐ ☐ Other (Specify in Comments)

Wipe Sample Results:

LOCATION:		1	2	3	4	5	6	7	8	9	10
Nuclide 1	P	<100									→
Nuclide 2											
Nuclide 3											
Nuclide 4											

Note: All wipe sample results are in units of DPM / 100 sq. cm.

Comments:

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ECOLOGY SERVICES, INC.
300 Second St., Laurel, Maryland 20707
(301) 498-1514

Company Name: FDA

RADIATION SAFETY SURVEY

Building / Room: MOD 1 / 2315

Authorized Investigator: NAME:

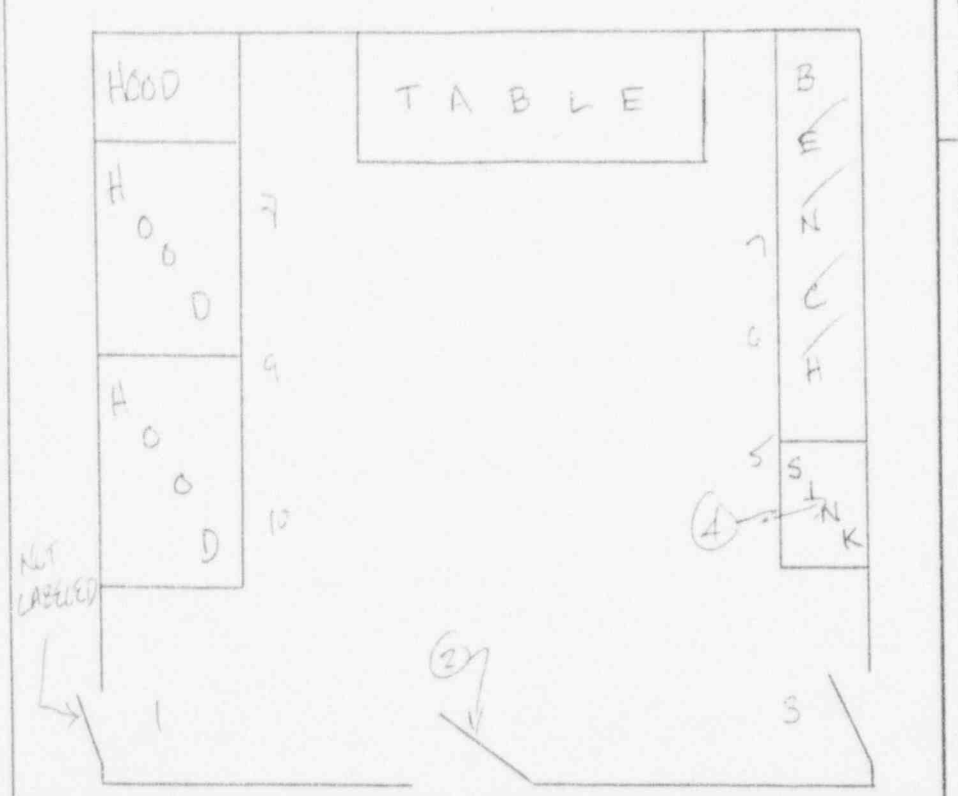
Phone No.

Date: 8-18-92

Surveyor: NAME: WATTS, C

Phone No.

Survey Meter Used: L3 - 4119



Wipe Sample Results:

LOCATION:	1	2	3	4	5	6	7	8	9	10
Nuclide 1 P	<dB	→								→
Nuclide 2										
Nuclide 3										
Nuclide 4										

Note: All wipe sample results are in units of DPM / 100 sq. cm.

Comments:

ENTRANCE NOT POSTED w/ CRM SIGN

Compliance Items: Y - Compliance
N - Non-Compliance
Blank - Not Evaluated

Y N
☐ ☐

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, etc.
☑ ☐ Inventory & Disposal Records
☑ ☐ Survey Records Current
☑ ☐ Personnel Trained
☑ ☐ Prohibition on Mouth Pipetting
☑ ☐ Radiation Levels
☐ ☐ Contamination (Wipes) < 100 DPM/100 sq. cm.

Survey Instrument:
☐ ☐ Calibration Current
☐ ☐ Operational
☐ ☐ Available
☐ ☐ Other (Specify in Comments)

ESI Form HPS 1 Rev 1.0 1/92

ECOLOGY SERVICES, INC.
300 Second St., Laurel, Maryland 20707
(301) 498-1514

Company Name: FDA

RADIATION SAFETY SURVEY

Building / Room: MOD 1 / 2321

Authorized Investigator: NAME:

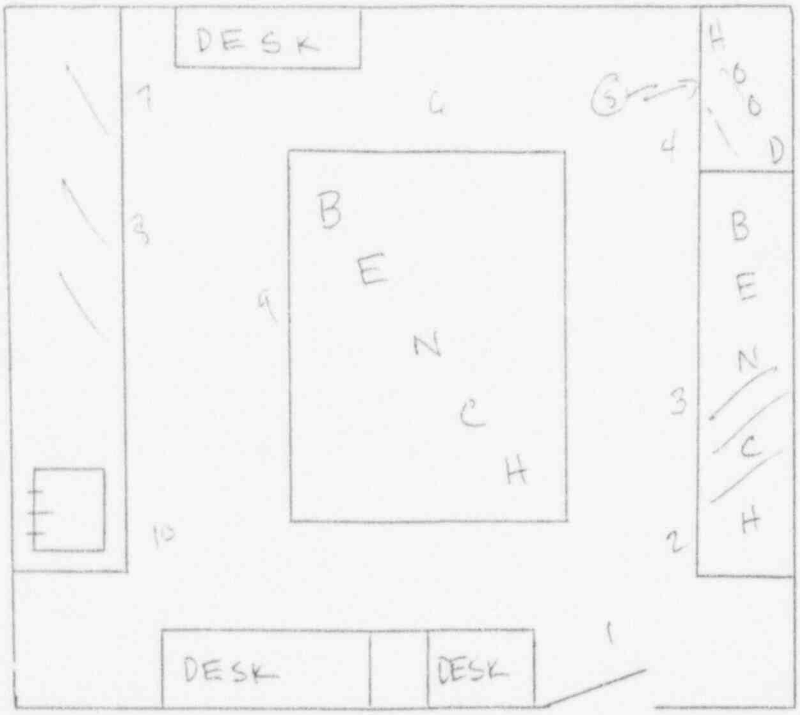
Phone No.

Date: 8-18-92

Surveyor: NAME: WATB, C

Phone No.

Survey Meter Used: L3 w/44-9



Wipe Sample Results:

LOCATION:	1	2	3	4	5	6	7	8	9	10
Nuclide 1 ?	<100	→	→	→	→	→	→	→	→	→
Nuclide 2										
Nuclide 3										
Nuclide 4										

Note: All wipe sample results are in units of DPM / 100 sq. cm.

Comments:

Compliance Items: Y - Compliance
Y N
☐ ☐ 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
- ☑ ☐ Adequate use of Shielding
- ☑ ☐ Prohibition of eating, drinking, etc.
- ☑ ☐ Inventory & Disposal Records
- ☑ ☐ Survey Records Current
- ☑ ☐ Personnel Trained
- ☑ ☐ Prohibition on Mouth Pipetting
- ☑ ☐ Radiation Levels
- ☑ ☐ Contamination (Wipes) < 100 DPM/100 sq. cm.

Survey Instrument:
- ☐ ☐ Calibration Current
- ☐ ☐ Operational
- ☐ ☐ Available
- ☐ ☐ Other (Specify in Comments)

ESI Form HPS-1 Rev 1/0 1/92

ECOLOGY SERVICES, INC.
300 Second St., Laurel, Maryland 20707
(301) 498-1514

Company Name: FDA

RADIATION SAFETY SURVEY

Building / Room: MOD 1 / WASTE

Authorized Investigator: NAME:

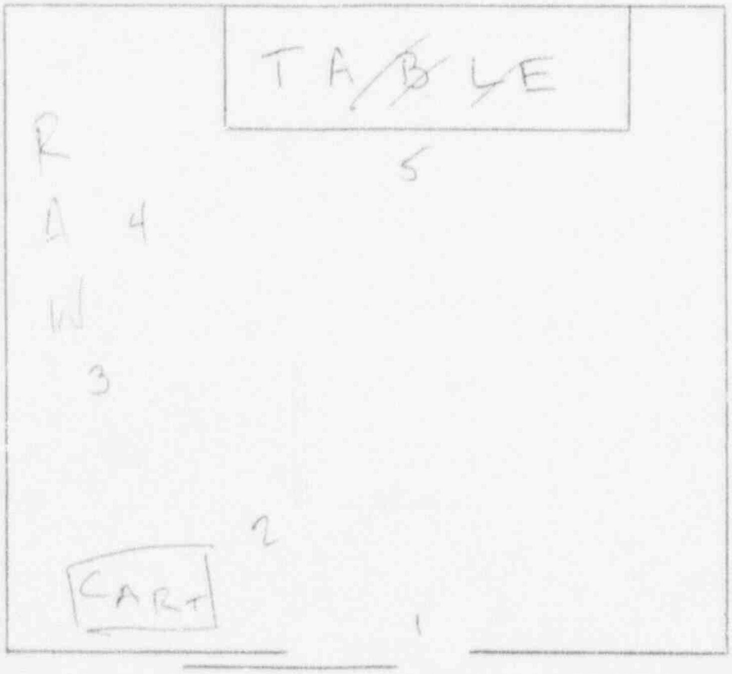
Phone No.

Date: 8-18-92

Surveyor: NAME: WATTS, C

Phone No.

Survey Meter Used: L3 w/ 44-9



Compliance Items: Y - Compliance
N - Non-Compliance
Blank - Not Evaluated

Y N
☐ ☐

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, etc.
☑ ☐ Inventory & Disposal Records
☑ ☐ Survey Records Current
☑ ☐ Personnel Trained
☑ ☐ Prohibition on Mouth Pipetting
☑ ☐ Radiation Levels
☑ ☐ Contamination (Wipes) < 100 DPM/100 sq. cm.

Survey Instrument:

☐ ☐ Calibration Current
☐ ☐ Operational
☐ ☐ Available
☐ ☐ Other (Specify in Comments)

Wipe Sample Results:

LOCATION:		1	2	3	4	5	6	7	8	9	10
Nuclide 1	P	<100	→	→	→	→					
Nuclide 2											
Nuclide 3											
Nuclide 4											

Note: All wipe sample results are in units of DPM / 100 sq. cm.

Comments:

ESI Form HPS.1 Rev 1.0 1/92

ECOLOGY SERVICES, INC.

RADIATION SAFETY SURVEY

COMPANY NAME FDA

BLDG FB8

ROOM NO. 6034

AUTHORIZED INVESTIGATOR	NAME (last, first initial) CFSAN, SAFETY OFFICE	PHONE NO.	DATE (month, day, year) 7-9-92
SURVEYOR	NAME (last, first initial) KECK G	PHONE NO. 498-1514	SURVEY METER USED L12 w/43-68

COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
		(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 coats
		(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
▨	▨	(21) Corridor storage meets requirements
		(22) Radiation levels < 2.5 mR/hr
▨	▨	(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

METER 1	METER 2	METER 3

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1	<100 DPM	———	———	———	———	———	———	———	———	→
NUCLIDE 2										
NUCLIDE 3										

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

CO

CLOSEOUT

Rev. Oct 1990

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

ECOLOGY SERVICES, INC.
Data Processing

REPORT OF SAMPLE ANALYSIS

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

DATE: 07-10-92 BY: ELW

NR	SAMPLE ID	GROSS CT	CT TIME	EFF	DPM	UCI
1	#1	36	1.00	0.29	< MDA	< MDA
2	#2	35	1.00	0.27	< MDA	< MDA
3	#3	31	1.00	0.28	< MDA	< MDA
4	#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	< MDA
7	#7	36	1.00	0.28	< MDA	< MDA
8	#8	30	1.00	0.28	< MDA	< MDA
9	#9	29	1.00	0.27	< MDA	< MDA
10	#10	30	1.00	0.29	< MDA	< MDA
11	#11	31	1.00	0.29	< MDA	< MDA
12	#12	40	1.00	0.29	< MDA	< MDA
13	#13	32	1.00	0.29	< MDA	< MDA
14	#14	22	1.00	0.29	< MDA	< MDA
15	#15	28	1.00	0.28	< MDA	< MDA
16	#16	30	1.00	0.29	< MDA	< MDA
17	#17	27	1.00	0.27	< MDA	< MDA
18	#18	40	1.00	0.28	< MDA	< MDA
19	#19	35	1.00	0.29	< MDA	< MDA
20	#20	27	1.00	0.28	< MDA	< MDA

****

COUNTER: Beckman Model LS 100C DETECTOR: LSC

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

HEALTH PHYSICIST ____________________

ECOLOGY SERVICES, INC.
Data Processing

REPORT OF SAMPLE ANALYSIS

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

DATE: 07-10-92   BY: ELW

NR	SAMPLE ID	GROSS CT	CT TIME	EFF	DPM	UCI
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

BACKGROUND DATA: 45.00 (+- 29.2%) CPM

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

HEALTH PHYSICIST ____________________________

ECOLOGY SERVICES, INC.
300 Second St., Laurel, Maryland 20707
(301) 498-1514

Company Name: FDA

RADIATION SAFETY SURVEY

Building / Room: FB-8 / 1810

Authorized Investigator: NAME:

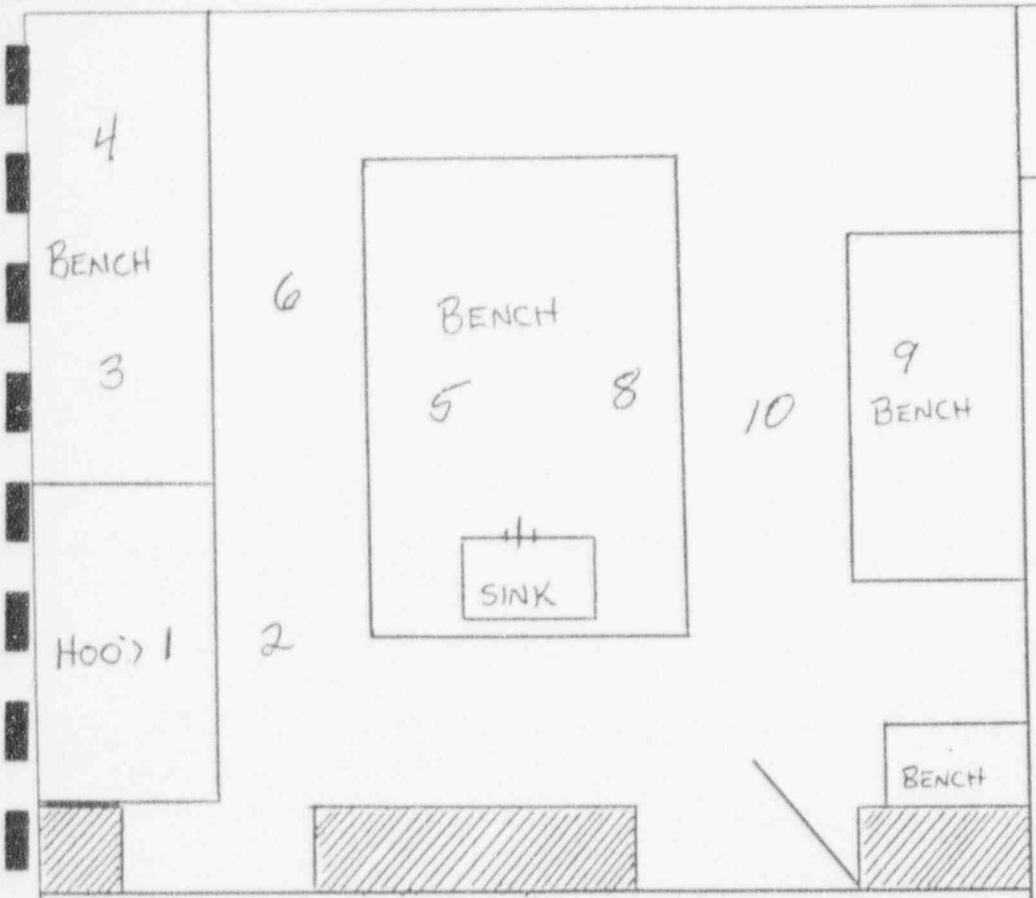
Phone No.

Date: 7-9-92

Surveyor: NAME: KECK, G

Phone No. 498-1514

Survey Meter Used: L12 w/43-68 ~~[illegible]~~



Compliance Items: Y - Compliance

Y N
☐ ☐

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
- ☐ ☐ Adequate use of Shielding
- ☐ ☐ Prohibition of eating, drinking, etc.
- ☐ ☐ Inventory & Disposal Records
- ☐ ☐ Survey Records Current
- ☐ ☐ Personnel Trained
- ☐ ☐ Prohibition on Mouth Pipetting
- ☐ ☐ Radiation Levels
- ☐ ☐ Contamination (Wipes) < 100 DPM/100 sq. cm.

Survey Instrument:

- ☐ ☐ Calibration Current
- ☐ ☐ Operational
- ☐ ☐ Available
- ☐ ☐ Other (Specify in Comments)

Wipe Sample Results:

LOCATION:	1	2	3	4	5	6	7	8	9	10
Nuclide 1	ALL <100 DPM									→
Nuclide 2										
Nuclide 3										
Nuclide 4										

Note: All wipe sample results are in units of DPM / 100 sq. cm.

Comments:

REGULAR SURVEY PERFORMED ON UNOCCUPIED ROOM. (Not a closeout)

ESI Form HPS.1 Rev 1.0 1/92

ECOLOGY SERVICES, INC.
300 Second St., Laurel, Maryland 20707
(301) 498-1514

Company Name: FDA

RADIATION SAFETY SURVEY

Building / Room: FB-8 / 1856

Authorized Investigator: NAME:

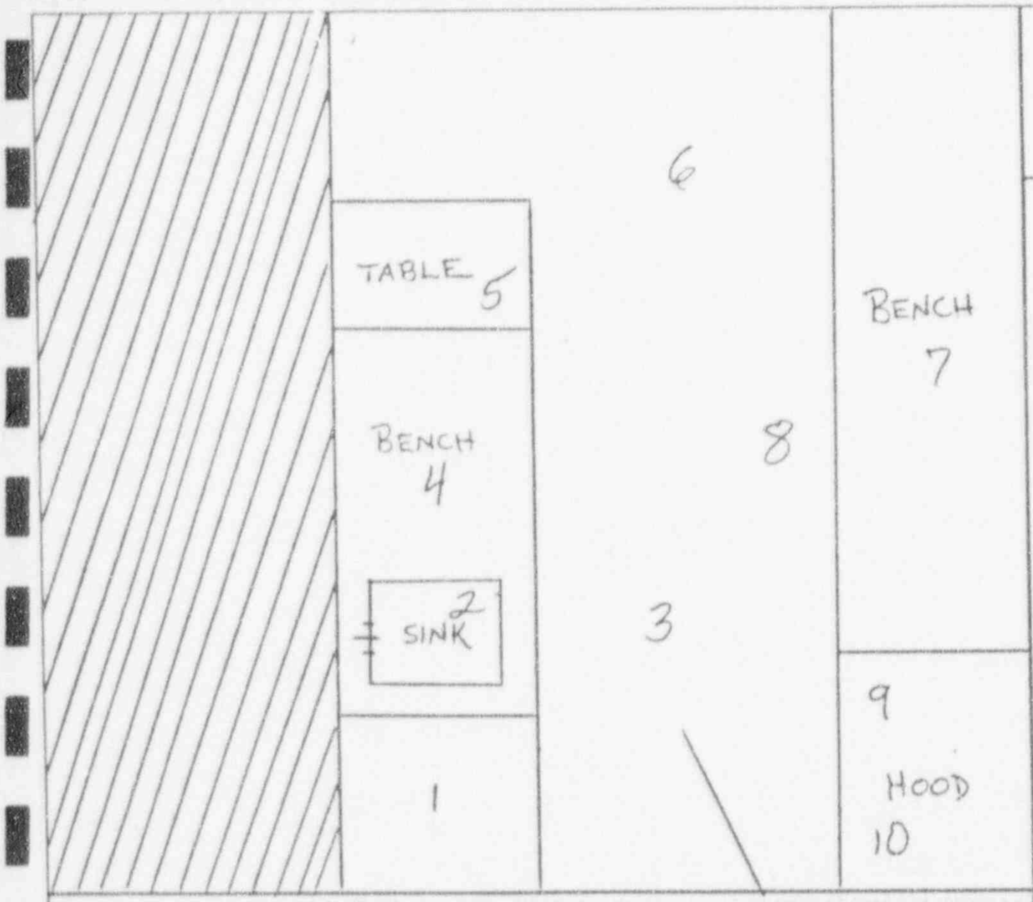
Phone No.

Date: 7-9-92

Surveyor: NAME: KECK, G

Phone No. 498-1514

Survey Meter Used L12 w/43-68



Compliance Items: Y - Compliance

Y N
☐ ☐

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
- ☐ ☐ Adequate use of Shielding
- ☐ ☐ Prohibition of eating, drinking, etc.
- ☐ ☐ Inventory & Disposal Records
- ☐ ☐ Survey Records Current
- ☐ ☐ Personnel Trained
- ☐ ☐ Prohibition on Mouth Pipetting
- ☐ ☐ Radiation Levels
- ☐ ☐ Contamination (Wipes) < 100 DPM/100 sq. cm.

Survey Instrument:

- ☐ ☐ Calibration Current
- ☐ ☐ Operational
- ☐ ☐ Available
- ☐ ☐ Other (Specify in Comments)

Wipe Sample Results:

LOCATION:	1	2	3	4	5	6	7	8	9	10
Nuclide 1	<100 DPM	———	———	———	———	———	———	———	———	→
Nuclide 2										
Nuclide 3										
Nuclide 4										

Note: All wipe sample results are in units of DPM / 100 sq. cm.

Comments:

REGULAR SURVEY PERFORMED ON UNOCCUPIED ROOM. (Not a closeout)

ESI Form HPS.1 Rev 1.0 1/92

ECOLOGY SERVICES, INC.
300 Second St., Laurel, Maryland 20707
(301) 498-1514

Company Name: FDA

RADIATION SAFETY SURVEY

Building / Room: FB-8 / 1838

Authorized Investigator: NAME:

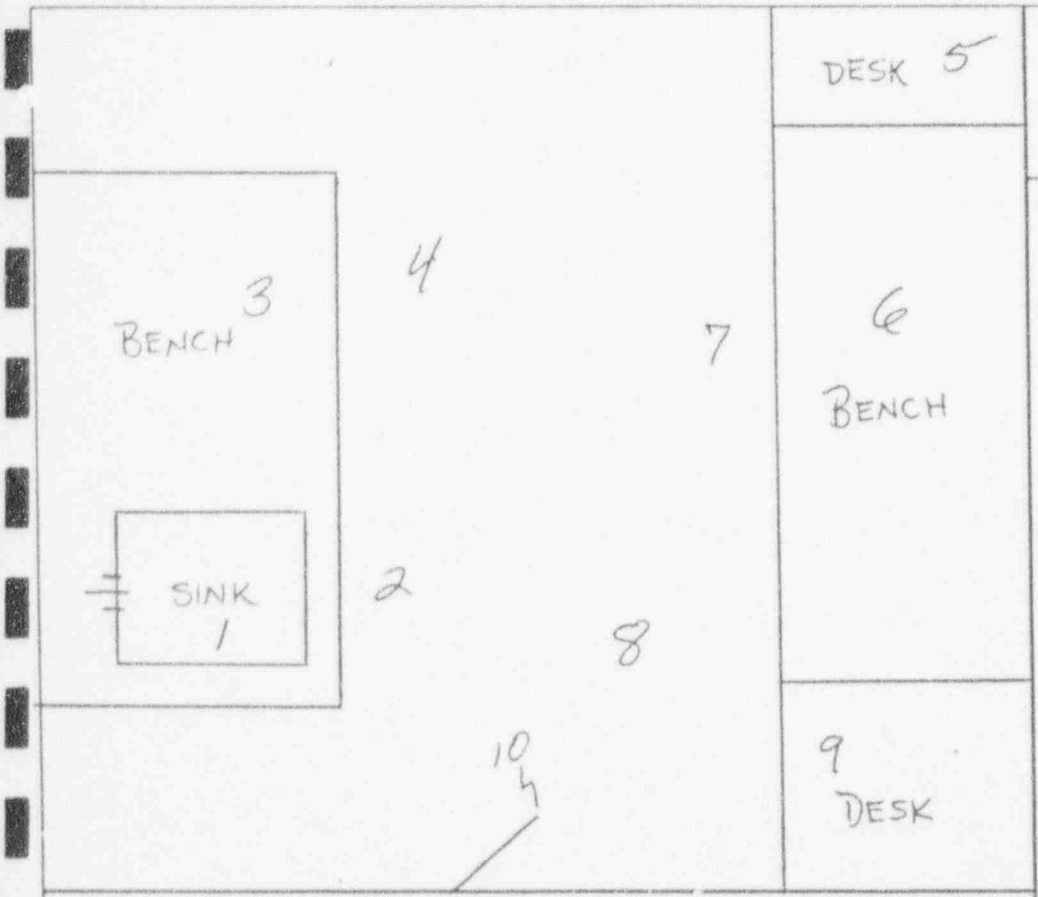
Phone No.:

Date: 7-9-92

Surveyor: NAME: KECK, G

Phone No.: 498-1514

Survey Meter Used: 212 w/43-68



Compliance Items: Y - Compliance
N - Non-Compliance
Blank - Not Evaluated

Y N
☐ ☐

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, etc.
- ☐ ☐ Inventory & Disposal Records
- ☐ ☐ Survey Records Current
- ☐ ☐ Personnel Trained
- ☐ ☐ Prohibition on Mouth Pipetting
- ☐ ☐ Radiation Levels
- ☐ ☐ Contamination (Wipes) < 100 DPM/100 sq. cm.

Survey Instrument:

- ☐ ☐ Calibration Current
- ☐ ☐ Operational
- ☐ ☐ Available
- ☐ ☐ Other (Specify in Comments)

Wipe Sample Results:

LOCATION:	1	2	3	4	5	6	7	8	9	10
Nuclide 1	<100 DPM →									
Nuclide 2										
Nuclide 3										
Nuclide 4										

Note: All wipe sample results are in units of DPM / 100 sq. cm.

Comments: REGULAR SURVEY PERFORMED ON UNOCCUPIED ROOM. (Not a closeout)

ESI Form HPS.1 Rev 1.0 1/92

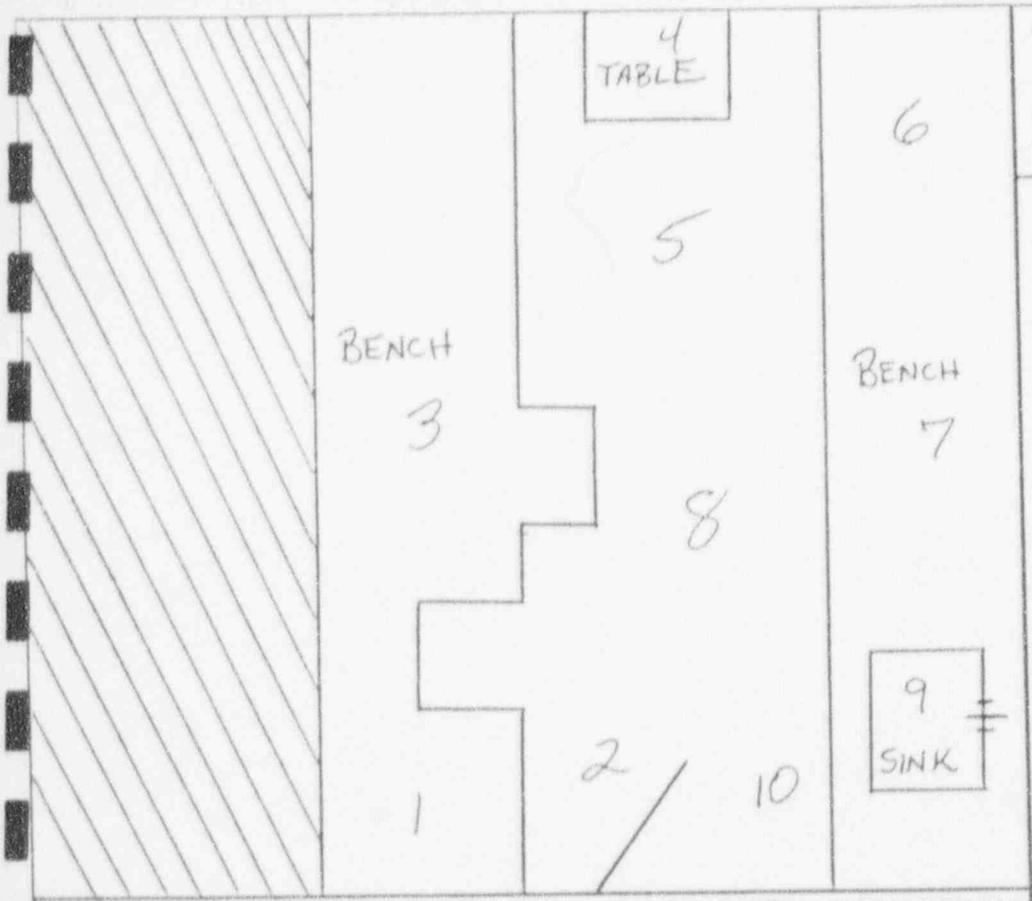
ECOLOGY SERVICES, INC.
300 Second St., Laurel, Maryland 20707
(301) 498-1514

Company Name: FDA

RADIATION SAFETY SURVEY

Building / Room: FB-8 / 1867

Authorized Investigator:	NAME:	Phone No.	Date: 7-9-92
Surveyor:	NAME: KECK, G	Phone No. 498-1514	Survey Meter Used: L12 W/43-68



Compliance Items: Y - Compliance
N - Non-Compliance
Blank - Not Evaluated

Y N
☐ ☐

Compliance Items:

Y	N	
☐	☐	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, etc.
☐	☐	Inventory & Disposal Records
☐	☐	Survey Records Current
☐	☐	Personnel Trained
☐	☐	Prohibition on Mouth Pipetting
☐	☐	Radiation Levels
☐	☐	Contamination (Wipes) < 100 DPM/100 sq. cm

Survey Instrument:

Y	N	
☐	☐	Calibration Current
☐	☐	Operational
☐	☐	Available
☐	☐	Other (Specify in Comments)

Wipe Sample Results:

LOCATION:	1	2	3	4	5	6	7	8	9	10
Nuclide 1	<100 DPM		—	—	—	—	—	—	—	→
Nuclide 2										
Nuclide 3										
Nuclide 4										

Note: All wipe sample results are in units of DPM / 100 sq. cm.

Comments:
REGULAR SURVEY PERFORMED ON UNOCCUPIED ROOM (Not a Closeout)

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ECOLOGY SERVICES, INC.
300 Second St., Laurel, Maryland 20707
(301) 498-1514

Company Name: FDA

RADIATION SAFETY SURVEY

Building / Room: FB-8 / 1866

Authorized Investigator: NAME:

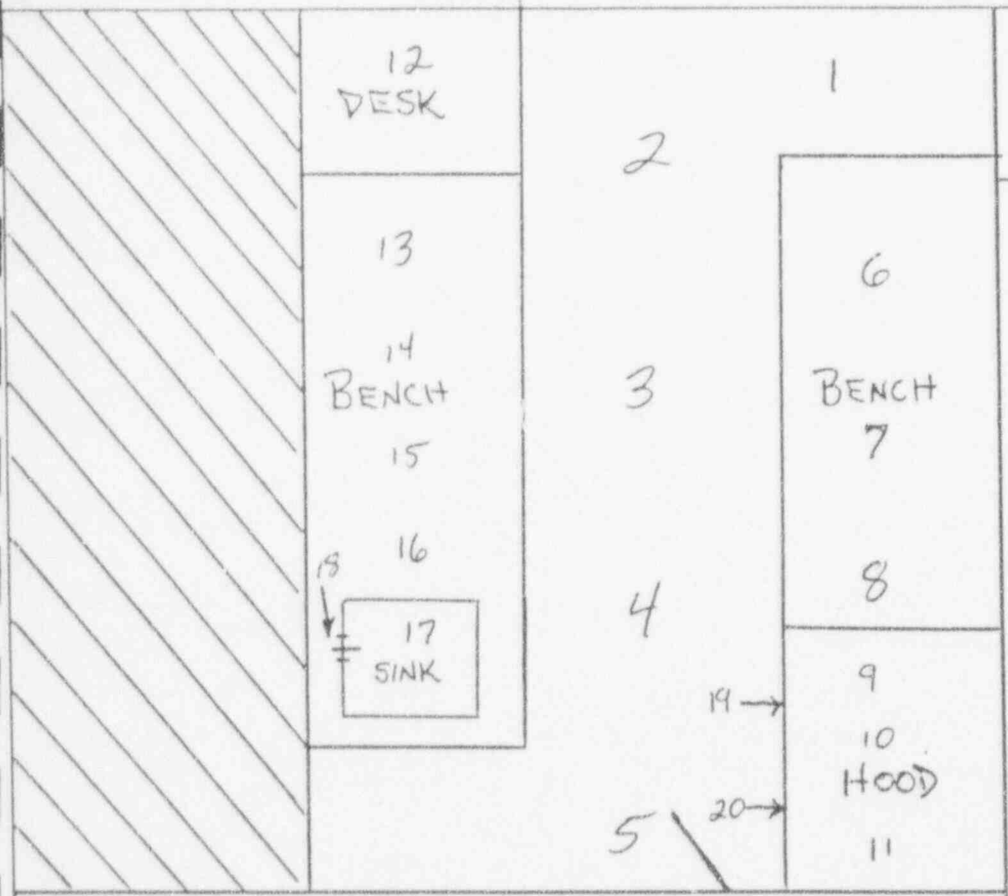
Phone No.

Date: 7-9-92

Surveyor: NAME: KECK, G

Phone No. 498-1514

Survey Meter Used L12 w/43-68



Compliance Items: Y - Compliance

Y N
☐ ☐ 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
- ☐ ☐ Adequate use of Shielding
- ☐ ☐ Prohibition of eating, drinking, etc.
- ☐ ☐ Inventory & Disposal Records
- ☐ ☐ Survey Records Current
- ☐ ☐ Personnel Trained
- ☐ ☐ Prohibition on Mouth Pipetting
- ☐ ☐ Radiation Levels
- ☐ ☐ Contamination (Wipes) < 100 DPM/100 sq. cm.

Survey Instrument:

- ☐ ☐ Calibration Current
- ☐ ☐ Operational
- ☐ ☐ Available
- ☐ ☐ Other (Specify in Comments)

Wipe Sample Results:

LOCATION:	1	2	3	4	5	6	7	8	9	10
Nuclide 1	ALL <100 DPM									→
Nuclide 2										
Nuclide 3										
Nuclide 4										

Note: All wipe sample results are in units of DPM / 100 sq. cm.

Comments:

CLOSE OUT SURVEY

ESI Form HPS.1 Rev 1.0 1/92

ECOLOGY SERVICES, INC.
Data Processing

REPORT OF SAMPLE ANALYSIS

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	DPM	UCI
1	#1	45	1.00	0.28	< MDA	< MDA
2	#2	36	1.00	0.26	< MDA	< MDA
3	#3	48	1.00	0.29	< 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	< MDA	< MDA
10	#10	41	1.00	0.28	< MDA	< 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	38	1.00	0.30	< MDA	< MDA
15	#15	45	1.00	0.29	< 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

****

COUNTER: Beckman Model LS 100C DETECTOR: LSC

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

HEALTH PHYSICIST ____________________

ECOLOGY SERVICES, INC.
300 Second St., Laurel, Maryland 20707
(301) 498-1514

Company Name: FDA

F[illegible]DIATION SAFETY SURVEY

Building / Room: FB-8 / 1830

Authorized Investigator: NAME:

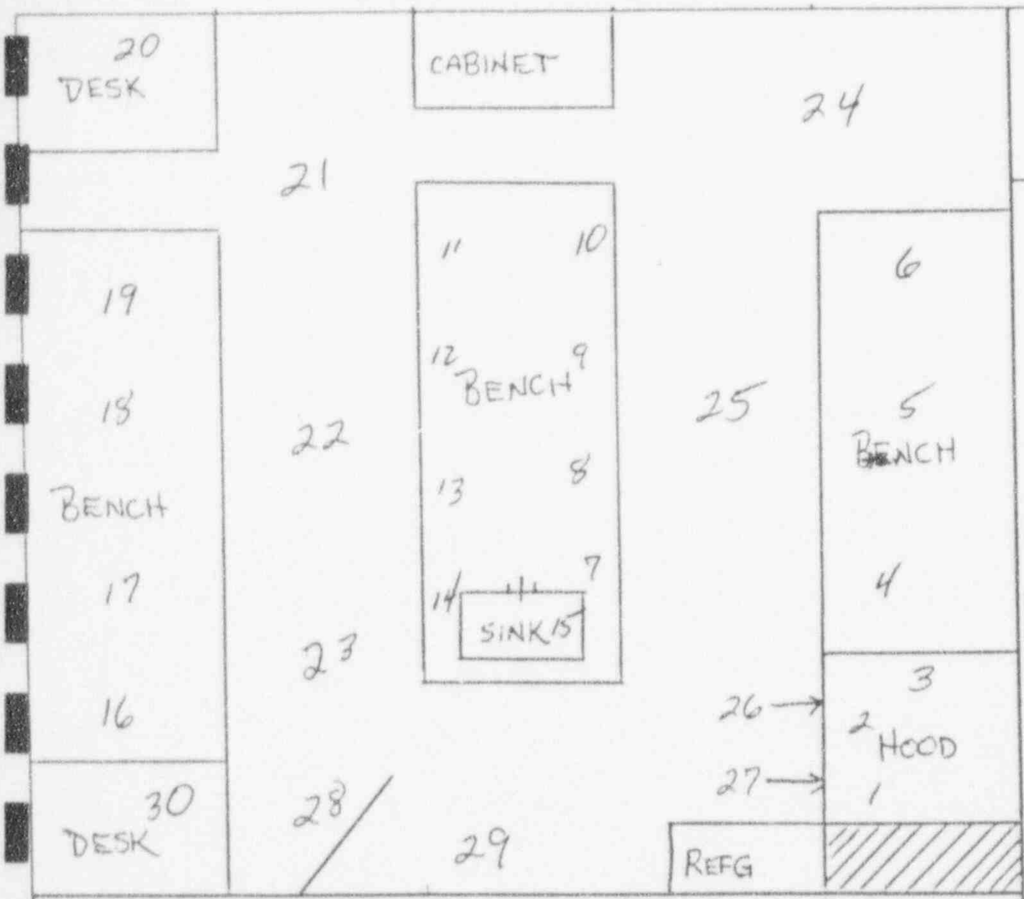
Phone No.

Date: 7-9-92

Surveyor: NAME: KECK, G

Phone No. 498-1514

Survey Meter Used L12 w/43-68 L3 w/44-3



Compliance Items: Y - Compliance
Y N
☐ ☐
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
- ☐ ☐ Adequate use of Shielding
- ☐ ☐ Prohibition of eating, drinking, etc.
- ☐ ☐ Inventory & Disposal Records
- ☐ ☐ Survey Records Current
- ☐ ☐ Personnel Trained
- ☐ ☐ Prohibition on Mouth Pipetting
- ☐ ☐ Radiation Levels
- ☐ ☐ Contamination (Wipes) < 100 DPM/100 sq. cm.

Survey Instrument:

- ☐ ☐ Calibration Current
- ☐ ☐ Operational
- ☐ ☐ Available
- ☐ ☐ Other (Specify in Comments)

Wipe Sample Results:

LOCATION:	1	2	3	4	5	6	7	8	9	10
Nuclide 1	ALL <100	DPM	⟶							
Nuclide 2										
Nuclide 3										
Nuclide 4										

Note: All wipe sample results are in units of DPM / 100 sq. cm.

Comments:

CLOSE OUT SURVEY

ESI Form HPS.1 Rev 1.0 1/92

ECOLOGY SERVICES, INC.
Data Processing

REPORT OF SAMPLE ANALYSIS

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

DATE: 07-13-92 BY: ELW

NR	SAMPLE ID	GROSS CT	CT TIME	EFF	DPM	UCI
1	#1	49	1.00	0.26	< MDA	< MDA
2	#2	27	1.00	0.28	< MDA	< MDA
3	#3	47	1.00	0.26	< MDA	< MDA
4	#4	38	1.00	0.29	< MDA	< MDA
5	#5	35	1.00	0.29	< MDA	< MDA
6	#6	36	1.00	0.29	< MDA	< MDA
7	#7	37	1.00	0.28	< MDA	< MDA
8	#8	23	1.00	0.30	< MDA	< MDA
9	#9	30	1.00	0.30	< MDA	< MDA
10	#10	46	1.00	0.28	< MDA	< MDA
11	#11	32	1.00	0.29	< MDA	< MDA
12	#12	40	1.00	0.30	< MDA	< MDA
13	#13	36	1.00	0.28	< MDA	< MDA
14	#14	38	1.00	0.28	< MDA	< MDA
15	#15	28	1.00	0.29	< MDA	< MDA
16	#16	41	1.00	0.29	< MDA	< MDA
17	#17	31	1.00	0.29	< MDA	< MDA
18	#18	41	1.00	0.28	< MDA	< MDA
19	#19	42	1.00	0.29	< MDA	< MDA
20	#20	41	1.00	0.28	< 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 DPM 4.79E-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 1830 SAMPLE TYPE: Gross Alpha/Beta

DATE: 07-13-92 BY: ELW

NR	SAMPLE ID	GROSS CT	CT TIME	EFF	DPM	UCI
1	#21	24	1.00	0.29	< MDA	< MDA
2	#22	40	1.00	0.29	< MDA	< MDA
3	#23	36	1.00	0.30	< MDA	< MDA
4	#24	37	1.00	0.29	< MDA	< MDA
5	#25	44	1.00	0.29	< MDA	< MDA
6	#26	33	1.00	0.27	< MDA	< MDA
7	#27	23	1.00	0.28	< MDA	< MDA
8	#28	34	1.00	0.29	< MDA	< MDA
9	#29	29	1.00	0.29	< MDA	< MDA
10	#30	29	1.00	0.28	< 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 DPM 4.79E-05 UCI

PRECISION OF MEASUREMENTS: 95% CONFIDENCE LEVEL

HEALTH PHYSICIST ____________________

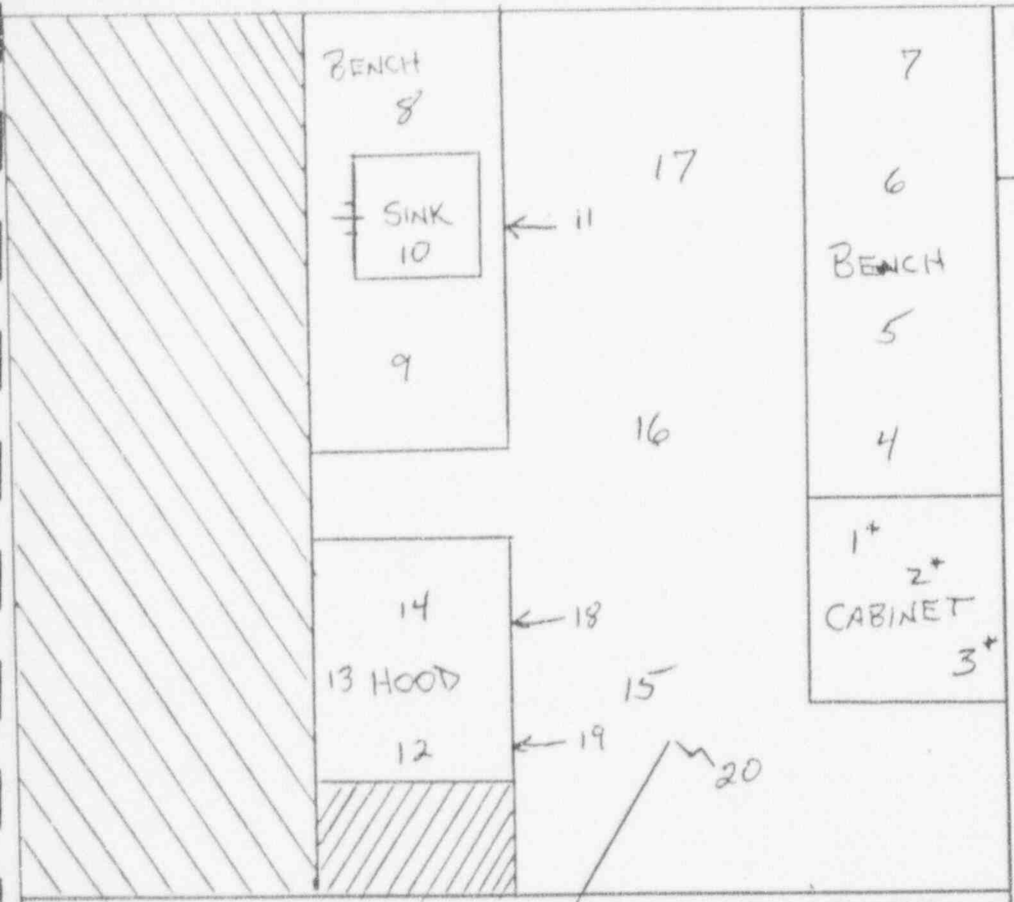
ECOLOGY SERVICES, INC.
300 Second St., Laurel, Maryland 20707
(301) 498-1514

Company Name: FDA

RADIATION SAFETY SURVEY

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 L12 w/43-68 L3 w/44-3



Compliance Items: Y - Compliance
Y N
☐ ☐ 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
- ☐ ☐ Adequate use of Shielding
- ☐ ☐ Prohibition of eating, drinking, etc.
- ☐ ☐ Inventory & Disposal Records
- ☐ ☐ Survey Records Current
- ☐ ☐ Personnel Trained
- ☐ ☐ Prohibition on Mouth Pipetting
- ☐ ☐ Radiation Levels
- ☐ ☐ Contamination (Wipes) < 100 DPM/100 sq. cm.

Survey Instrument:

- ☐ ☐ Calibration Current
- ☐ ☐ Operational
- ☐ ☐ Available
- ☐ ☐ Other (Specify in Comments)

Wipe Sample Results:

LOCATION:	1	2	3	4	5	6	7	8	9	10
Nuclide 1	ALL <100	DPM	→	→	→	→	→	→	→	→
Nuclide 2										
Nuclide 3										
Nuclide 4										

Note: All wipe sample results are in units of DPM / 100 sq. cm.

Comments:

CLOSEOUT SURVEY
* #1,2+3 ON CABINET SHELVES

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ECOLOGY SERVICES, INC.
Data Processing

REPORT OF SAMPLE ANALYSIS

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

DATE: 07-13-92 BY: ELW

NR	SAMPLE ID	GROSS CT	CT TIME	EFF	DPM	UCI
1	#1	29	1.00	0.30	< MDA	< MDA
2	#2	31	1.00	0.29	< MDA	< MDA
3	#3	47	1.00	0.29	< MDA	< MDA
4	#4	43	1.00	0.29	< MDA	< MDA
5	#5	43	1.00	0.30	< MDA	< MDA
6	#6	35	1.00	0.29	< MDA	< MDA
7	#7	45	1.00	0.26	< MDA	< MDA
8	#8	45	1.00	0.29	< MDA	< MDA
9	#9	32	1.00	0.28	< MDA	< MDA
10	#10	26	1.00	0.28	< MDA	< MDA
11	#11	35	1.00	0.29	< MDA	< MDA
12	#12	36	1.00	0.27	< MDA	< MDA
13	#13	49	1.00	0.25	< MDA	< MDA
14	#14	37	1.00	0.23	< MDA	< MDA
15	#15	33	1.00	0.30	< MDA	< MDA
16	#16	39	1.00	0.29	< MDA	< MDA
17	#17	38	1.00	0.30	< MDA	< MDA
18	#18	32	1.00	0.30	< MDA	< MDA
19	#19	39	1.00	0.29	< MDA	< MDA
20	#20	41	1.00	0.29	< MDA	< MDA

****

COUNTER: Beckman Model LS 100C DETECTOR: LSC

BACKGROUND DATA: 34.00 (+- 33.6%) CPM

EFFICIENCY DATA:

MEAN EFFICIENCY: 0.28+-(5.0%)

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

PRECISION OF MEASUREMENTS: 95% CONFIDENCE LEVEL

HEALTH PHYSICIST ______________________

ECOLOGY SERVICES, INC.
300 Second St., Laurel, Maryland 20707
(301) 498-1514

Company Name: FDA

RADIATION SAFETY SURVEY

Building / Room: FB-8 / 3046

Authorized Investigator: NAME:

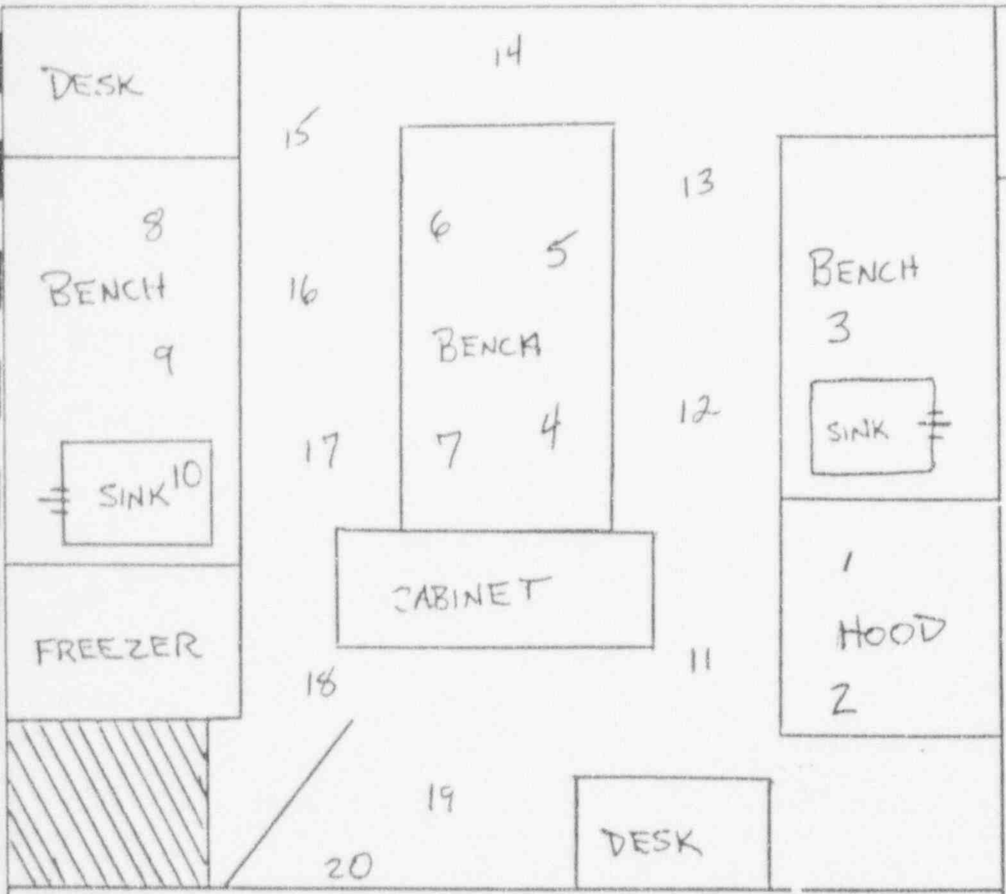
Phone No.

Date: 7/9/92

Surveyor: NAME: KECK, G

Phone No. 498-1514

Survey Meter Used L12 w/43-68



Wipe Sample Results:

LOCATION:	1 ALL	2	3	4	5	6	7	8	9	10
Nuclide 1	<100 DPM	→	→	→	→	→	→	→	→	→
Nuclide 2										
Nuclide 3										
Nuclide 4										

Note: All wipe sample results are in units of DPM / 100 sq. cm.

Compliance Items: Y - Compliance
Y N
☐ ☐
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
- ☐ ☐ Adequate use of Shielding
- ☐ ☐ Prohibition of eating, drinking, etc.
- ☐ ☐ Inventory & Disposal Records
- ☐ ☐ Survey Records Current
- ☐ ☐ Personnel Trained
- ☐ ☐ Prohibition on Mouth Pipetting
- ☐ ☐ Radiation Levels
- ☐ ☐ Contamination (Wipes) < 100 DPM/100 sq. cm.

Survey Instrument:

- ☐ ☐ Calibration Current
- ☐ ☐ Operational
- ☐ ☐ Available
- ☐ ☐ Other (Specify in Comments)

Comments:
Unable to perform a complete closeout.
Room is currently being used.

ECOLOGY SERVICES, INC.
Data Processing

REPORT OF SAMPLE ANALYSIS

FOR: FDA JOB: Bldg FB8 Room 3046 SAMPLE TYPE: Gross Alpha/Beta

DATE: 07-13-92   BY: ELW

NR	SAMPLE ID	GROSS CT	CT TIME	EFF	DPM	UCI
1	#1	40	1.00	0.29	< MDA	< MDA
2	#2	43	1.00	0.28	< MDA	< MDA
3	#3	39	1.00	0.30	< MDA	< MDA
4	#4	31	1.00	0.29	< MDA	< MDA
5	#5	38	1.00	0.29	< MDA	< MDA
6	#6	35	1.00	0.29	< MDA	< MDA
7	#7	41	1.00	0.29	< MDA	< MDA
8	#8	22	1.00	0.29	< MDA	< MDA
9	#9	29	1.00	0.29	< MDA	< MDA
10	#10	27	1.00	0.28	< MDA	< MDA
11	#11	32	1.00	0.29	< MDA	< MDA
12	#12	30	1.00	0.28	< MDA	< MDA
13	#13	38	1.00	0.30	< MDA	< MDA
14	#14	39	1.00	0.28	< MDA	< MDA
15	#15	40	1.00	0.27	< MDA	< MDA
16	#16	35	1.00	0.29	< MDA	< MDA
17	#17	29	1.00	0.28	< MDA	< MDA
18	#18	37	1.00	0.29	< MDA	< MDA
19	#19	45	1.00	0.29	< MDA	< MDA
20	#20	36	1.00	0.30	< MDA	< MDA

****

COUNTER: Beckman Model LS 100C   DETECTOR: LSC

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

HEALTH PHYSICIST ______________________

ECOLOGY SERVICES, INC.
300 Second St., Laurel, Maryland 20707
(301) 498-1514

Company Name: FDA

RADIATION SAFETY SURVEY

Building / Room: FB-8 / 3058

Authorized Investigator: NAME:

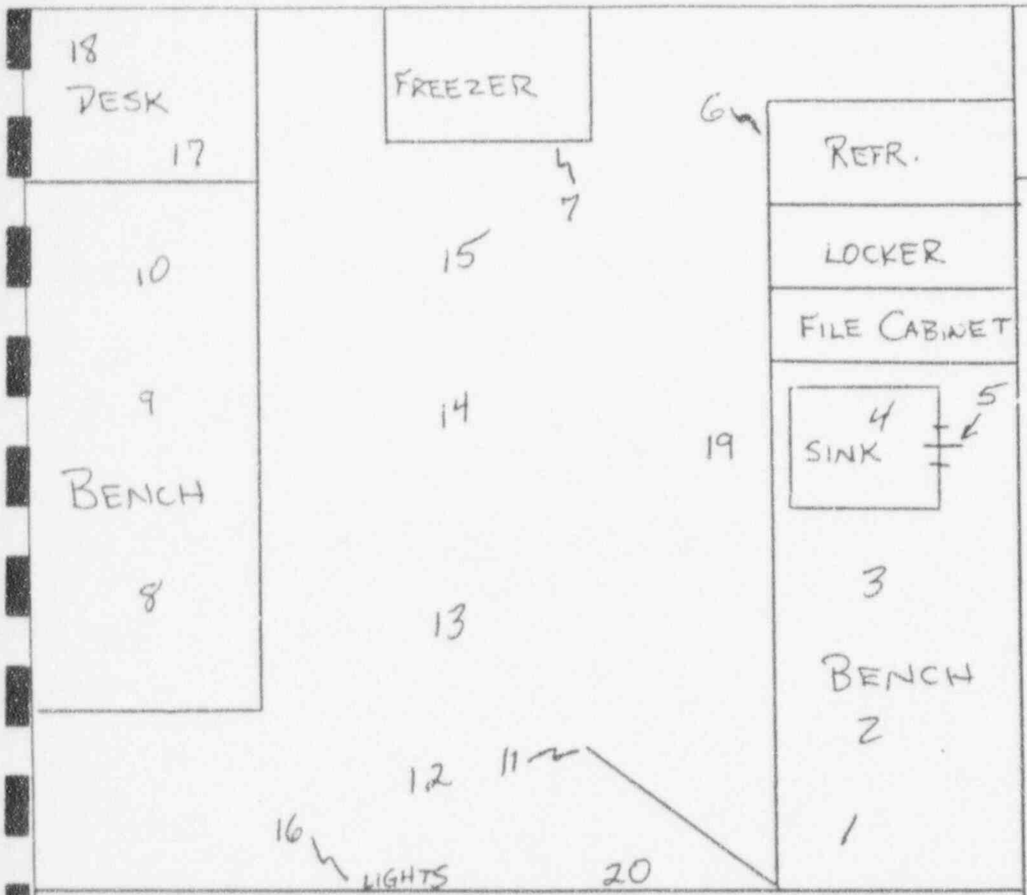
Phone No.:

Date: 7-9-92

Surveyor: NAME: KECK, G

Phone No.: 498-1514

Survey Meter Used: L12 4/43-68



Wipe Sample Results:

LOCATION:	1	2	3	4	5	6	7	8	9	10
Nuclide 1	ALL <100 DPM ⟶									
Nuclide 2										
Nuclide 3										
Nuclide 4										

Note: All wipe sample results are in units of DPM / 100 sq. cm.

Compliance Items: Y - Compliance
N - Non-Compliance
Blank - Not Evaluated

Y N
☐ ☐

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, etc.
- ☐ ☐ Inventory & Disposal Records
- ☐ ☐ Survey Records Current
- ☐ ☐ Personnel Trained
- ☐ ☐ Prohibition on Mouth Pipetting
- ☐ ☐ Radiation Levels
- ☐ ☐ Contamination (Wipes) < 100 DPM/100 sq. cm.

Survey Instrument:

- ☐ ☐ Calibration Current
- ☐ ☐ Operational
- ☐ ☐ Available
- ☐ ☐ Other (Specify in Comments)

Comments:
Unable to perform a complete closeout.
Room currently in use.

ESI Form HPS.1 Rev 1.0 1/92

ECOLOGY SERVICES, INC.
Data Processing
REPORT OF SAMPLE ANALYSIS

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

DATE: 07-13-92 BY: ELW

NR	SAMPLE ID	GROSS CT	CT TIME	EFF	DPM	UCI
1	#1	30	1.00	0.29	< MDA	< MDA
2	#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	#5	32	1.00	0.28	< MDA	< MDA
6	#6	37	1.00	0.28	< MDA	< MDA
7	#7	36	1.00	0.28	< MDA	< MDA
8	#8	45	1.00	0.29	< MDA	< MDA
9	#9	34	1.00	0.29	< MDA	< MDA
10	#10	46	1.00	0.29	< MDA	< MDA
11	#11	38	1.00	0.28	< MDA	< MDA
12	#12	29	1.00	0.28	< MDA	< MDA
13	#13	32	1.00	0.29	< MDA	< MDA
14	#14	28	1.00	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	< 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: LSC

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

HEALTH PHYSICIST ______________________

ECOLOGY SERVICES, INC.
300 Second St., Laurel, Maryland 20707
(301) 498-1514

Company Name: FDA

RADIATION SAFETY SURVEY

Building / Room: FB-8 / 6082 A

Authorized Investigator: NAME:

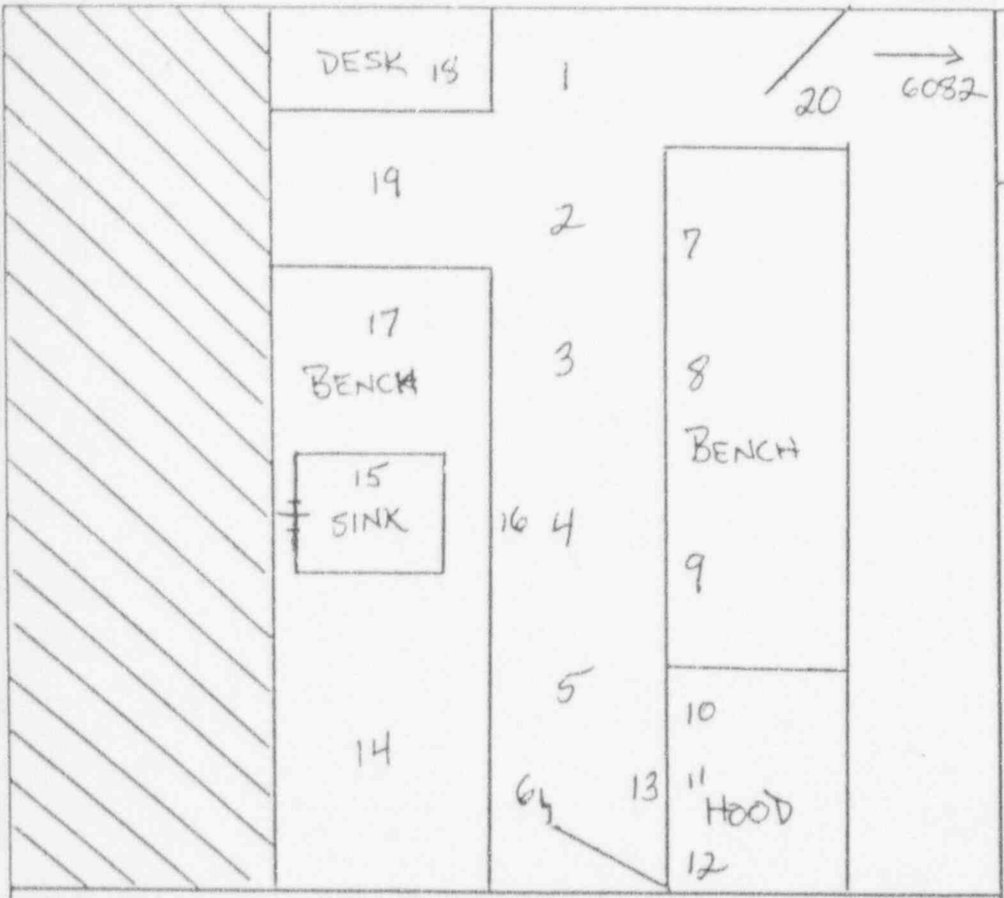
Phone No.

Date: 7-9-92

Surveyor: NAME: KECK, G

Phone No. 498-1514

Survey Meter Used
L12 W/43-68
L3 W/AC-3



Wipe Sample Results:

LOCATION:	1	2	3	4	5	6	7	8	9	10
Nuclide 1	ALL <100 DPM	→	→	→	→	→	→	→	→	→
Nuclide 2										
Nuclide 3										
Nuclide 4										

Note: All wipe sample results are in units of DPM / 100 sq. cm.

Compliance Items: Y - Compliance
N - Non-Compliance
Blank - Not Evaluated

Y N
☐ ☐

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, etc.
- ☐ ☐ Inventory & Disposal Records
- ☐ ☐ Survey Records Current
- ☐ ☐ Personnel Trained
- ☐ ☐ Prohibition on Mouth Pipetting
- ☐ ☐ Radiation Levels
- ☐ ☐ Contamination (Wipes) < 100 DPM/100 sq. cm.

Survey Instrument:

- ☐ ☐ Calibration Current
- ☐ ☐ Operational
- ☐ ☐ Available
- ☐ ☐ Other (Specify in Comments)

Comments:

Unable to perform a complete closeout. Room currently in use.

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ECOLOGY SERVICES, INC.
Data Processing
REPORT OF SAMPLE ANALYSIS

FOR: FDA JOB: Bldg FB8 Room 6082-A SAMPLE TYPE: Gross Alpha/Beta

DATE: 07-10-92 BY: ELW

NR	SAMPLE ID	GROSS CT	CT TIME	EFF	DPM	UCI
1	#1	39	1.00	0.27	< MDA	< MDA
2	#2	28	1.00	0.27	< MDA	< MDA
3	#3	37	1.00	0.29	< MDA	< MDA
4	#4	33	1.00	0.29	< MDA	< MDA
5	#5	26	1.00	0.28	< MDA	< MDA
6	#6	42	1.00	0.30	< MDA	< MDA
7	#7	23	1.00	0.29	< MDA	< MDA
8	#8	30	1.00	0.29	< MDA	< MDA
9	#9	27	1.00	0.29	< MDA	< MDA
10	#10	44	1.00	0.28	< MDA	< MDA
11	#11	44	1.00	0.28	< MDA	< MDA
12	#12	37	1.00	0.26	< MDA	< MDA
13	#13	41	1.00	0.27	< MDA	< MDA
14	#14	34	1.00	0.29	< MDA	< MDA
15	#15	38	1.00	0.29	< MDA	< MDA
16	#16	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	38	1.00	0.29	< MDA	< MDA

****

COUNTER: Beckman Model LS 100C DETECTOR: LSC

BACKGROUND DATA: 45.00 (+- 29.2%) CPM

EFFICIENCY DATA:

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

HEALTH PHYSICIST ______________________

ECOLOGY SERVICES, INC.
300 Second St., Laurel, Maryland 20707
(301) 498-1514

Company Name: FDA

RADIATION SAFETY SURVEY

Building / Room: FB-8 / 6082

Authorized Investigator: NAME:

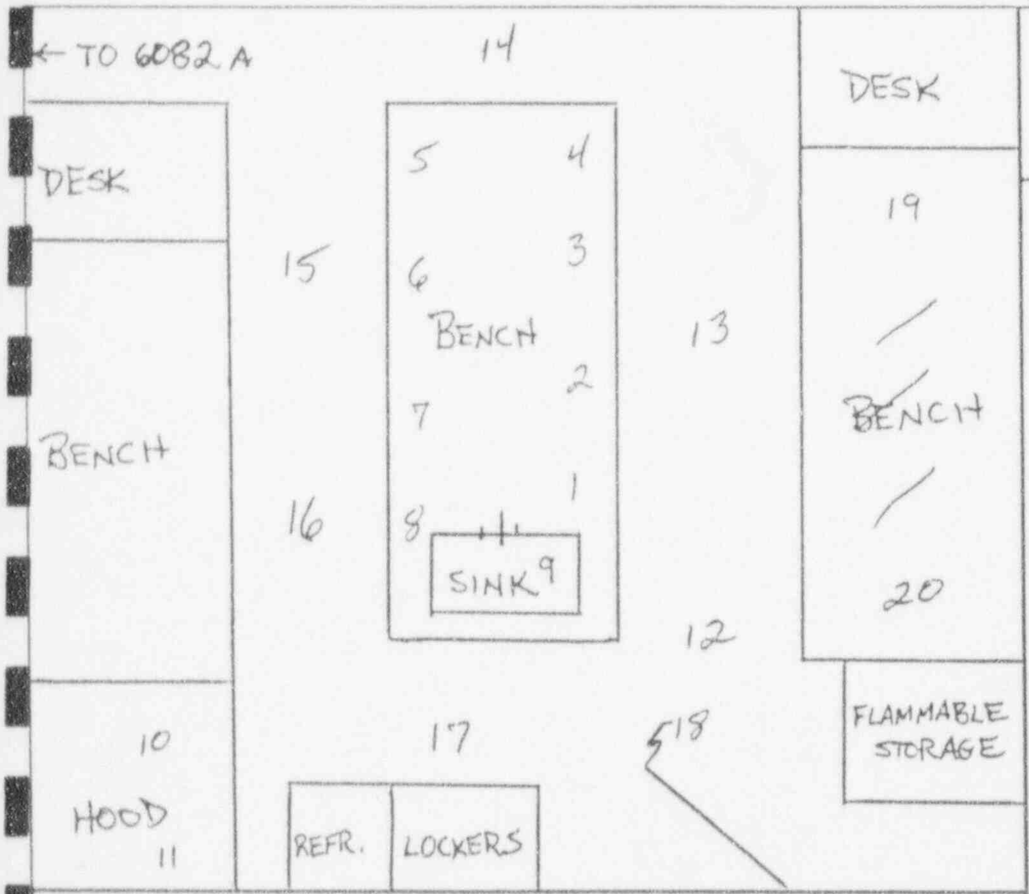
Phone No.

Date: 7-9-92

Surveyor: NAME: KECK, G

Phone No. 498-1514

Survey Meter Used: L12 w/4368 L3 w/AC-3



Wipe Sample Results:

LOCATION:	1	2	3	4	5	6	7	8	9	10
Nuclide 1	ALL <100 DPM									→
Nuclide 2										
Nuclide 3										
Nuclide 4										

Note: All wipe sample results are in units of DPM / 100 sq. cm.

Comments:
Unable to perform a complete closeout. Room currently in use.

Compliance Items: Y - Compliance
Y N ☐ ☐
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
☐ ☐ Adequate use of Shielding
☐ ☐ Prohibition of eating, drinking, etc.
☐ ☐ Inventory & Disposal Records
☐ ☐ Survey Records Current
☐ ☐ Personnel Trained
☐ ☐ Prohibition on Mouth Pipetting
☐ ☐ Radiation Levels
☐ ☐ Contamination (Wipes) < 100 DPM/100 sq. cm.

Survey Instrument:
☐ ☐ Calibration Current
☐ ☐ Operational
☐ ☐ Available
☐ ☐ Other (Specify in Comments)

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ECOLOGY SERVICES, INC.
Data Processing

REPORT OF SAMPLE ANALYSIS

FOR: FDA JOB: Bldg FB8 Room 6082 SAMPLE TYPE: Gross Alpha/Beta

DATE: 07-13-92 BY: ELW

NR	SAMPLE ID	GROSS CT	CT TIME	EFF	DPM	UCI
1	#1	40	1.00	0.28	< 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	< MDA
6	#6	26	1.00	0.29	< MDA	< MDA
7	#7	31	1.00	0.28	< MDA	< MDA
8	#8	25	1.00	0.29	< MDA	< MDA
9	#9	35	1.00	0.29	< MDA	< MDA
10	#10	40	1.00	0.29	< MDA	< MDA
11	#11	25	1.00	0.28	< MDA	< MDA
12	#12	28	1.00	0.29	< MDA	< MDA
13	#13	32	1.00	0.29	< MDA	< MDA
14	#14	37	1.00	0.29	< MDA	< MDA
15	#15	34	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	< MDA
19	#19	28	1.00	0.29	< MDA	< MDA
20	#20	37	1.00	0.27	< MDA	< MDA

****

COUNTER: Beckman Model LS 100C   DETECTOR: 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

HEALTH PHYSICIST ______________________

#

ECOLOGY SERVICES, INC.

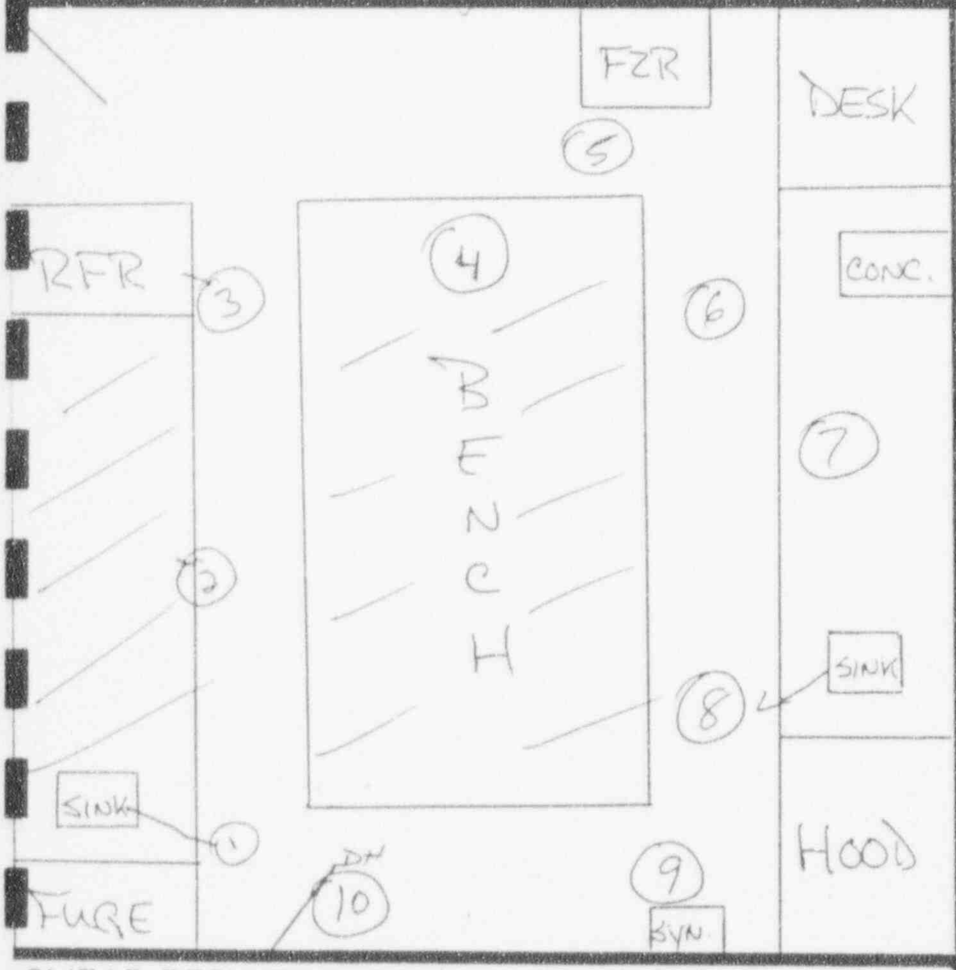
RADIATION SAFETY SURVEY

COMPANY NAME FDA

BLDG FB8

ROOM NO. 3044

AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE NO.	DATE (month, day, year) 07-09-92
SURVEYOR	NAME (last, first initial) Lorenso, JIAN	PHONE NO.	SURVEY METER USED L-12 -43-68



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
\		(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 coats
\		(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
\		(21) Corridor storage meets requirements
\		(22) Radiation levels <2.5 mR/hr
\		(23) Contamination (smears) < 100 dpm
	\	(24) Calibration current
\		(25) Survey meters operational
\		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 β	<100 DPM									→
NUCLIDE 2										
NUCLIDE 3										

METER 1	METER 2	METER 3
SN-27932 L-3-44-9		

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

Rev. Oct 1990

ECOLOGY SERVICES, INC.

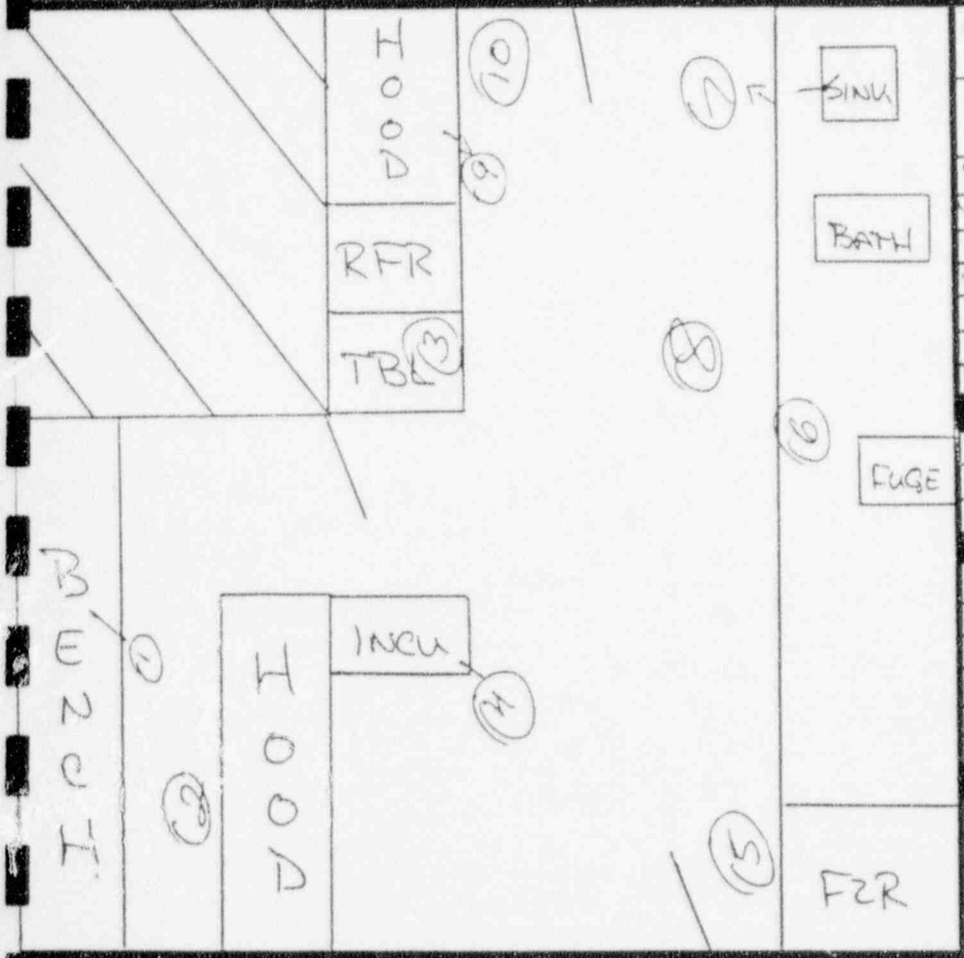
MPANY NAME FDA

RADIATION SAFETY SURVEY

BLDG FB8

ROOM NO. 2266

AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE NO.	DATE (month, day, year) 07-09-92
SURVEYOR	NAME (last, first initial) Lorenso, Juan	PHONE NO.	SURVEY METER USED L-12 - 4368



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
✓		(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 coats
✓		(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
✓		(21) Corridor storage meets requirements
✓		(22) Radiation levels <2.5 mR/hr
✓		(23) Contamination (smears) < 100 dpm
✓		(24) Calibration current
✓		(25) Survey meters operational
✓		(26) Survey meters available
✓		(27) Other (SPECIFY IN REMARKS)

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 P	<100 DPM	→	→	→	→	→	→	→	→	→
NUCLIDE 2										
NUCLIDE 3										

METER 1	METER 2	METER 3

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

Rev. Oct 1990

ECOLOGY SERVICES, INC.

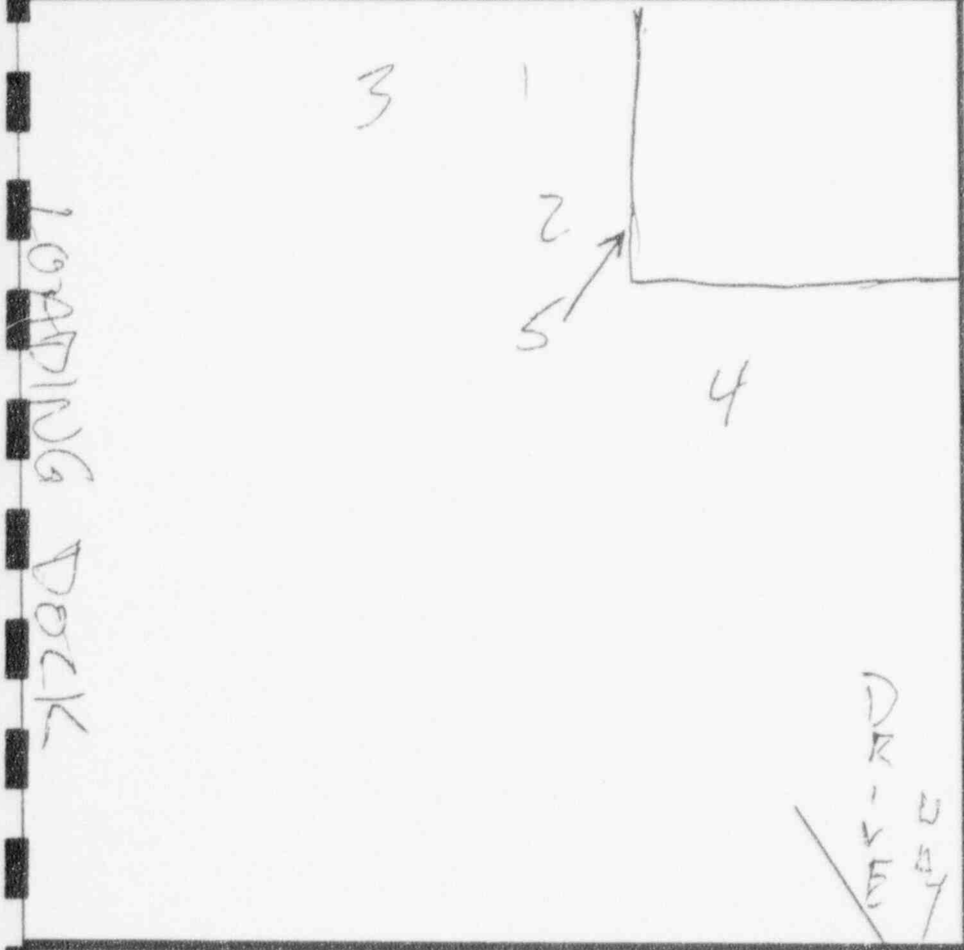
COMPANY NAME FDA

RADIATION SAFETY SURVEY

BLDG. FB8

ROOM NO. GARAGE

AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE NO.	DATE (month, day, year) 7-9-92
SURVEYOR	NAME (last, first initial) KECK, G	PHONE NO.	SURVEY METER USED L12 43-68



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
		(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 coats
		(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
		(21) Corridor storage meets requirements
		(22) Radiation levels <2.5 mR/hr
		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 ?	<100 DPM	→								
NUCLIDE 2										
NUCLIDE 3										

METER 1	METER 2	METER 3

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

Rev. Oct 1990

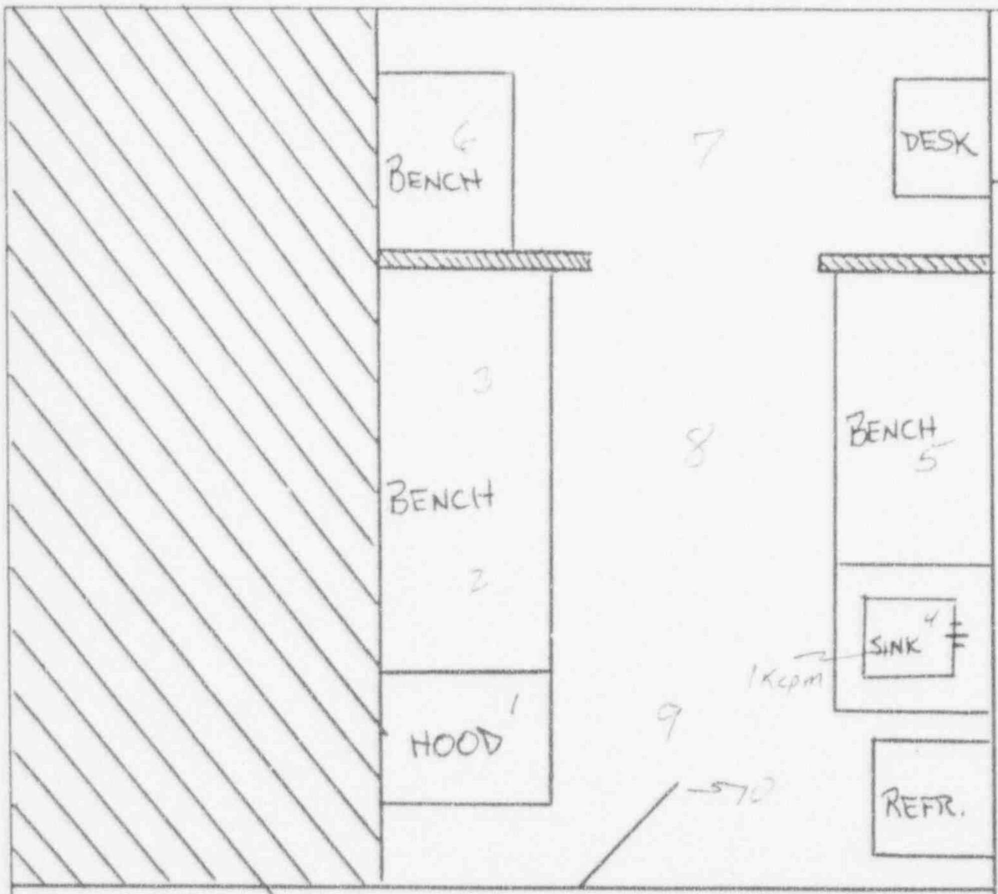
ECOLOGY SERVICES, INC.
300 Second St., Laurel, Maryland 20707
(301) 498-1514

Company Name: FDA

RADIATION SAFETY SURVEY

Building / Room: FB-8 / 3830

Authorized Investigator:	NAME: TALL, BEN	Phone No.	Date: 7-9-92
Surveyor:	NAME: KECK, G	Phone No.	Survey Meter Used L12 w/43-68 L3 w/AC-3



Compliance Items: Y - Compliance

Y N

☐ ☐

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
- ☒ ☐ Adequate use of Shielding
- ☐ ☒ Prohibition of eating, drinking, etc.
- ☐ ☐ Inventory & Disposal Records
- ☐ ☐ Survey Records Current
- ☐ ☐ Personnel Trained
- ☐ ☐ Prohibition on Mouth Pipetting
- ☒ ☐ Radiation Levels
- ☒ ☐ Contamination (Wipes) < 100 DPM/100 sq. cm.

Survey Instrument:

- ☐ ☐ Calibration Current
- ☐ ☐ Operational
- ☐ ☒ Available
- ☐ ☒ Other (Specify in Comments)

Wipe Sample Results:

LOCATION:	1	2	3	4	5	6	7	8	9	10
Nuclide 1	<100 DPM									→
Nuclide 2										
Nuclide 3										
Nuclide 4										

Note: All wipe sample results are in units of DPM / 100 sq. cm.

Comments:
A lab tech was observed carrying a cup of coffee.
OTHER: 1Kgcpm found on sink drain w/43-68 — nothing detectable w/AC-3 probe.

ESI Form HPS.1 Rev 1.0 1/92

ECOLOGY SERVICES, INC.
300 Second St., Laurel, Maryland 20707
(301) 498-1514

Company Name: FDA

RADIATION SAFETY SURVEY

Building / Room: FB-8 / 3028

Authorized Investigator: NAME:

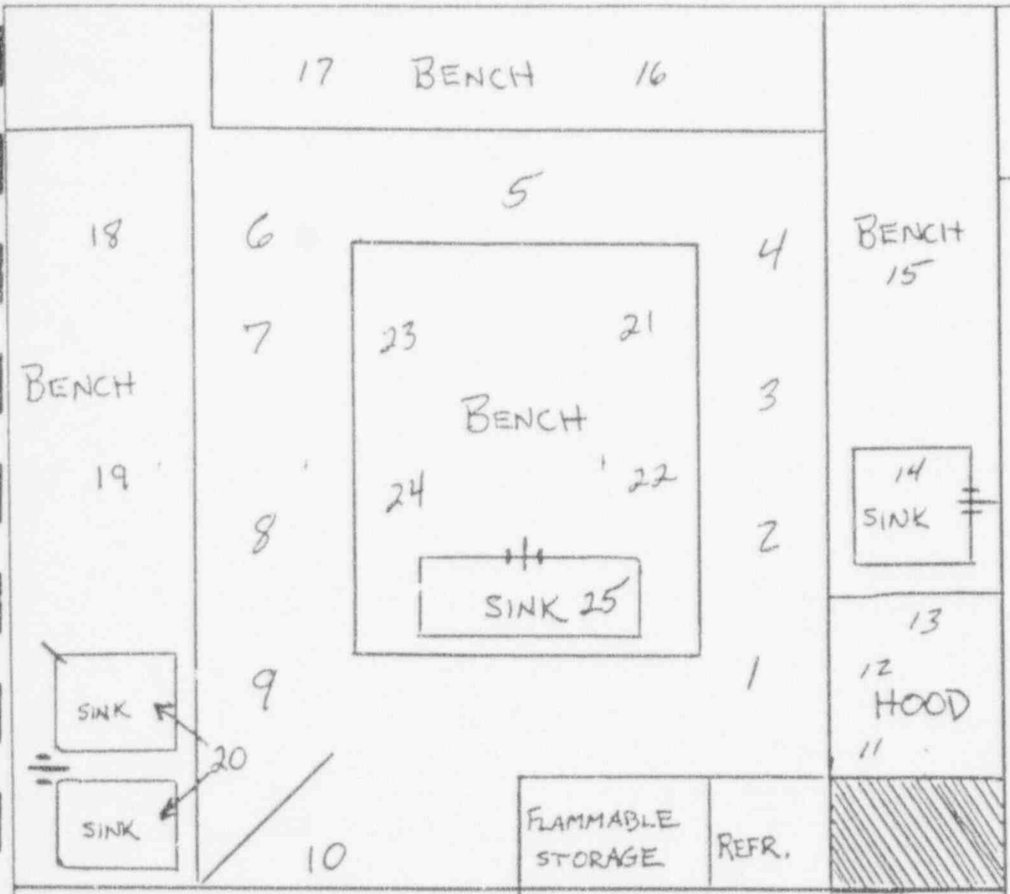
Phone No.

Date: 7-9-92

Surveyor: NAME: KECK, G

Phone No. 498-1514

Survey Meter Used: L12 w/43-68



Wipe Sample Results:

LOCATION:	1	2	3	4	5	6	7	8	9	10
Nuclide 1	ALL <100 DPM	→								
Nuclide 2										
Nuclide 3										
Nuclide 4										

Note: All wipe sample results are in units of DPM / 100 sq. cm.

Compliance Items: Y - Compliance
Y N
☐ ☐
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
- ☐ ☐ Adequate use of Shielding
- ☐ ☐ Prohibition of eating, drinking, etc.
- ☐ ☐ Inventory & Disposal Records
- ☐ ☐ Survey Records Current
- ☐ ☐ Personnel Trained
- ☐ ☐ Prohibition on Mouth Pipetting
- ☐ ☐ Radiation Levels
- ☐ ☐ Contamination (Wipes) < 100 DPM/100 sq. cm.

Survey Instrument:

- ☐ ☐ Calibration Current
- ☐ ☐ Operational
- ☐ ☐ Available
- ☐ ☐ Other (Specify in Comments)

Comments:

Unable to perform a complete closeout. Room corrently in use.

ESI Form HPS.1 Rev 1.0 1/92

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

NR	SAMPLE ID	GROSS CT	CT TIME	EFF	DPM	UCI
1	#1	35	1.00	0.29	< MDA	< MDA
2	#2	31	1.00	0.29	< MDA	< MDA
3	#3	35	1.00	0.30	< MDA	< MDA
4	#4	32	1.00	0.28	< MDA	< MDA
5	#5	27	1.00	0.28	< MDA	< MDA
6	#6	37	1.00	0.29	< MDA	< MDA
7	#7	37	1.00	0.29	< MDA	< MDA
8	#8	40	1.00	0.29	< MDA	< MDA
9	#9	29	1.00	0.28	< MDA	< MDA
10	#10	22	1.00	0.29	< MDA	< MDA
11	#11	32	1.00	0.27	< MDA	< MDA
12	#12	27	1.00	0.29	< MDA	< MDA
13	#13	30	1.00	0.28	< MDA	< MDA
14	#14	28	1.00	0.28	< MDA	< MDA
15	#15	37	1.00	0.28	< MDA	< MDA
16	#16	32	1.00	0.29	< MDA	< MDA
17	#17	35	1.00	0.29	< MDA	< MDA
18	#18	33	1.00	0.28	< MDA	< MDA
19	#19	29	1.00	0.28	< MDA	< MDA
20	#20	36	1.00	0.28	< MDA	< MDA

****

COUNTER: Beckman Model LS 100C DETECTOR: LSC

BACKGROUND DATA: 35.00 (+- 33.1%) CPM

EFFICIENCY DATA:

MEAN EFFICIENCY: 0.28+-(5.0%)

MDA DATA: 28 CTS FOR 1 MIN 104 DPM 4.68E-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

NR	SAMPLE ID	GROSS CT	CT TIME	EFF	DPM	UCI
1	#21	35	1.00	0.28	< MDA	< MDA
2	#22	30	1.00	0.28	< MDA	< MDA
3	#23	34	1.00	0.28	< MDA	< MDA
4	#24	33	1.00	0.28	< MDA	< MDA
5	#25	29	1.00	0.29	< MDA	< MDA

****

COUNTER: Beckman Model LS 100C   DETECTOR: LSC

BACKGROUND DATA: 35.00 (+- 33.1%) 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 ____________________

ECOLOGY SERVICES, INC.

COMPANY NAME FDA

RADIATION SAFETY SURVEY

BLDG FB8

ROOM NO. 6846

AUTHORIZED INVESTIGATOR NAME (last, first initial)

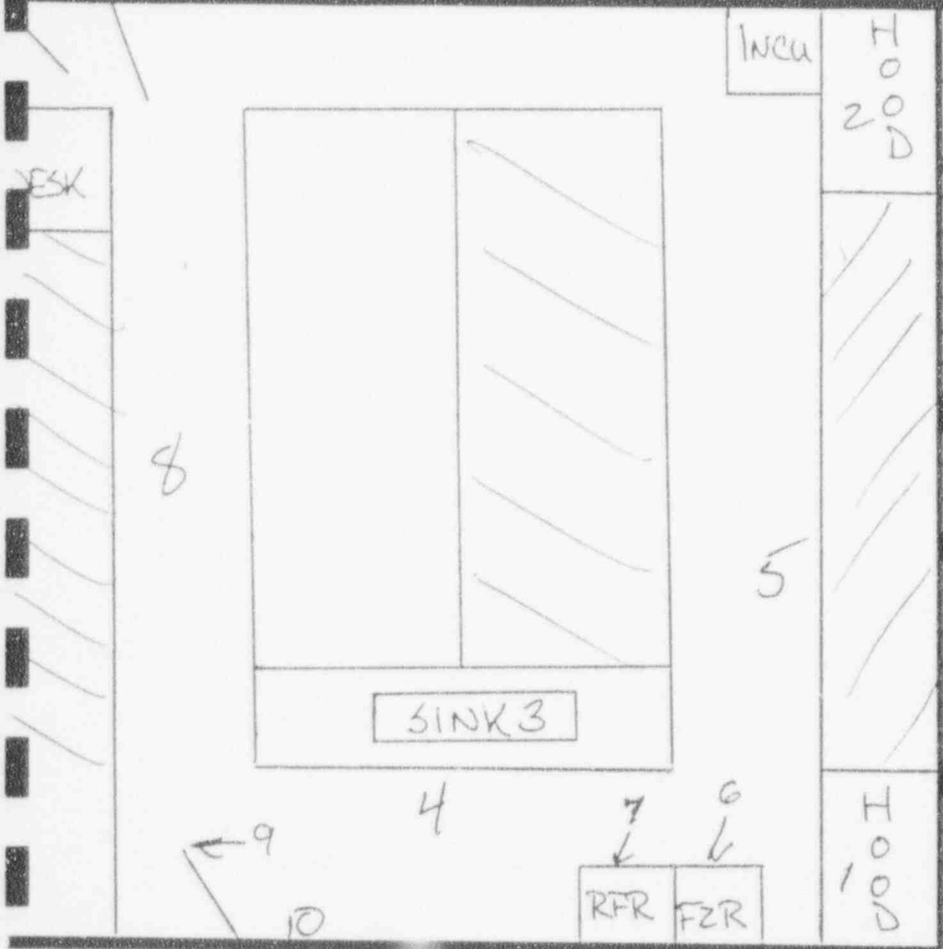
PHONE NO.

DATE (month, day, year) 7-9-92

SURVEYOR NAME (last, first initial) KECK, G

PHONE NO.

SURVEY METER USED N/A



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
✓		(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 coats
✓		(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
✓		(21) Corridor storage meets requirements
✓		(22) Radiation levels < 2.5 mR/hr
✓		(23) Contamination (smears) < 100 dpm
✓		(24) Calibration current
✓		(25) Survey meters operational
✓		(26) Survey meters available
✓		~~(27) Other~~ (SPECIFY IN REMARKS)

METER 1	METER 2	METER 3

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 3H	<100 DPM									→
NUCLIDE 2										
NUCLIDE 3										

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

Rev. Oct 1990

ECOLOGY SERVICES, INC.

PANY NAME FDA

RADIATION SAFETY SURVEY

BLDG FB8

ROOM NO. 6446

AUTHORIZED INVESTIGATOR NAME (last, first initial)

PHONE NO.

DATE (month, day, year) 7-9-92

SURVEYOR NAME (last, first initial) KECK, G

PHONE NO.

SURVEY METER USED L12 w/43-68

COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
✓		(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 coats
✓		(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
✓		(21) Corridor storage meets requirements
✓		(22) Radiation levels < 2.5 mR/hr
✓		(23) Contamination (smears) < 100 dpm
✓		(24) Calibration current
✓		(25) Survey meters operational
✓		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 P	<100 DPM	→								
NUCLIDE 2 Cr	<100 DPM	→								
NUCLIDE 3										

METER 1	METER 2	METER 3

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

Rev. Oct 1990

ECOLOGY SERVICES, INC.

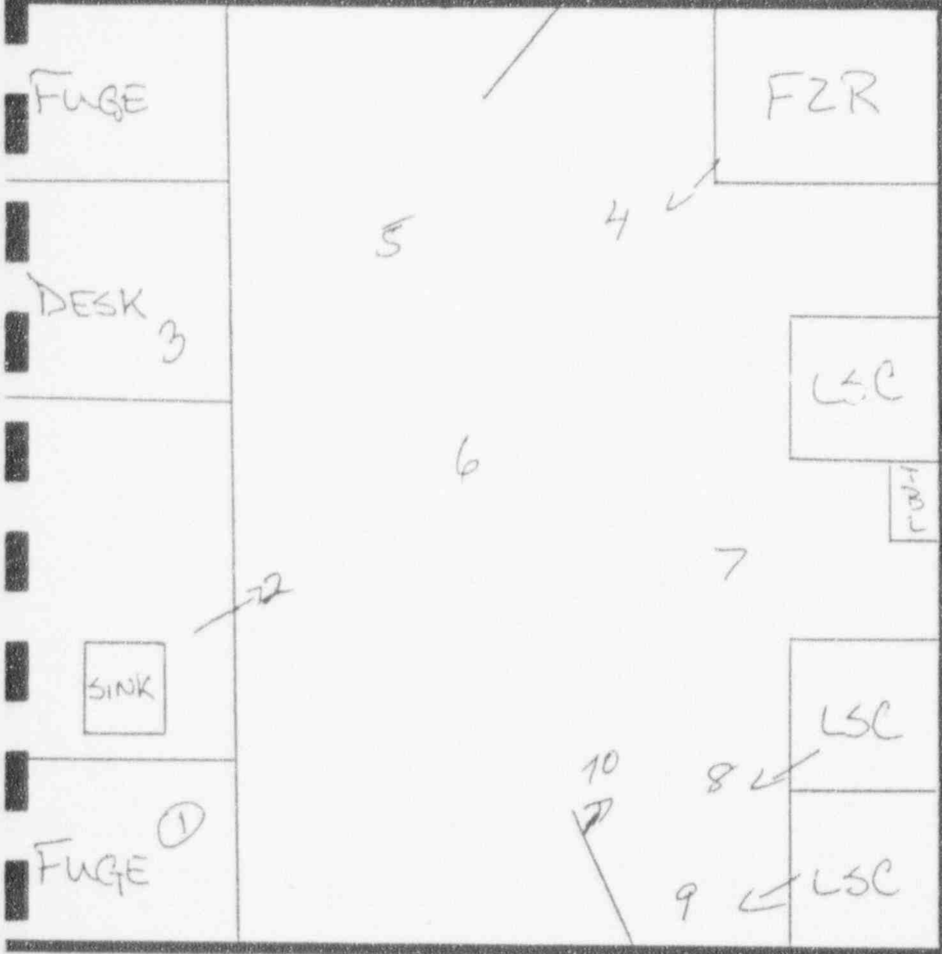
RADIATION SAFETY SURVEY

COMPANY NAME FDA

BLDG FB8

ROOM NO. 6448

AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE NO.	DATE (month, day, year) 07-05-92
SURVEYOR	NAME (last, first initial) Luengo, Juan	PHONE NO.	SURVEY METER USED L-12 - 43-68



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
✓		(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 coats
✓		(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
✓		(21) Corridor storage meets requirements
✓		(22) Radiation levels < 2.5 mR/hr
✓		(23) Contamination (smears) < 100 dpm
✓		(24) Calibration current
✓		(25) Survey meters operational
✓		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

METER 1	METER 2	METER 3

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 P	<100 DPM									
NUCLIDE 2										
NUCLIDE 3										

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

Rev. Oct 1990

ECOLOGY SERVICES, INC.

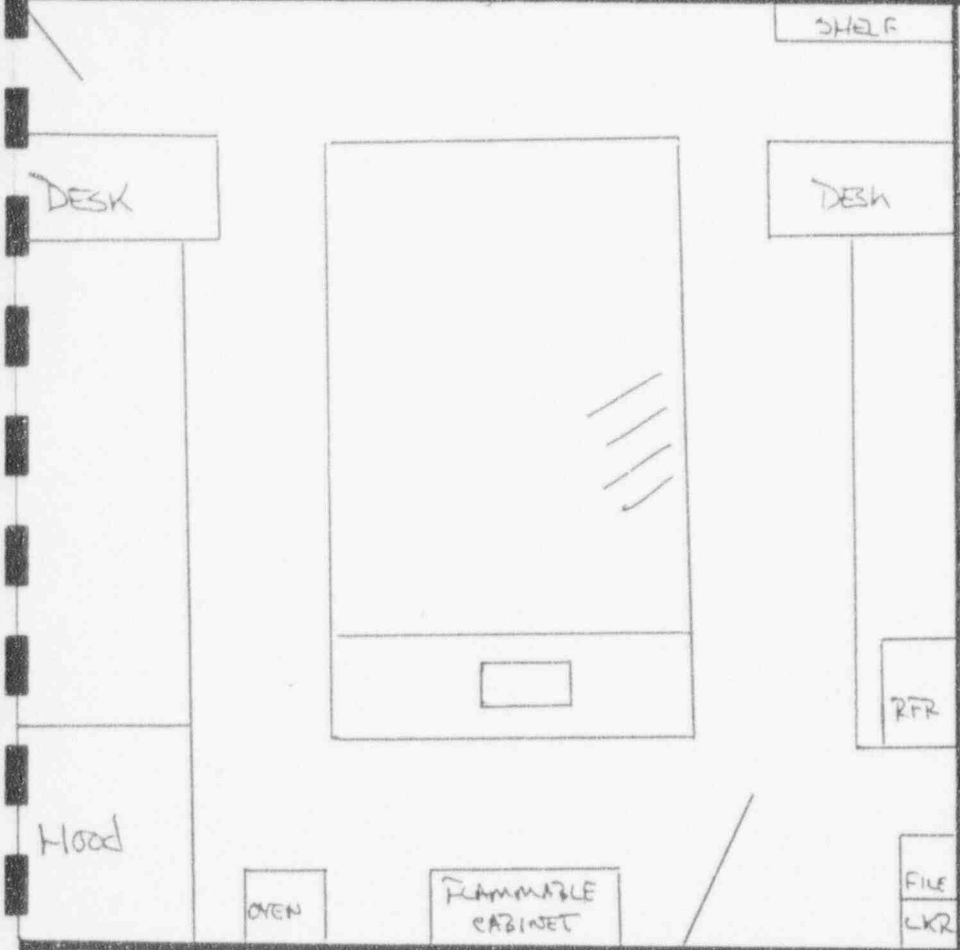
RADIATION SAFETY SURVEY

[illegible]MPANY NAME FDA

BLDG. FB8

ROOM NO. 4826

AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE NO.	DATE (month, day, year) 07-09-92
SURVEYOR	NAME (last, first initial) Lorenzo, Juan	PHONE NO.	SURVEY METER USED L-12 43-68



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
		(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 coats
		(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
		(21) Corridor storage meets requirements
		(22) Radiation levels < 2.5 mR/hr
		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 14C										
NUCLIDE 2										
NUCLIDE 3										

METER 1	METER 2	METER 3
L3 w/44-9 SN 13127		

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

NO RAM USED IN PAST 30 DAYS

Rev. Oct 1990

*

ECOLOGY SERVICES, INC.

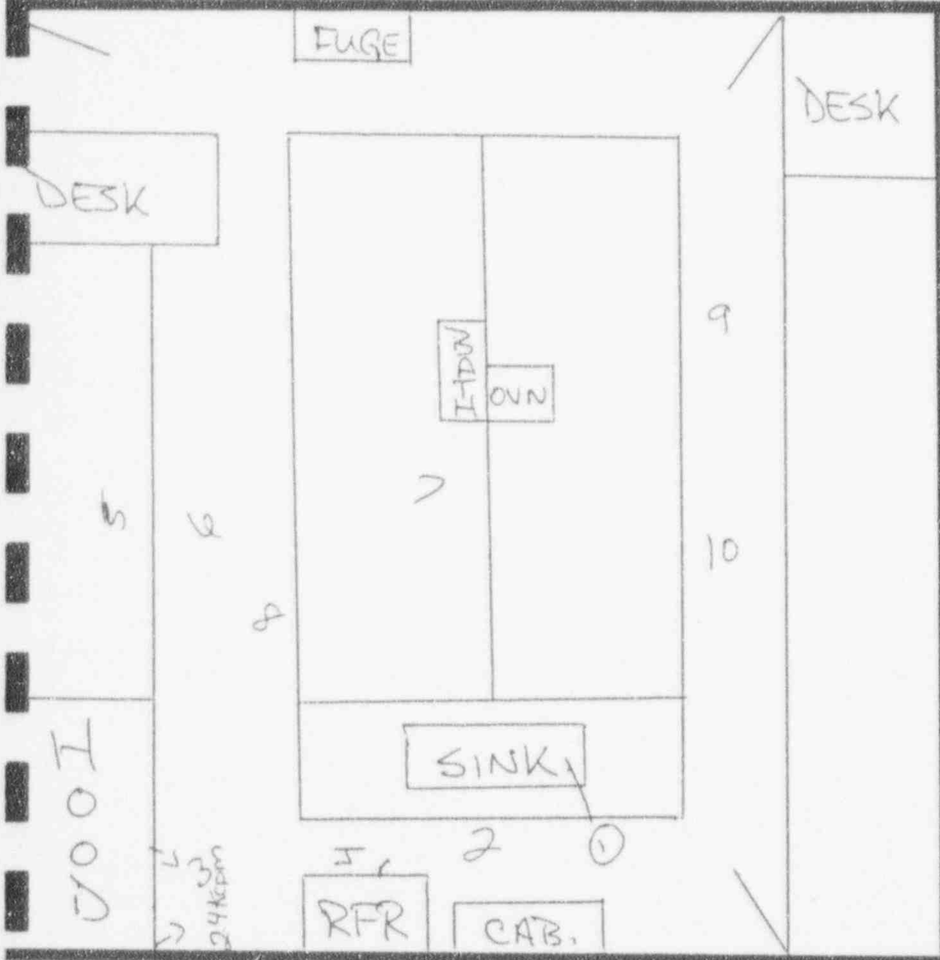
COMPANY NAME FDA

RADIATION SAFETY SURVEY

BLDG. FB8

ROOM NO. 4418

AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE NO.	DATE (month, day, year) 07-09-92
SURVEYOR	NAME (last, first initial) Lorenzo, Juan	PHONE NO.	SURVEY METER USED 2-12-43-68



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
✓		(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 coats
✓		(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
✓		(21) Corridor storage meets requirements
✓		(22) Radiation levels < 2.5 mR/hr
✓		(23) Contamination (smears) < 100 dpm
	✓	(24) Calibration current
✓		(25) Survey meters operational
✓		(26) Survey meters available
	✓	(27) Other (SPECIFY IN REMARKS)

METER 1	METER 2	METER 3
LS 4/44-9 S/N 8028		

MEAR RESULTS (in DPM) (fill in the nuclide(s) down the ide of the table. All smears 100 cm²)

OCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 14C	<100 DPM	→	→	→	→	→	→	→	→	→
UCLIDE 2										
UCLIDE 3										

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

BROKEN FLOOR TILES NOT LABELLED RAM

IN FRONT OF THE HOOD 2.4 KGCPM — 9,130 DPM/100cm²

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ECOLOGY SERVICES, INC.

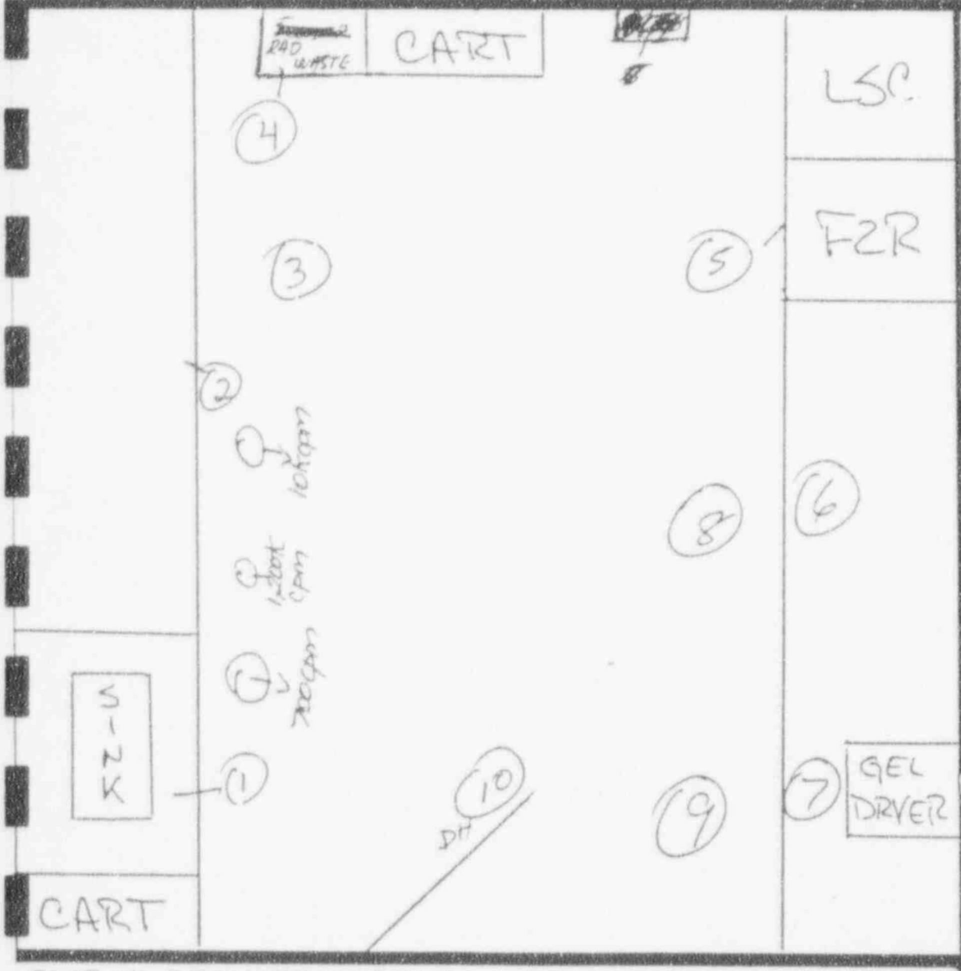
COMPANY NAME FDA

RADIATION SAFETY SURVEY

BLDG FB8

ROOM NO. 3756

AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE NO.	DATE (month, day, year) 07-09-92
SURVEYOR	NAME (last, first initial) Luenso, Juan	PHONE NO.	SURVEY METER USED L-12 - 43-68



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
✓		(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 coats
✓		(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
✓		(21) Corridor storage meets requirements
✓		(22) Radiation levels <2.5 mR/hr
✓		(23) Contamination (smears) < 100 dpm
✓		(24) Calibration current
✓		(25) Survey meters operational
✓		(26) Survey meters available
	☒	(27) Other (SPECIFY IN REMARKS)

METER 1	METER 2	METER 3
[illegible]		

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 35S	<100 DPM	→								
NUCLIDE 2										
NUCLIDE 3										

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

7) FLOOR IN FRONT OF BENCH

700 GCPM - 1740 DPM/100 cm²

1,200 GCPM - 3913 DPM/100 cm²

10K GCPM 42,174 DPM/100 cm²

Rev. Oct 1990

ECOLOGY SERVICES, INC.
300 Second St., Laurel, Maryland 20707
(301) 498-1514

Company Name: FDA

RADIATION SAFETY SURVEY

Building / Room: MOD 1 / G402

Authorized Investigator: NAME:

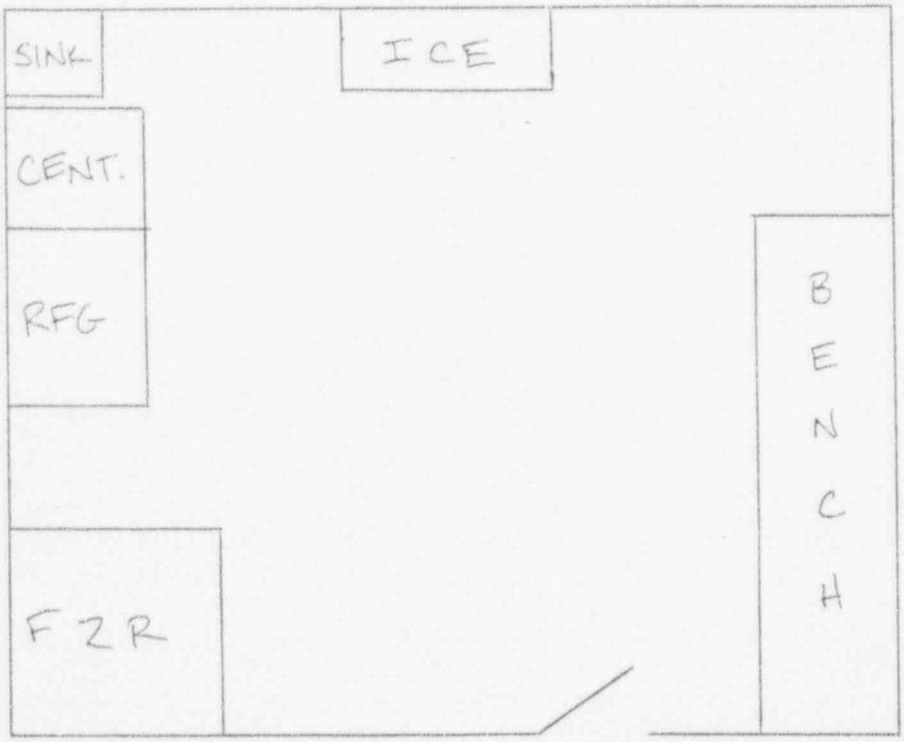
Phone No.

Date: 6-24-92

Surveyor: NAME: WATTS, C

Phone No.

Survey Meter Used



Compliance Items: Y - Compliance
N - Non-Compliance
Blank - Not Evaluated

Y N
☐ ☐

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, etc.
- ☐ ☐ Inventory & Disposal Records
- ☐ ☐ Survey Records Current
- ☐ ☐ Personnel Trained
- ☐ ☐ Prohibition on Mouth Pipetting
- ☐ ☐ Radiation Levels
- ☐ ☐ Contamination (Wipes) < 100 DPM/100 sq. cm.

Survey Instrument:

- ☐ ☐ Calibration Current
- ☐ ☐ Operational
- ☐ ☐ Available
- ☐ ☐ Other (Specify in Comments)

Wipe Sample Results:

LOCATION:	1	2	3	4	5	6	7	8	9	10
Nuclide 1										
Nuclide 2										
Nuclide 3										
Nuclide 4										

Note: All wipe sample results are in units of DPM / 100 sq. cm.

Comments:

NO RAM USE SINCE LAST SURVEY

ESI Form HPS.1 Rev 1.0 1/92

ECOLOGY SERVICES, INC.
300 Second St., Laurel, Maryland 20707
(301) 498-1514

Company Name: FDA

RADIATION SAFETY SURVEY

Building / Room: MOD 1 / 2418

Authorized Investigator: NAME: Bronaugh, R.

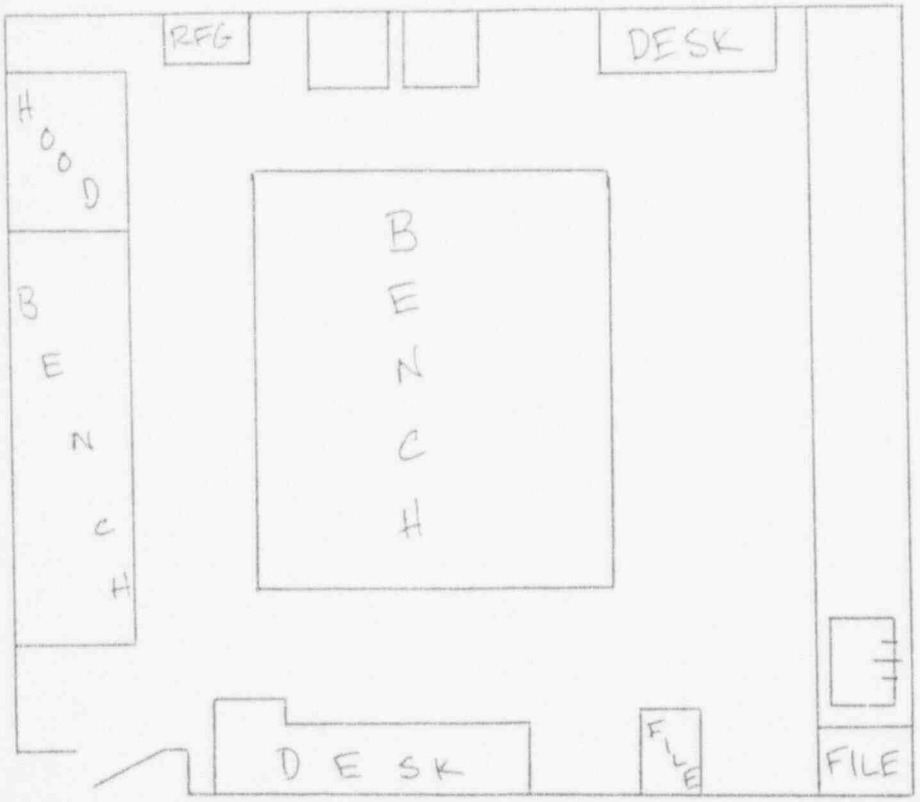
Phone No.

Date: 6-24-92

Surveyor: NAME: Watts, C

Phone No.

Survey Meter Used



Compliance Items: Y - Compliance
N - Non-Compliance
Blank - Not Evaluated

Y N
☐ ☐

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, etc.
- ☐ ☐ Inventory & Disposal Records
- ☐ ☐ Survey Records Current
- ☐ ☐ Personnel Trained
- ☐ ☐ Prohibition on Mouth Pipetting
- ☐ ☐ Radiation Levels
- ☐ ☐ Contamination (Wipes) < 100 DPM/100 sq. cm.

Survey Instrument:

- ☐ ☐ Calibration Current
- ☐ ☐ Operational
- ☐ ☐ Available
- ☐ ☐ Other (Specify in Comments)

Wipe Sample Results:

LOCATION:	1	2	3	4	5	6	7	8	9	10
Nuclide 1										
Nuclide 2										
Nuclide 3										
Nuclide 4										

Note: All wipe sample results are in units of DPM / 100 sq. cm.

Comments:

No RAM Use Since Last Survey

ECOLOGY SERVICES, INC.
300 Second St., Laurel, Maryland 20707
(301) 498-1514

Company Name: FDA

RADIATION SAFETY SURVEY

Building / Room: MOD 1 / 2321

Authorized Investigator: NAME: Bronaugh, R

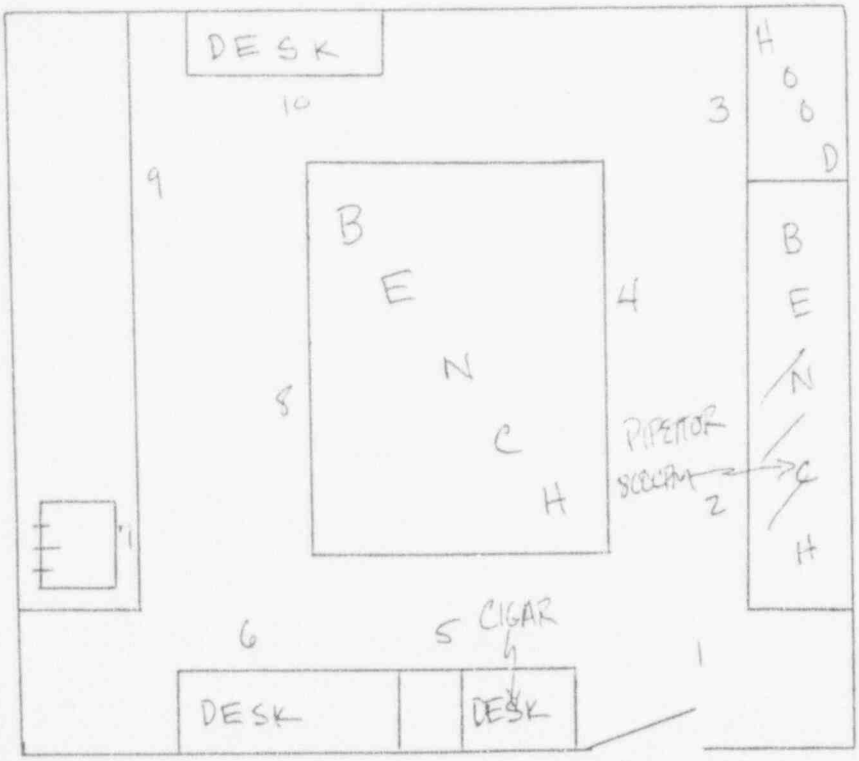
Phone No.

Date: 6-24-92

Surveyor: NAME: WATTS, C

Phone No.

Survey Meter Used: L3 w/44-9



Compliance Items: Y - Compliance

Y N

☐ ☐

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
- ☑ ☐ Adequate use of Shielding
- ☐ ☑ Prohibition of eating, drinking, etc.
- ☑ ☐ Inventory & Disposal Records
- ☑ ☐ Survey Records Current
- ☑ ☐ Personnel Trained
- ☑ ☐ Prohibition on Mouth Pipetting
- ☑ ☐ Radiation Levels
- ☑ ☐ Contamination (Wipes) < 100 DPM/100 sq. cm.

Survey Instrument:

- ☑ ☐ Calibration Current
- ☑ ☐ Operational
- ☑ ☐ Available
- ☐ ☑ Other (Specify in Comments)

Wipe Sample Results:

LOCATION:	1	2	3	4	5	6	7	8	9	10
Nuclide 1 ^{14}C	<100 ⟶									
Nuclide 2										
Nuclide 3										
Nuclide 4										

Note: All wipe sample results are in units of DPM / 100 sq. cm.

Comments:
EXTINGUISHED CIGAR ON DESK; PRESUMPTIVE EVIDENCE
PIPETTOR ON BENCH CONTAMINATED, NOT LABELED

ESI Form HPS.1 Rev 1.0 1/92

ECOLOGY SERVICES, INC.
300 Second St., Laurel, Maryland 20707
(301) 498-1514

Company Name: FDA

RADIATION SAFETY SURVEY

Building / Room: MOD 1 / 2313

Authorized Investigator: NAME: Bronaugh, R

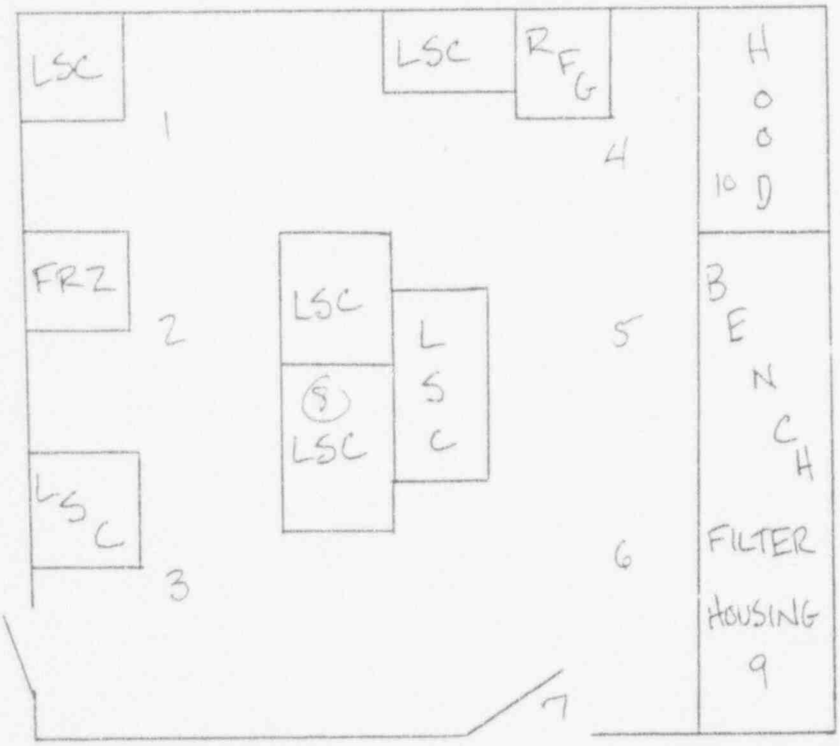
Phone No.:

Date: 6-24-92

Surveyor: NAME: WATTS, C

Phone No.:

Survey Meter Used: L3 w/44-9



Wipe Sample Results:

LOCATION:	1	2	3	4	5	6	7	8	9	10
Nuclide 1 P	< 100									→
Nuclide 2										
Nuclide 3										
Nuclide 4										

Note: All wipe sample results are in units of DPM / 100 sq. cm.

Comments:

Compliance Items: Y - Compliance
Y N — 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
- ☑ ☐ Adequate use of Shielding
- ☑ ☐ Prohibition of eating, drinking, etc.
- ☑ ☐ Inventory & Disposal Records
- ☑ ☐ Survey Records Current
- ☑ ☐ Personnel Trained
- ☑ ☐ Prohibition on Mouth Pipetting
- ☑ ☐ Radiation Levels
- ☑ ☐ Contamination (Wipes) < 100 DPM/100 sq. cm.

Survey Instrument:

- ☐ ☐ Calibration Current
- ☐ ☐ Operational
- ☐ ☐ Available
- ☐ ☐ Other (Specify in Comments)

ESI Form HPS.1 Rev 1.0 1/92

ECOLOGY SERVICES, INC.
300 Second St., Laurel, Maryland 20707
(301) 498-1514

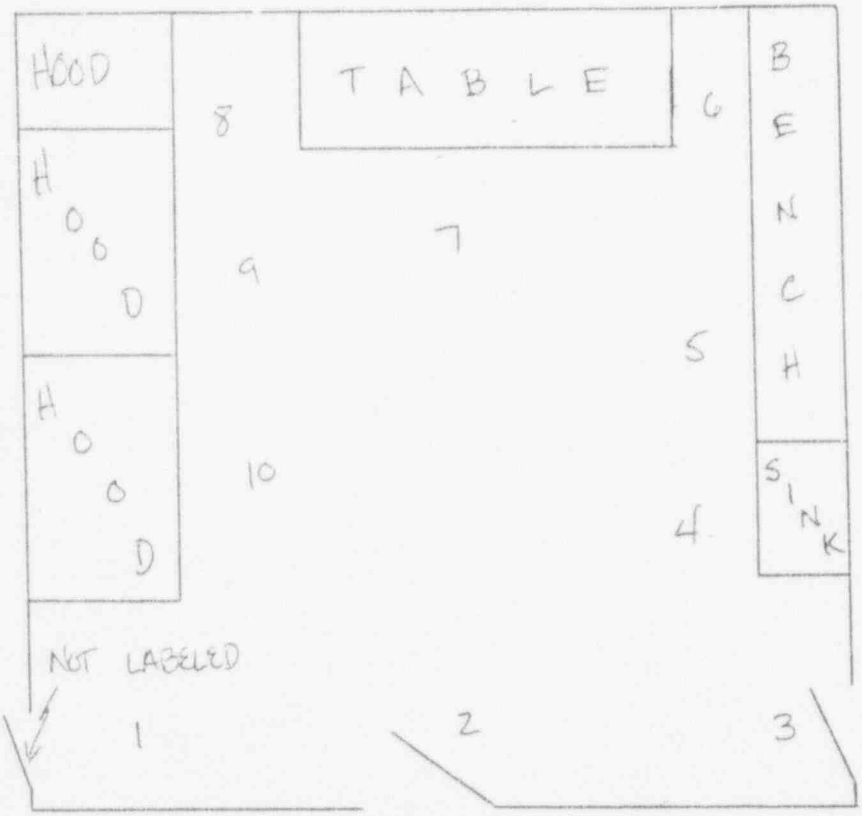
Company Name: FDA

RADIATION SAFETY SURVEY

Building / Room: MOD 1 / 2315

Authorized Investigator: NAME: Bronaugh, R
Phone No.:
Date: 6-24-92

Surveyor: NAME: KECK, G
Phone No.:
Survey Meter Used: L3 w/ 44-9



Compliance Items: Y - Compliance
Y N
☐ ☐ 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
☑ ☐ Adequate use of Shielding
☑ ☐ Prohibition of eating, drinking, etc.
☑ ☐ Inventory & Disposal Records
☑ ☐ Survey Records Current
☑ ☐ Personnel Trained
☑ ☐ Prohibition on Mouth Pipetting
☑ ☐ Radiation Levels
☑ ☐ Contamination (Wipes) < 100 DPM/100 sq. cm.

Survey Instrument:
☐ ☐ Calibration Current
☐ ☐ Operational
☐ ☐ Available
☐ ☐ Other (Specify in Comments)

Wipe Sample Results:

LOCATION:	1	2	3	4	5	6	7	8	9	10
Nuclide 1 B	<100	→								→
Nuclide 2										
Nuclide 3										
Nuclide 4										

Note: All wipe sample results are in units of DPM / 100 sq. cm.

Comments:
SIDE DOOR TO RESTRICTED AREA NOT LABELED

ESI Form HPS.1 Rev 1.0 1/92

ECOLOGY SERVICES, INC.
300 Second St., Laurel, Maryland 20707
(301) 498-1514

Company Name: FDA

RADIATION SAFETY SURVEY

Building / Room: MOD 1 / 1107

Authorized Investigator: NAME:

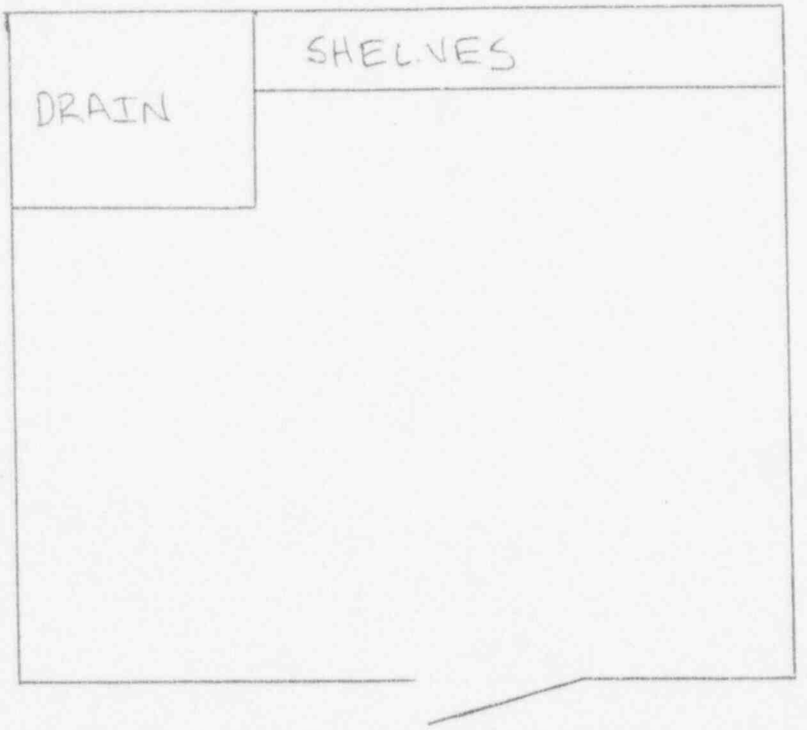
Phone No.

Date: 6-24-92

Surveyor: NAME: WATTS, C

Phone No.

Survey Meter Used



Wipe Sample Results:

LOCATION:	1	2	3	4	5	6	7	8	9	10
Nuclide 1										
Nuclide 2										
Nuclide 3										
Nuclide 4										

Note: All wipe sample results are in units of DPM / 100 sq. cm.

Comments:

NO RAM USE SINCE LAST SURVEY

Compliance Items: Y - Compliance
N - Non-Compliance
Blank - Not Evaluated

Y N
☐ ☐

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, etc.
- ☐ ☐ Inventory & Disposal Records
- ☐ ☐ Survey Records Current
- ☐ ☐ Personnel Trained
- ☐ ☐ Prohibition on Mouth Pipetting
- ☐ ☐ Radiation Levels
- ☐ ☐ Contamination (Wipes) < 100 DPM/100 sq. cm.

Survey Instrument:

- ☐ ☐ Calibration Current
- ☐ ☐ Operational
- ☐ ☐ Available
- ☐ ☐ Other (Specify in Comments)

ESI Form HPS.1 Rev 1.0 1/92

ECOLOGY SERVICES, INC.
300 Second St., Laurel, Maryland 20707
(301) 498-1514

Company Name: FDA

RADIATION SAFETY SURVEY

Building / Room: MOD 1 / G414

Authorized Investigator: NAME: Rayburne

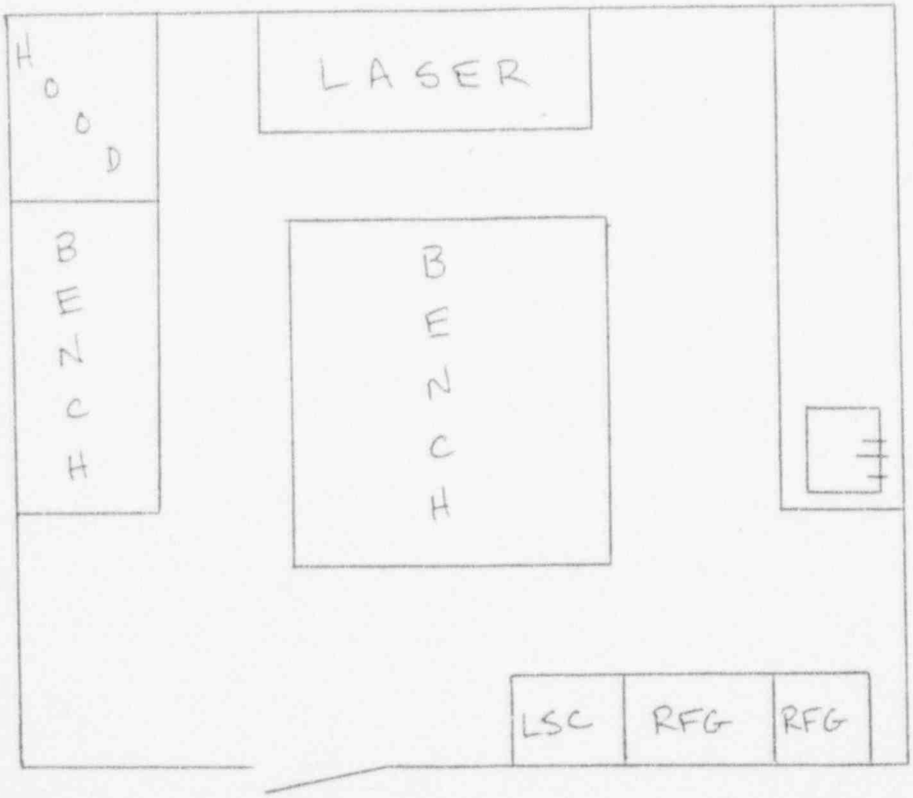
Phone No.

Date: 6-24-92

Surveyor: NAME: WATTS, C

Phone No.

Survey Meter Used



Wipe Sample Results:

LOCATION:	1	2	3	4	5	6	7	8	9	10
Nuclide 1										
Nuclide 2										
Nuclide 3										
Nuclide 4										

Note: All wipe sample results are in units of DPM / 100 sq. cm.

Compliance Items: Y - Compliance

Y N — 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
- ☐ ☐ Adequate use of Shielding
- ☐ ☐ Prohibition of eating, drinking, etc.
- ☐ ☐ Inventory & Disposal Records
- ☐ ☐ Survey Records Current
- ☐ ☐ Personnel Trained
- ☐ ☐ Prohibition on Mouth Pipetting
- ☐ ☐ Radiation Levels
- ☐ ☐ Contamination (Wipes) < 100 DPM/100 sq. cm.

Survey Instrument:

- ☐ ☐ Calibration Current
- ☐ ☐ Operational
- ☐ ☐ Available
- ☐ ☐ Other (Specify in Comments)

Comments:

No RAM use since last survey

ECOLOGY SERVICES, INC.
300 Second St., Laurel, Maryland 20707
(301) 498-1514

Company Name: FDA

RADIATION SAFETY SURVEY

Building / Room: MOD 1 / 2305

Authorized Investigator: NAME: Bronaugh, R

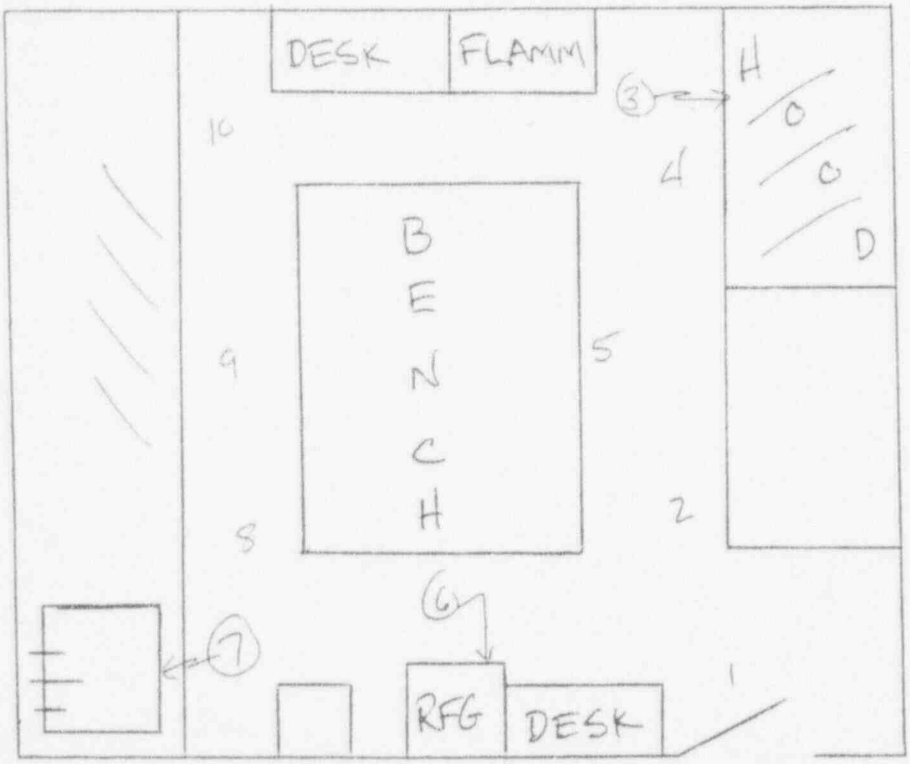
Phone No.:

Date: 6-24-92

Surveyor: NAME: WATTS C

Phone No.:

Survey Meter Used: L3 w/ 44-9



Compliance Items: Y - Compliance
N - Non-Compliance
Blank - Not Evaluated

Compliance Items:

Y	N	
☑	☐	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, etc.
☑	☐	Inventory & Disposal Records
☑	☐	Survey Records Current
☐	☐	Personnel Trained
☑	☐	Prohibition on Mouth Pipetting
☑	☐	Radiation Levels
☑	☐	Contamination (Wipes) < 100 DPM/100 sq. cm.

Survey Instrument:

Y	N	
☑	☐	Calibration Current
☑	☐	Operational
☑	☐	Available
☐	☐	Other (Specify in Comments)

Wipe Sample Results:

LOCATION:	1	2	3	4	5	6	7	8	9	10
Nuclide 1 β	<100 →									
Nuclide 2										
Nuclide 3										
Nuclide 4										

Note: All wipe sample results are in units of DPM / 100 sq. cm.

Comments:

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ECOLOGY SERVICES, INC.
300 Second St., Laurel, Maryland 20707
(301) 498-1514

Company Name: FDA

RADIATION SAFETY SURVEY

Building / Room: MOD 1 / WASTE

Authorized Investigator: NAME: CFSAN, SAFETY OFFICE

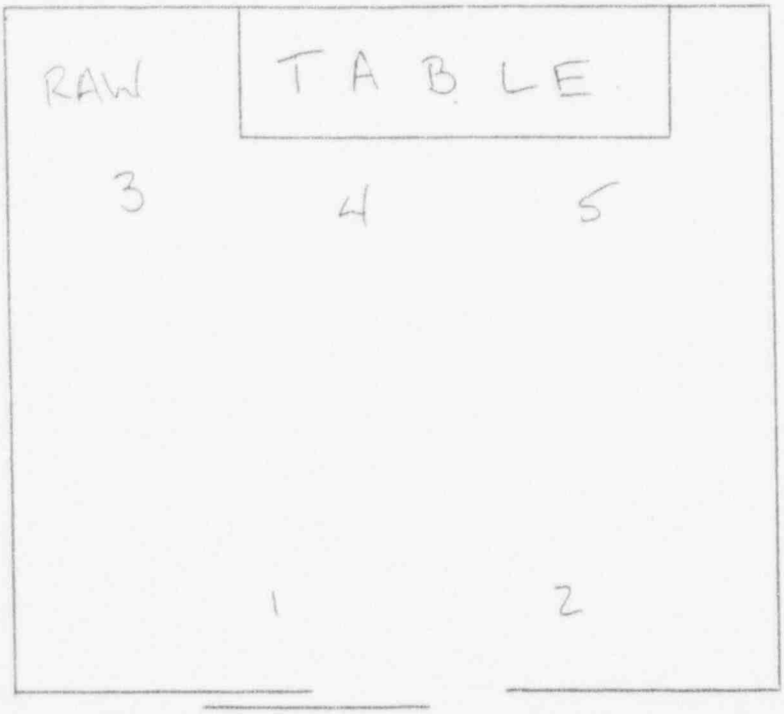
Phone No.

Date: 6-24-92

Surveyor: NAME: WATTS, C

Phone No.

Survey Meter Used: L3 w/44-9



Wipe Sample Results:

LOCATION:	1	2	3	4	5	6	7	8	9	10
Nuclide 1 β	<100	→	→	→	→					
Nuclide 2										
Nuclide 3										
Nuclide 4										

Note: All wipe sample results are in units of DPM / 100 sq. cm.

Comments:

Compliance Items: Y - Compliance
N - Non-Compliance
Blank - Not Evaluated

Y N
☐ ☐

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, etc.
- ☑ ☐ Inventory & Disposal Records
- ☑ ☐ Survey Records Current
- ☑ ☐ Personnel Trained
- ☑ ☐ Prohibition on Mouth Pipetting
- ☑ ☐ Radiation Levels
- ☐ ☐ Contamination (Wipes) < 100 DPM/100 sq. cm.

Survey Instrument:

- ☐ ☐ Calibration Current
- ☐ ☐ Operational
- ☐ ☐ Available
- ☐ ☐ Other (Specify in Comments)

ESI Form HPS.1 Rev 1.0 1/92

ECOLOGY SERVICES, INC.
300 Second St., Laurel, Maryland 20707
(301) 498-1514

Company Name: FDA

RADIATION SAFETY SURVEY

Building / Room: MOD 1 / 3404

Authorized Investigator: NAME: Sistare, F

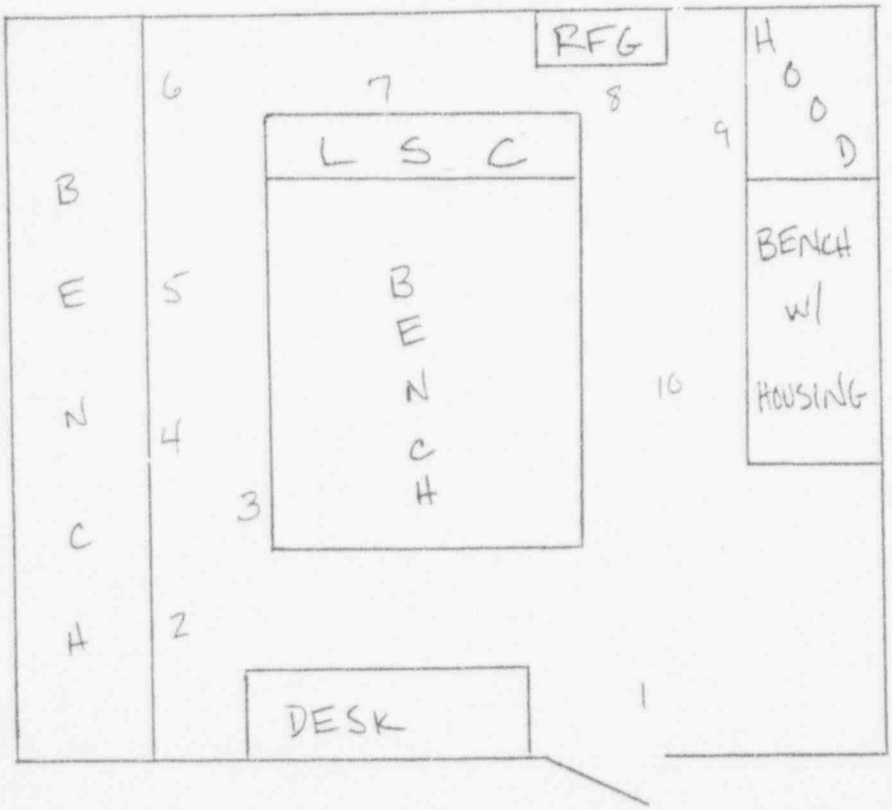
Phone No.

Date: 6-24-92

Surveyor: NAME: WATTS, C

Phone No.

Survey Meter Used: L3 w/ 44-9



Wipe Sample Results:

LOCATION:	1	2	3	4	5	6	7	8	9	10
Nuclide 1 β	<100	→								
Nuclide 2										
Nuclide 3										
Nuclide 4										

Note: All wipe sample results are in units of DPM / 100 sq. cm.

Comments:

Compliance Items: Y - Compliance
Y N   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
☑ ☐ Adequate use of Shielding
☑ ☐ Prohibition of eating, drinking, etc.
☑ ☐ Inventory & Disposal Records
☑ ☐ Survey Records Current
☑ ☐ Personnel Trained
☑ ☐ Prohibition on Mouth Pipetting
☑ ☐ Radiation Levels
☑ ☐ Contamination (Wipes) < 100 DPM/100 sq. cm.

Survey Instrument:
☐ ☐ Calibration Current
☐ ☐ Operational
☐ ☐ Available
☐ ☐ Other (Specify in Comments)

ECOLOGY SERVICES, INC.

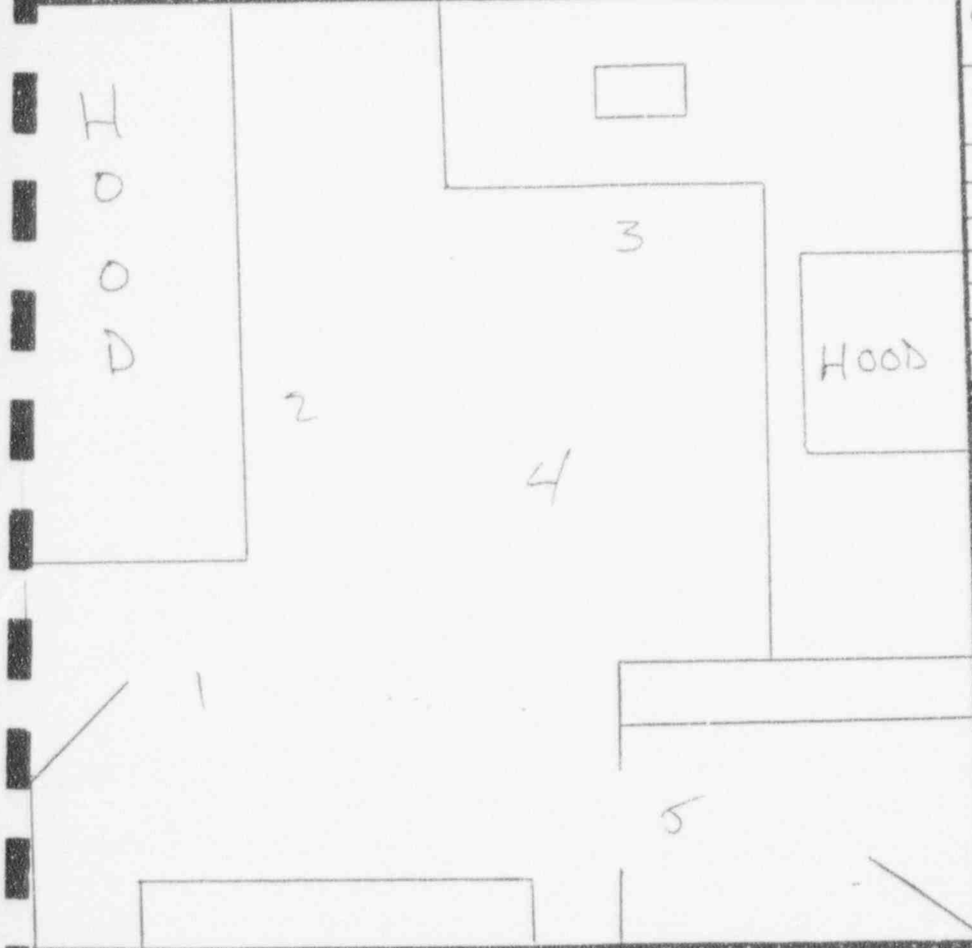
COMPANY NAME FDA

RADIATION SAFETY SURVEY

BLDG CVM

ROOM NO. 103

AUTHORIZED INVESTIGATOR	NAME (last, first initial) Myers, M.	PHONE NO.	DATE (month, day, year) 6-30-92
SURVEYOR	NAME (last, first initial) Watts, C	PHONE NO.	SURVEY METER USED L3w 44-3



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
✓		(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 coats
✓		(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
✓		(21) Corridor storage meets requirements
✓		(22) Radiation levels <2.5 mR/hr
✓		(23) Contamination (smears) < 100 dpm
✓		(24) Calibration current
✓		(25) Survey meters operational
✓		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

METER 1	METER 2	METER 3

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 3H	<100	→								
NUCLIDE 2 125I	<100	→								
NUCLIDE 3										

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

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ECOLOGY SERVICES, INC.
300 Second St., Laurel, Maryland 20707
(301) 498-1514

Company Name: FDA

RADIATION SAFETY SURVEY

Building / Room: MOD 1 / 2319

Authorized Investigator: NAME: (BASELINE SURVEY)

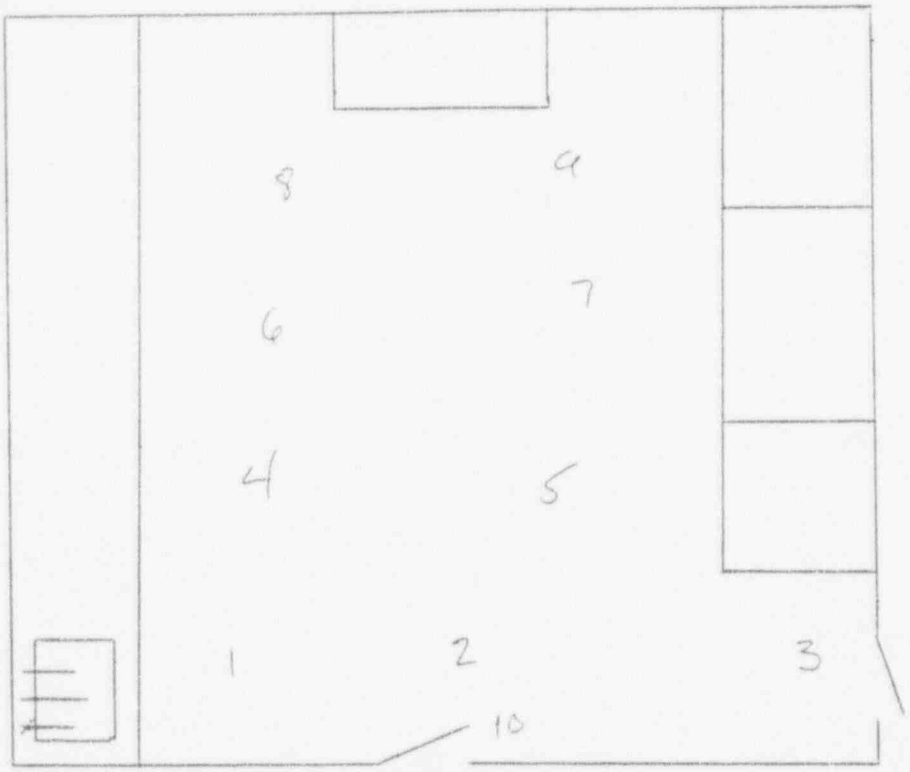
Phone No.

Date: 6-24-92

Surveyor: NAME: WATTS, C

Phone No.

Survey Meter Used: L3 w/ 44-9



Wipe Sample Results:

LOCATION:	1	2	3	4	5	6	7	8	9	10
Nuclide 1 3	<100									→
Nuclide 2										
Nuclide 3										
Nuclide 4										

Note: All wipe sample results are in units of DPM / 100 sq. cm.

Comments:

Compliance Items: Y - Compliance
N - Non-Compliance
Blank - Not Evaluated

Y N
☐ ☐

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, etc.
- ☑ ☐ Inventory & Disposal Records
- ☑ ☐ Survey Records Current
- ☑ ☐ Personnel Trained
- ☑ ☐ Prohibition on Mouth Pipetting
- ☑ ☐ Radiation Levels
- ☑ ☐ Contamination (Wipes) < 100 DPM/100 sq. cm.

Survey Instrument:

- ☐ ☐ Calibration Current
- ☐ ☐ Operational
- ☐ ☐ Available
- ☐ ☐ Other (Specify in Comments)

ESI Form HPS.1 Rev 1.0 1/92

ECOLOGY SERVICES, INC.
Data Processing
REPORT OF SAMPLE ANALYSIS

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

DATE: 06-24-92 BY: ELW

NR	SAMPLE ID	GROSS CT	CT TIME	EFF	DPM	UCI
1	#1	38	1.00	0.30	< MDA	< MDA
2	#2	36	1.00	0.30	< MDA	< MDA
3	#3	26	1.00	0.31	< MDA	< MDA
4	#4	40	1.00	0.30	< MDA	< MDA
5	#5	33	1.00	0.30	< MDA	< MDA
6	#6	40	1.00	0.31	< MDA	< MDA
7	#7	40	1.00	0.30	< MDA	< MDA
8	#8	34	1.00	0.31	< MDA	< MDA
9	#9	37	1.00	0.30	< MDA	< MDA
10	#10	48	1.00	0.30	< MDA	< MDA

****

COUNTER: Beckman Model LS 1000 DETECTOR: LSC

BACKGROUND DATA: 34.00 (+- 35.6%) CPM

EFFICIENCY DATA:
MEAN EFFICIENCY: 0.30+-(5.0%)

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

PRECISION OF MEASUREMENTS: 95% CONFIDENCE LEVEL

HEALTH PHYSICI

ECOLOGY SERVICES, INC.
300 Second St., Laurel, Maryland 20707
(301) 498-1514

Company Name: FDA

RADIATION SAFETY SURVEY

Building / Room: MOD 1 / 2317

Authorized Investigator: NAME:

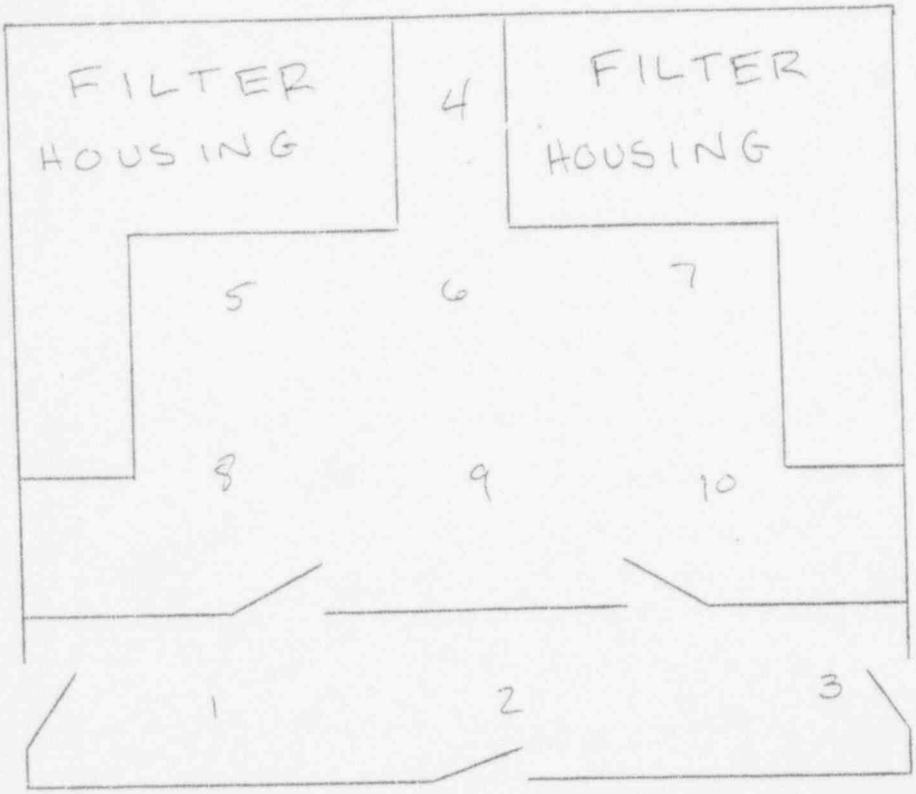
Phone No.

Date: 6-24-92

Surveyor: NAME: WATTS, C

Phone No.

Survey Meter Used: L3w 44-9



Compliance Items: Y - Compliance
Y N
☐ ☐
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
☑ ☐ Adequate use of Shielding
☑ ☐ Prohibition of eating, drinking, etc.
☑ ☐ Inventory & Disposal Records
☑ ☐ Survey Records Current
☑ ☐ Personnel Trained
☑ ☐ Prohibition on Mouth Pipetting
☑ ☐ Radiation Levels
☑ ☐ Contamination (Wipes) < 100 DPM/100 sq. cm.

Survey Instrument:
☐ ☐ Calibration Current
☐ ☐ Operational
☐ ☐ Available
☐ ☐ Other (Specify in Comments)

Wipe Sample Results:

LOCATION:	1	2	3	4	5	6	7	8	9	10
Nuclide 1 β	<100	—	—	—	—	—	—	—	—	→
Nuclide 2										
Nuclide 3										
Nuclide 4										

Note: All wipe sample results are in units of DPM / 100 sq. cm.

Comments:

ESI Form HPS.1 Rev 1.0 1/92

ECOLOGY SERVICES, INC.
Data Processing

REPORT OF SAMPLE ANALYSIS

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

DATE: 06-24-92 BY: ELW

NR	SAMPLE ID	GROSS CT	CT TIME	EFF	DPM	UCI
1	#1	40	1.00	0.29	< MDA	< MDA
2	#2	45	1.00	0.29	< MDA	< MDA
3	#3	24	1.00	0.29	< MDA	< MDA
4	#4	28	1.00	0.29	< MDA	< MDA
5	#5	38	1.00	0.29	< MDA	< MDA
6	#6	39	1.00	0.30	< MDA	< MDA
7	#7	33	1.00	0.29	< MDA	< MDA
8	#8	33	1.00	0.29	< MDA	< MDA
9	#9	38	1.00	0.30	< MDA	< MDA
10	#10	37	1.00	0.29	< 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 95 DPM 4.28E-05 UCI

PRECISION OF MEASUREMENTS: 95% CONFIDENCE LEVEL

HEALTH PHYSICIST ____________________

ECOLOGY SERVICES, INC.

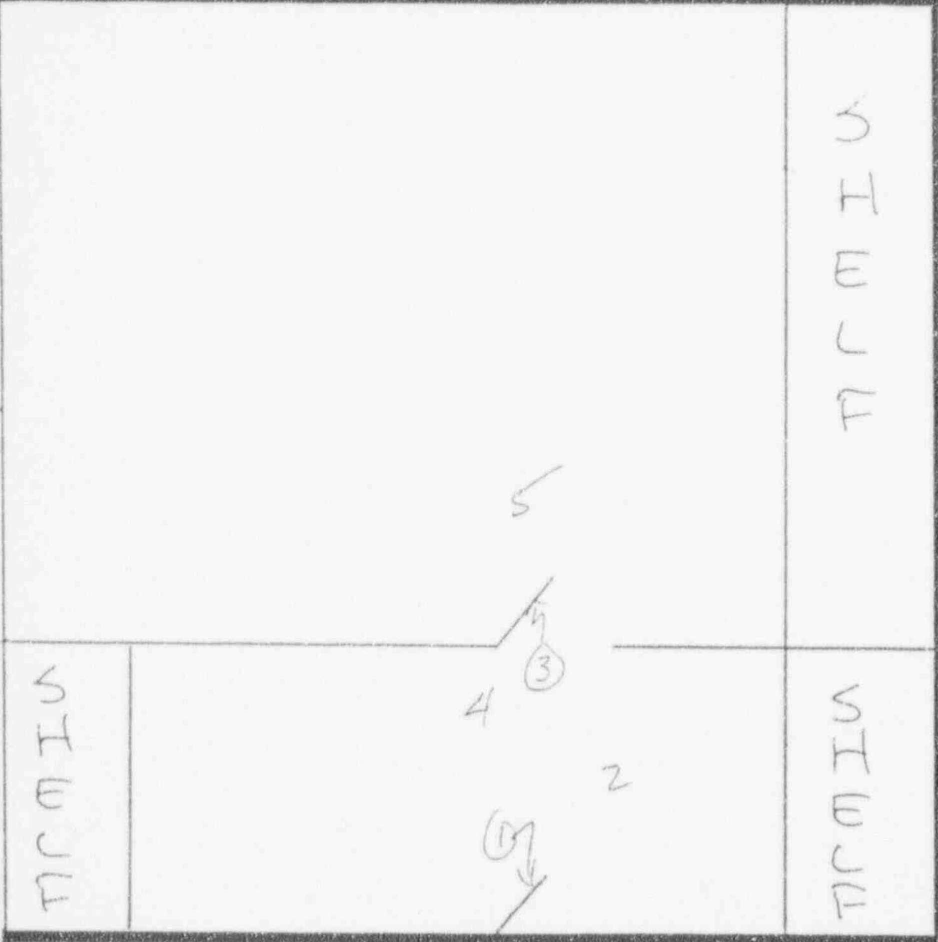
COMPANY NAME FDA

RADIATION SAFETY SURVEY

BLDG. BRF

ROOM NO. Walk In Cold Rms

AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE NO.	DATE (month, day, year) 6-30-92
SURVEYOR	NAME (last, first initial) Watts, C	PHONE NO.	SURVEY METER USED L3 w/ 44-9



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
✓		(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 coats
		(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
		(21) Corridor storage meets requirements
✓		(22) Radiation levels <2.5 mR/hr
✓		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

METER 1	METER 2	METER 3

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 P	<100	→								
NUCLIDE 2										
NUCLIDE 3										

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

Rev. Oct 1990

ECOLOGY SERVICES, INC.

RADIATION SAFETY SURVEY

COMPANY NAME FDA

BLDG BRF

ROOM NO. LOADING Dock

AUTHORIZED INVESTIGATOR NAME (last, first initial)

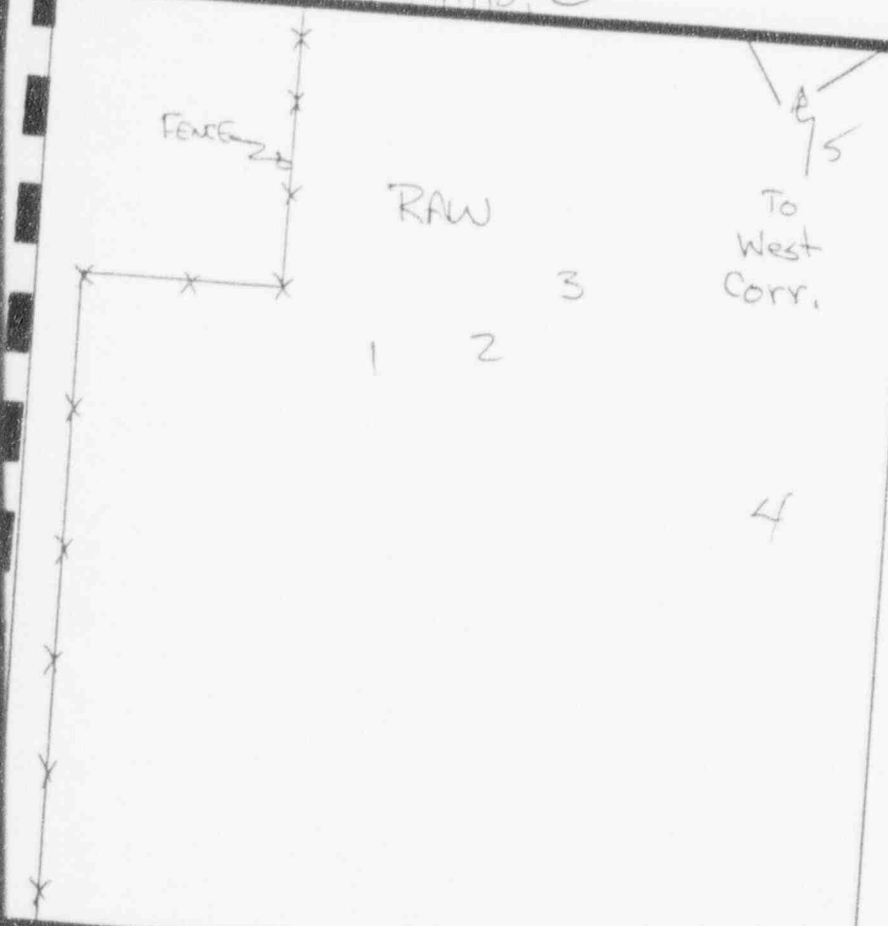
PHONE NO.

DATE (month, day, year) 6-30-92

SURVEYOR NAME (last, first initial) WATTS, C

PHONE NO.

SURVEY METER USED L3 w/ 44-9



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
		(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 coats
		(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
		(21) Corridor storage meets requirements
✓		(22) Radiation levels <2.5 mR/hr
✓		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

METER 1	METER 2	METER 3

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

OCATION	1	2	3	4	5	6	7	8	9	10
UCLIDE 1 B	<100	→	→	→	→					
UCLIDE 2										
CLIDE 3										

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

Rev. Oct 1990

ECOLOGY SERVICES, INC.

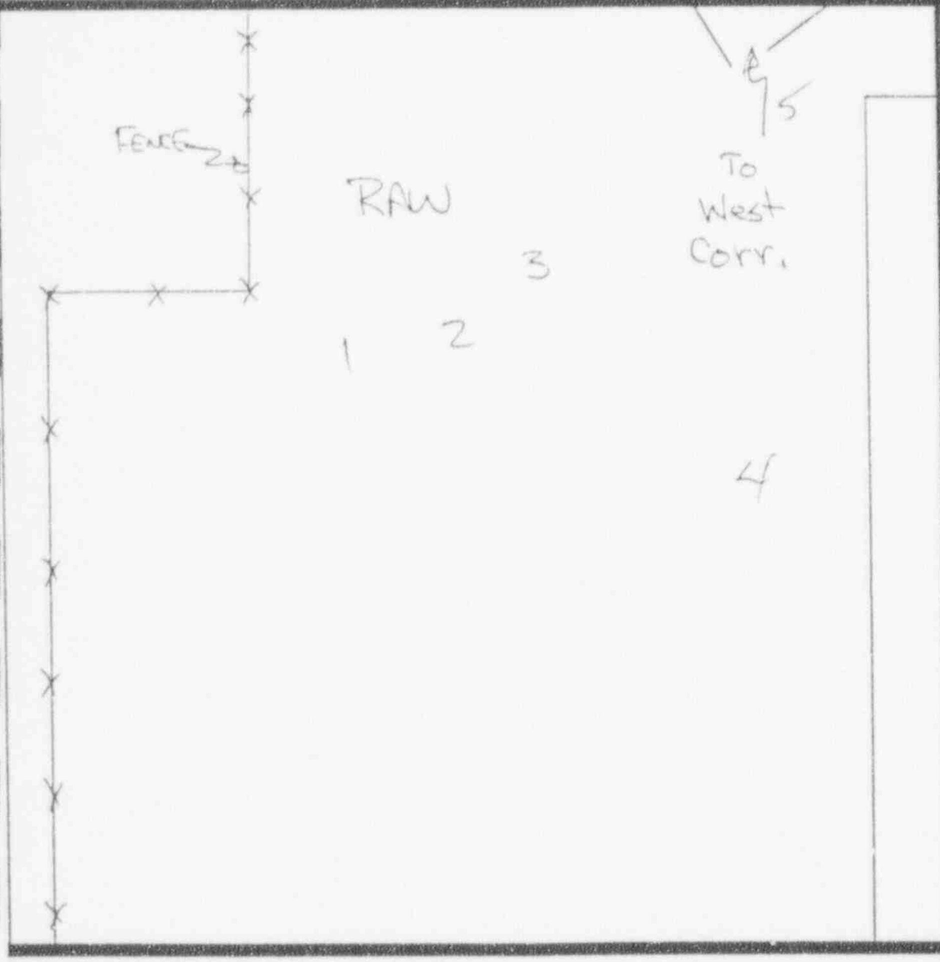
COMPANY NAME FDA

RADIATION SAFETY SURVEY

BLDG. BRF

ROOM NO. LOADING Dock

AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE NO.	DATE (month, day, year) 6-30-92
SURVEYOR	NAME (last, first initial) WATTS, C	PHONE NO.	SURVEY METER USED L3 w/ 44-9



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
		(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 coats
		(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
		(21) Corridor storage meets requirements
✓		(22) Radiation levels < 2.5 mR/hr
✓		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 β	<100	——→								
NUCLIDE 2										
NUCLIDE 3										

METER 1	METER 2	METER 3

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

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ECOLOGY SERVICES, INC.

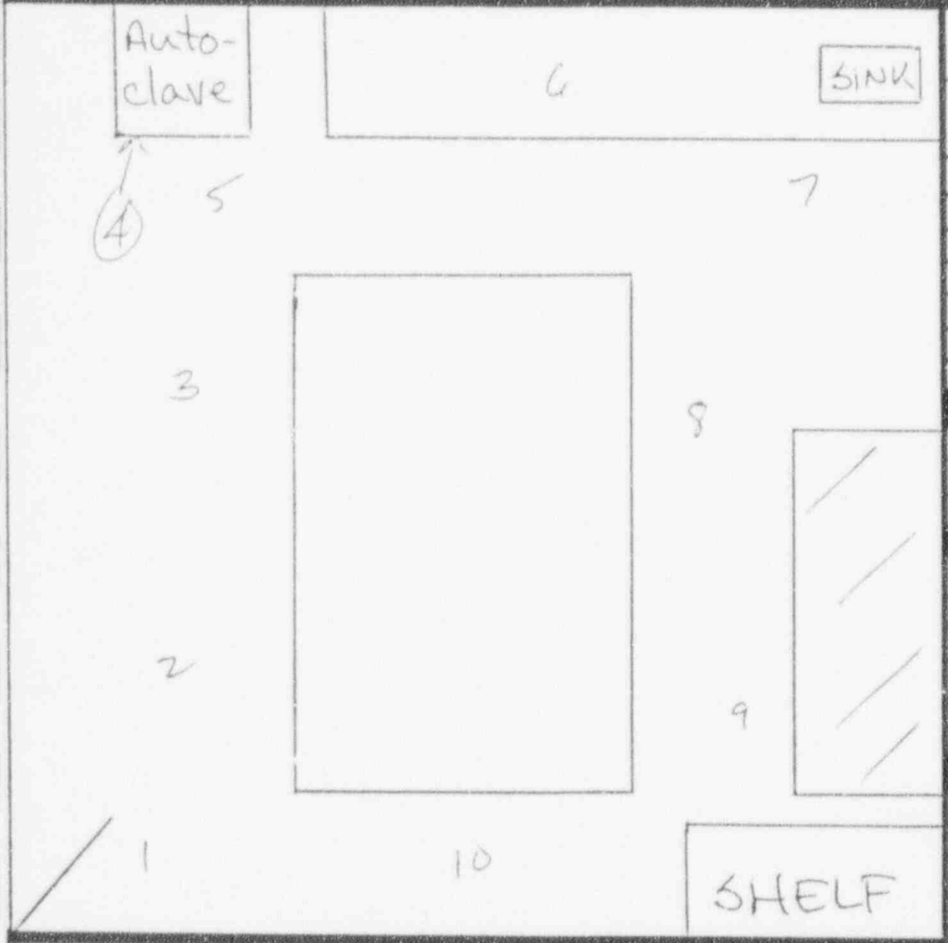
COMPANY NAME FDA

RADIATION SAFETY SURVEY

BLDG BRF

ROOM NO. 6

AUTHORIZED INVESTIGATOR	NAME (last, first initial) SAPIENZA, P	PHONE NO.	DATE (month, day, year) 6-30-92
SURVEYOR	NAME (last, first initial) WATTS C	PHONE NO.	SURVEY METER USED L3 w/ 44-9



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
✓		(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 coats
		(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
		(21) Corridor storage meets requirements
✓		(22) Radiation levels <2.5 mR/hr
✓		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

METER 1	METER 2	METER 3

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 β	<100									→
NUCLIDE 2										
NUCLIDE 3										

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

Rev. Oct 1990

ECOLOGY SERVICES, INC.

COMPANY NAME FDA

RADIATION SAFETY SURVEY

BLDG BRF

ROOM NO. 14

AUTHORIZED INVESTIGATOR NAME (last, first initial) SAPIENZA, P.

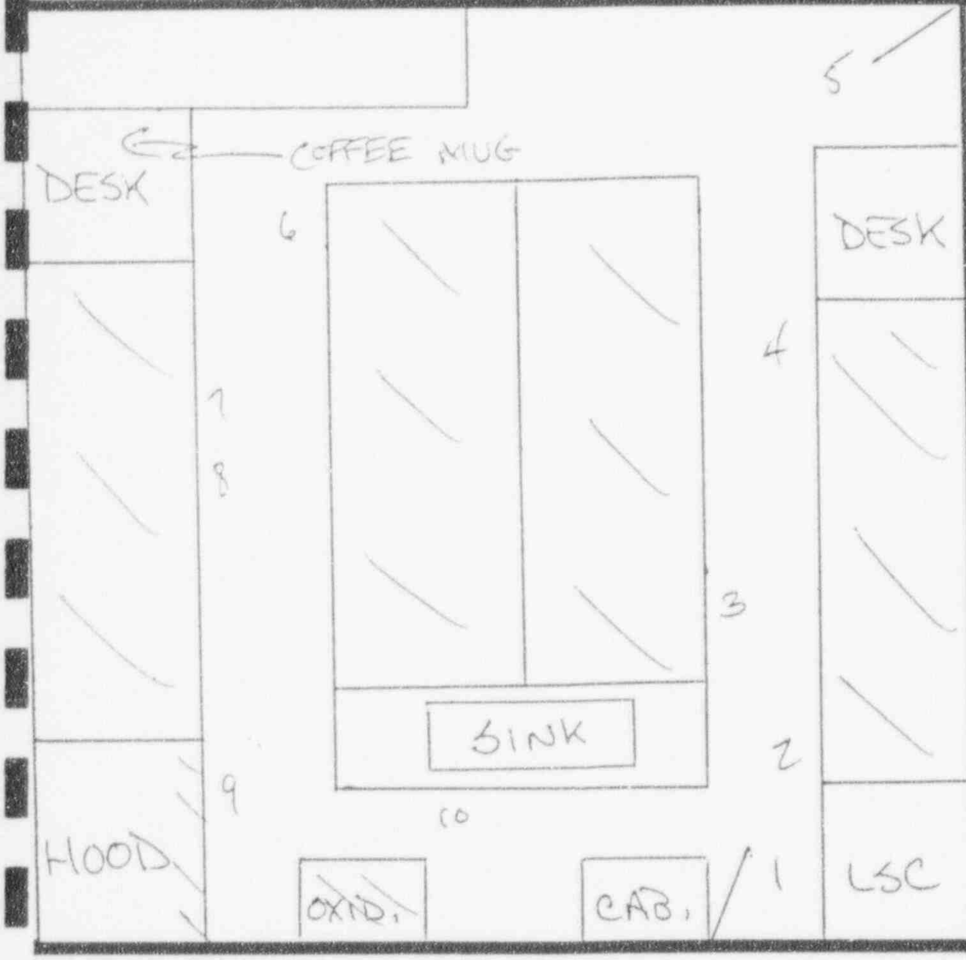
PHONE NO.

DATE (month, day, year) 6-30-92

SURVEYOR NAME (last, first initial) WATTS C

PHONE NO.

SURVEY METER USED 13 w/ 44-9



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
✓		(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 coats
		(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
✓		(21) Corridor storage meets requirements
✓		(22) Radiation levels < 2.5 mR/hr
✓		(23) Contamination (smears) < 100 dpm
✓		(24) Calibration current
✓		(25) Survey meters operational
✓		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

METER 1	METER 2	METER 3

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 β	<100									→
NUCLIDE 2										
NUCLIDE 3										

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

16.) Coffee mug on desk

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ECOLOGY SERVICES, INC.

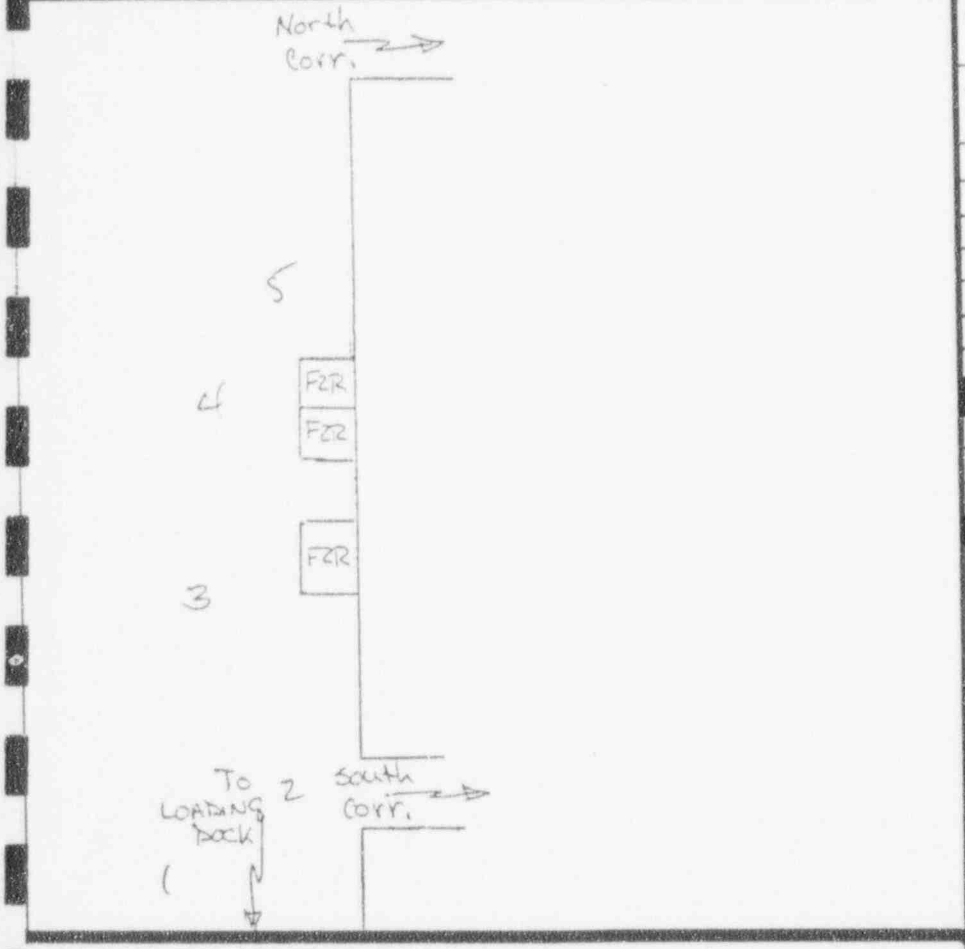
COMPANY NAME FDA

RADIATION SAFETY SURVEY

BLDG BRF

ROOM NO. West Corr.

	NAME (last, first initial)	PHONE NO.	DATE (month, day, year)
AUTHORIZED INVESTIGATOR			6-30-92
	NAME (last, first initial)	**PHONE NO.**	**SURVEY METER USED**
SURVEYOR	Watts, C		L3 w/ 44-9



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
		(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 coats
		(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
✓		(21) Corridor storage meets requirements
		(22) Radiation levels <2.5 mR/hr
✓		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 P	<100	→								
NUCLIDE 2										
NUCLIDE 3										

METER 1	METER 2	METER 3

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

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ECOLOGY SERVICES, INC.

COMPANY NAME FDA

RADIATION SAFETY SURVEY

BLDG BRF

ROOM NO North Corr.

AUTHORIZED INVESTIGATOR NAME (last, first initial)

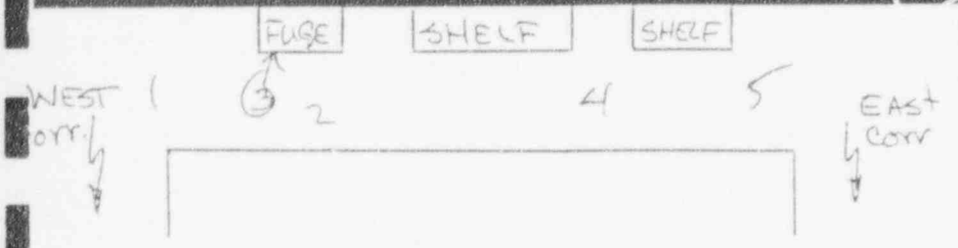
PHONE NO.

DATE (month, day, year) 6-30-92

SURVEYOR NAME (last, first initial) WATTS, C

PHONE NO.

SURVEY METER USED L3 w/ 44-9



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
		(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 coats
		(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
✓		(21) Corridor storage meets requirements
		(22) Radiation levels < 2.5 mR/hr
✓		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 β	<100		→							
NUCLIDE 2										
NUCLIDE 3										

METER 1	METER 2	METER 3

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

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ECOLOGY SERVICES, INC.

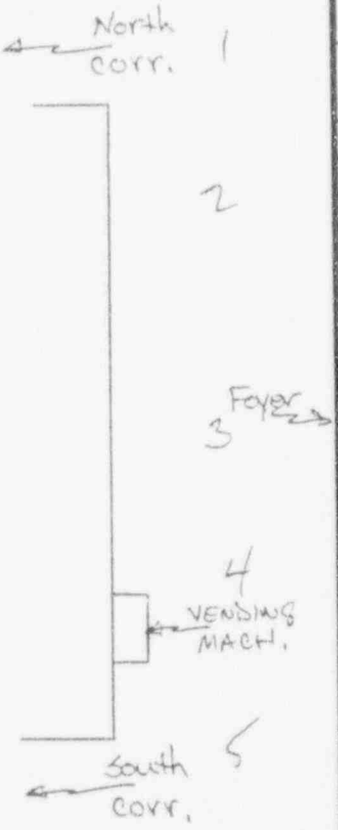
COMPANY NAME FDA

RADIATION SAFETY SURVEY

BLDG BRF

ROOM NO East Corr.

AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE NO.	DATE (month, day, year) 6-30-92
SURVEYOR	NAME (last, first initial) WATTS, C	PHONE NO.	SURVEY METER USED L3 w/ 44-9



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
		(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 coats
		(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
✓		(21) Corridor storage meets requirements
		(22) Radiation levels <2.5 mR/hr
✓		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

METER 1	METER 2	METER 3

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 β	<100		→	→	→					
NUCLIDE 2										
NUCLIDE 3										

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

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ECOLOGY SERVICES, INC.

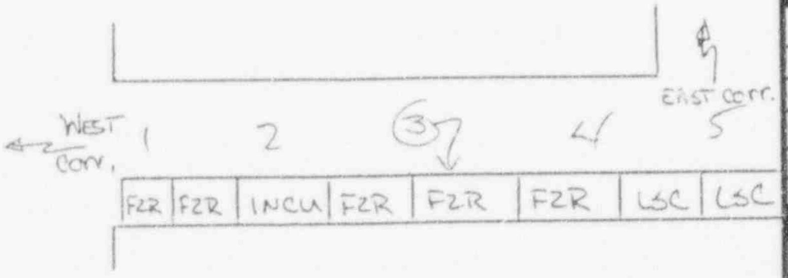
RADIATION SAFETY SURVEY

COMPANY NAME FDA

BLDG BRF

ROOM NO South Corr.

AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE NO.	DATE (month, day, year) 6-30-96
SURVEYOR	NAME (last, first initial) WATTS C	PHONE NO.	SURVEY METER USED L3 w/ 44-9



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
		(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 coats
		(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
✓		(21) Corridor storage meets requirements
		(22) Radiation levels <2.5 mR/hr
✓		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 P	<100	———→								
NUCLIDE 2										
NUCLIDE 3										

METER 1	METER 2	METER 3

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

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ECOLOGY SERVICES, INC.

COMPANY NAME FDA

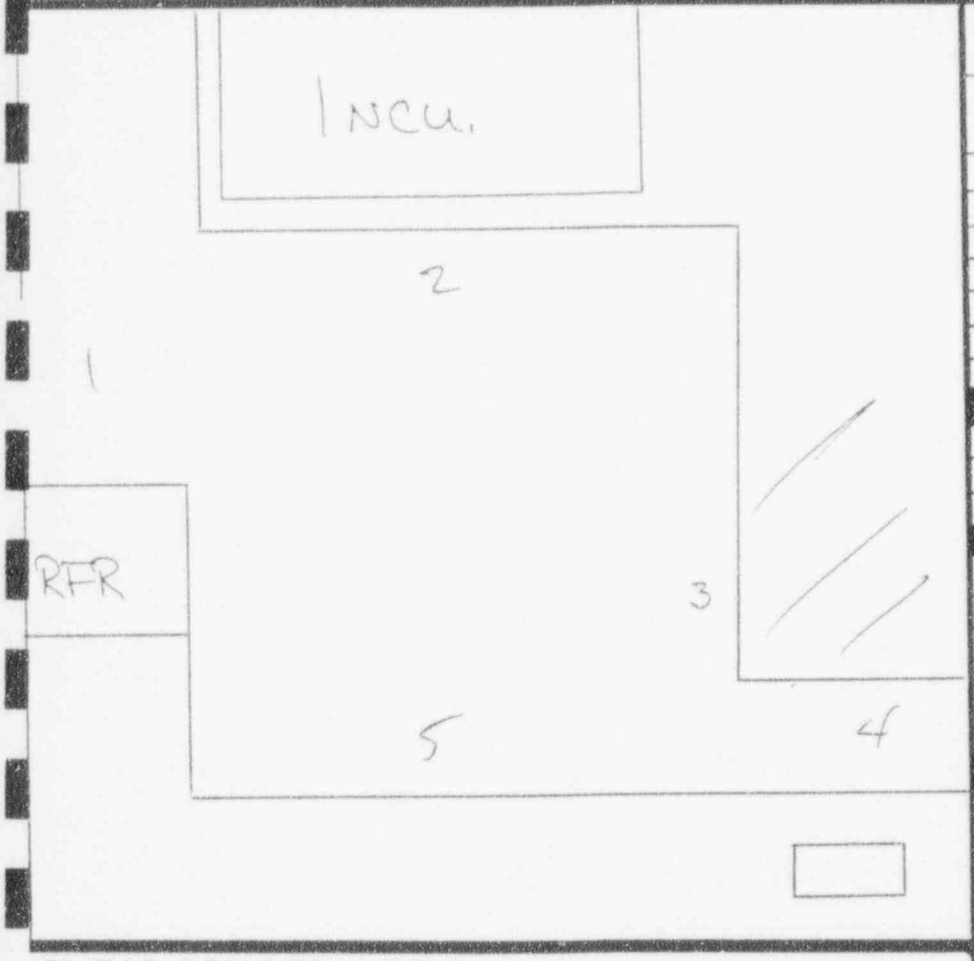
RADIATION SAFETY SURVEY

BLDG CVM

ROOM NO. 105

AUTHORIZED INVESTIGATOR — NAME (last, first initial) Myers, M. — PHONE NO. — DATE (month, day, year) 6-30-92

SURVEYOR — NAME (last, first initial) Watts, C — PHONE NO. — SURVEY METER USED L3 w/ 44-3



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
✓		(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 coats
✓		(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
✓		(21) Corridor storage meets requirements
✓		(22) Radiation levels < 2.5 mR/hr
✓		(23) Contamination (smears) < 100 dpm
✓		(24) Calibration current
✓		(25) Survey meters operational
✓		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 3H	<100	————	————	————	→					
NUCLIDE 2 125I	<100	————	————	————	→					
NUCLIDE 3										

METER 1	METER 2	METER 3

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

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ECOLOGY SERVICES, INC.

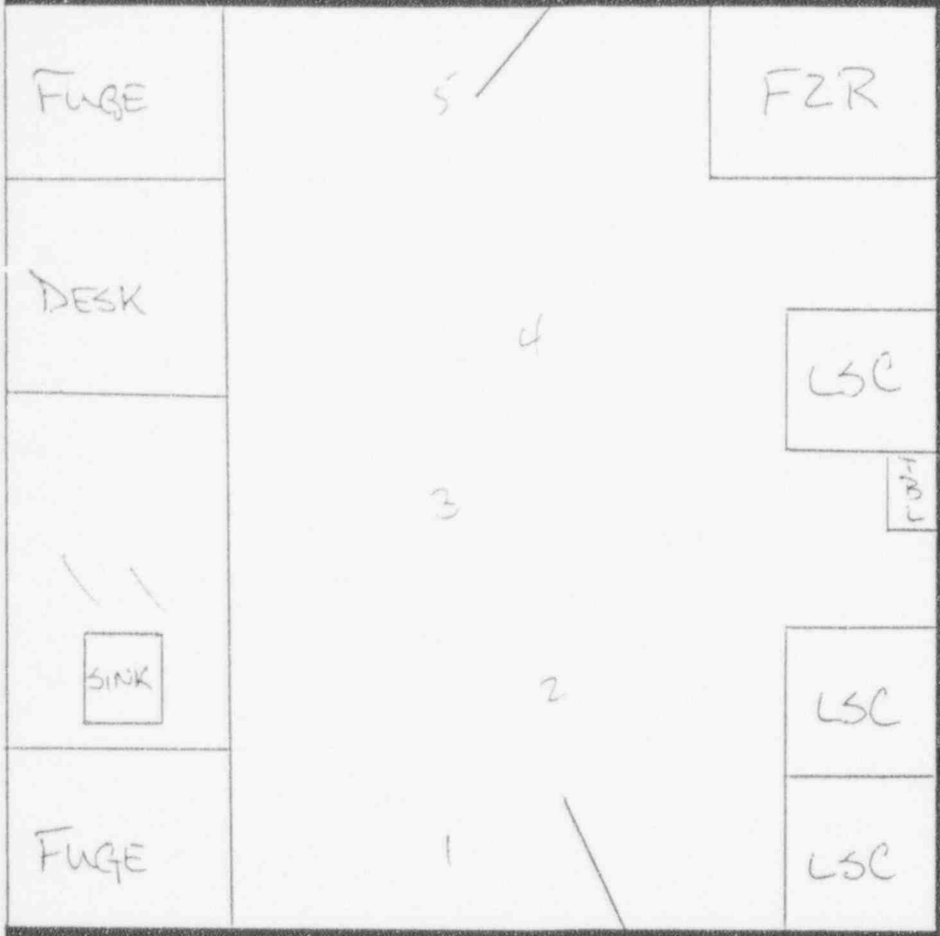
COMPANY NAME FDA

RADIATION SAFETY SURVEY

BLDG FB8

ROOM NO. 6448

AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE NO.	DATE (month, day, year) 6-23-92
SURVEYOR	NAME (last, first initial) Watts, C	PHONE NO.	SURVEY METER USED L3 w/ 44-9



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y N

(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 coats
(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
(21) Corridor storage meets requirements
(22) Radiation levels < 2.5 mR/hr
(23) Contamination (smears) < 100 dpm
(24) Calibration current
(25) Survey meters operational
(26) Survey meters available
(27) Other (SPECIFY IN REMARKS)

METER 1	METER 2	METER 3

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 P	<100	———	———	———	——→					
NUCLIDE 2										
NUCLIDE 3										

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

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ECOLOGY SERVICES, INC.

COMPANY NAME FDA

RADIATION SAFETY SURVEY

BLDG FB8

ROOM NO. 2266

AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE NO.	DATE (month, day, year) 6-23-92
SURVEYOR	NAME (last, first initial) WATTS, C	PHONE NO.	SURVEY METER USED N/A

COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
✓		(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 coats
✓		(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
✓		(21) Corridor storage meets requirements
✓		(22) Radiation levels < 2.5 mR/hr
✓		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 3H	<100	⟶								→
NUCLIDE 2										
NUCLIDE 3										

METER 1	METER 2	METER 3

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

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ECOLOGY SERVICES, INC.

COMPANY NAME FDA

RADIATION SAFETY SURVEY

BLDG FB8

ROOM NO. 6446

AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE NO.	DATE (month, day, year) 6-23-92
SURVEYOR	NAME (last, first initial) WATTS C	PHONE NO.	SURVEY METER USED 13 w/ 44-9

COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
/		(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 hocd flow
/		(9) Hood air flow in calibration
/		(10) Adequate personnel external monitoring
/		(11) Radioactive waste management
/	/	(12) Adequate radionuclide si rage
/	/	(13) Routine use of gloves
/		(14) Routine use of lab coats
/		(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
/		(21) Corridor storage meets requirements
/	/	(22) Radiation levels < 2.5 mR/hr
/		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

METER 1	METER 2	METER 3

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 P	<100	———								→
NUCLIDE 2										
NUCLIDE 3										

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

Rev. Oct 1990

ECOLOGY SERVICES, INC.

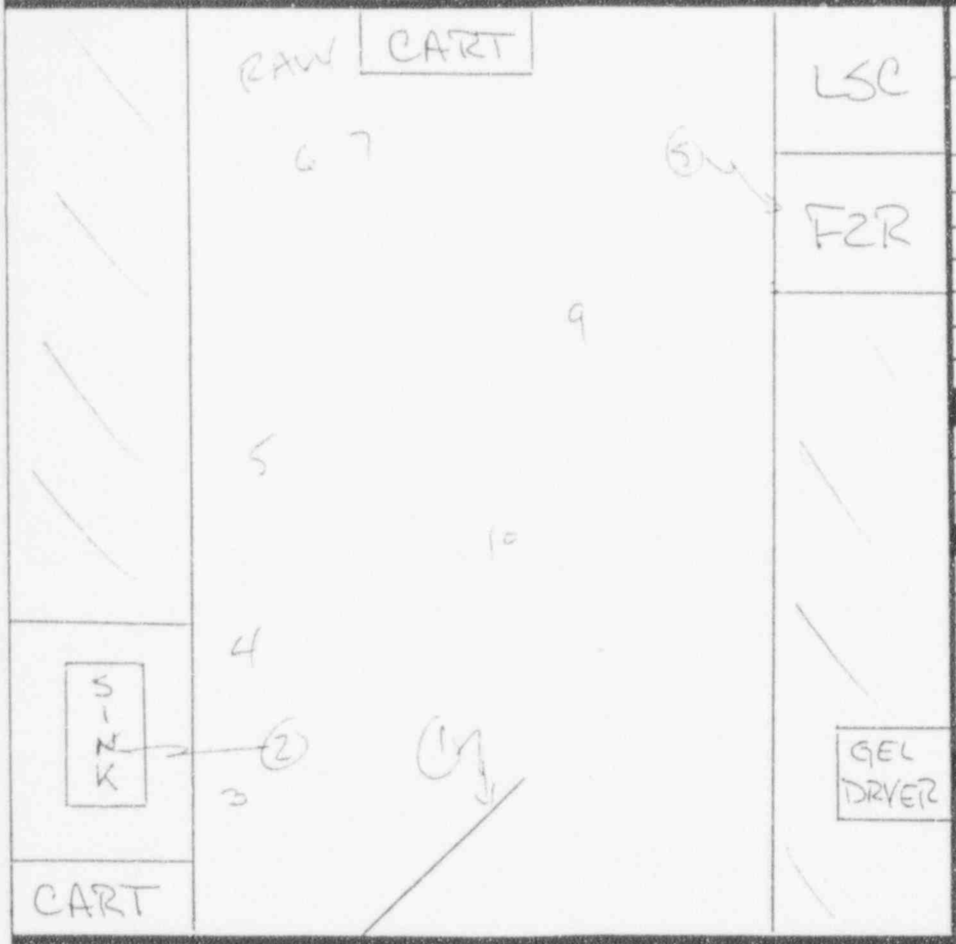
COMPANY NAME FDA

RADIATION SAFETY SURVEY

BLDG FB8

ROOM NO. 3756

AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE NO.	DATE (month, day, year) 6-23-92
SURVEYOR	NAME (last, first initial) Watts, C	PHONE NO.	SURVEY METER USED L3 w/ 44-9



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
✓		(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 coats
✓		(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
✓		(21) Corridor storage meets requirements
✓		(22) Radiation levels < 2.5 mR/hr
✓		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

METER 1	METER 2	METER 3

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 ³²P	<100 →									
NUCLIDE 2										
NUCLIDE 3										

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

Rev. Oct 1990

ECOLOGY SERVICES, INC.

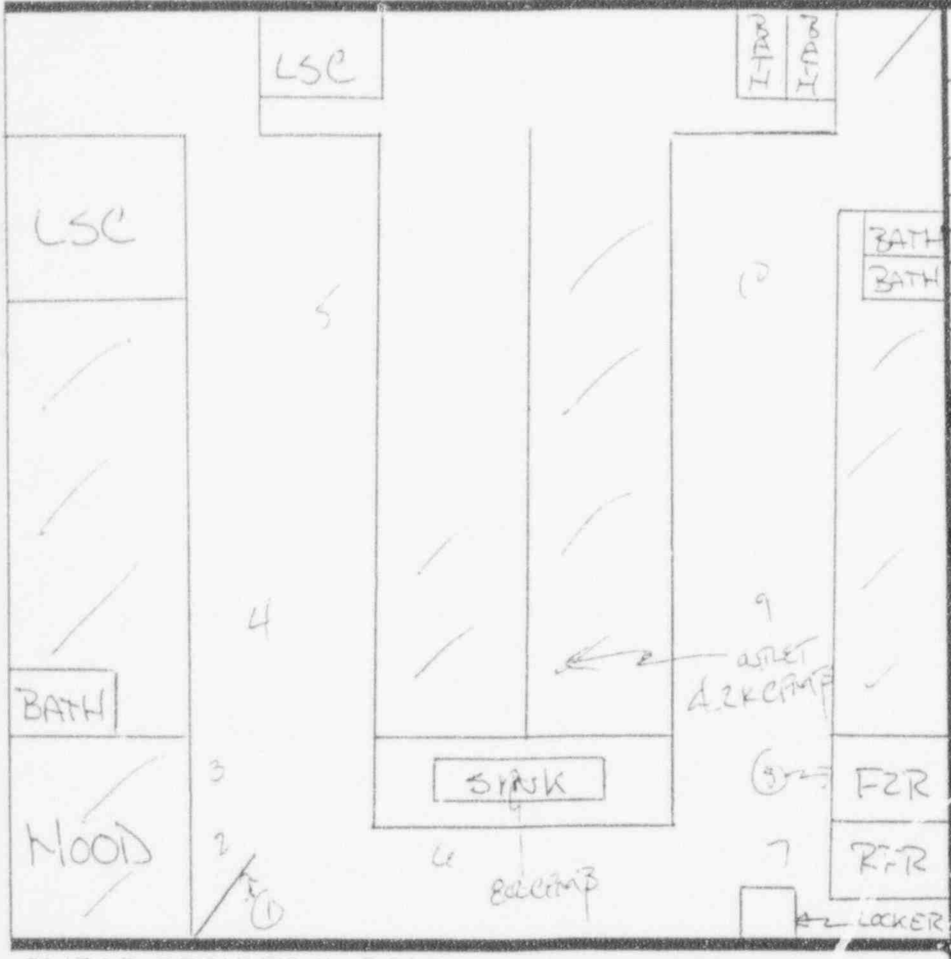
COMPANY NAME FDA

RADIATION SAFETY SURVEY

BLDG FB8

ROOM NO. 3838

AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE NO.	DATE (month, day, year) 6-23-92
SURVEYOR	NAME (last, first initial) WATTS C	PHONE NO.	SURVEY METER USED L3 w/ 44-9



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION	Y	N
(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 coats		
(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		
(21) Corridor storage meets requirements		
(22) Radiation levels < 2.5 mR/hr		
(23) Contamination (smears) < 100 dpm		
(24) Calibration current		
(25) Survey meters operational		
(26) Survey meters available		
(27) Other (SPECIFY IN REMARKS)		

METER 1	METER 2	METER 3

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1 P	<100	→								→
NUCLIDE 2										
NUCLIDE 3										

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

SINK CONTAMINATED; 2885 dpm/20 cm^2

OUTLET CONTAMINATED; 15,961 dpm/20 cm^2

Rev. Oct 1990

ECOLOGY SERVICES, INC.

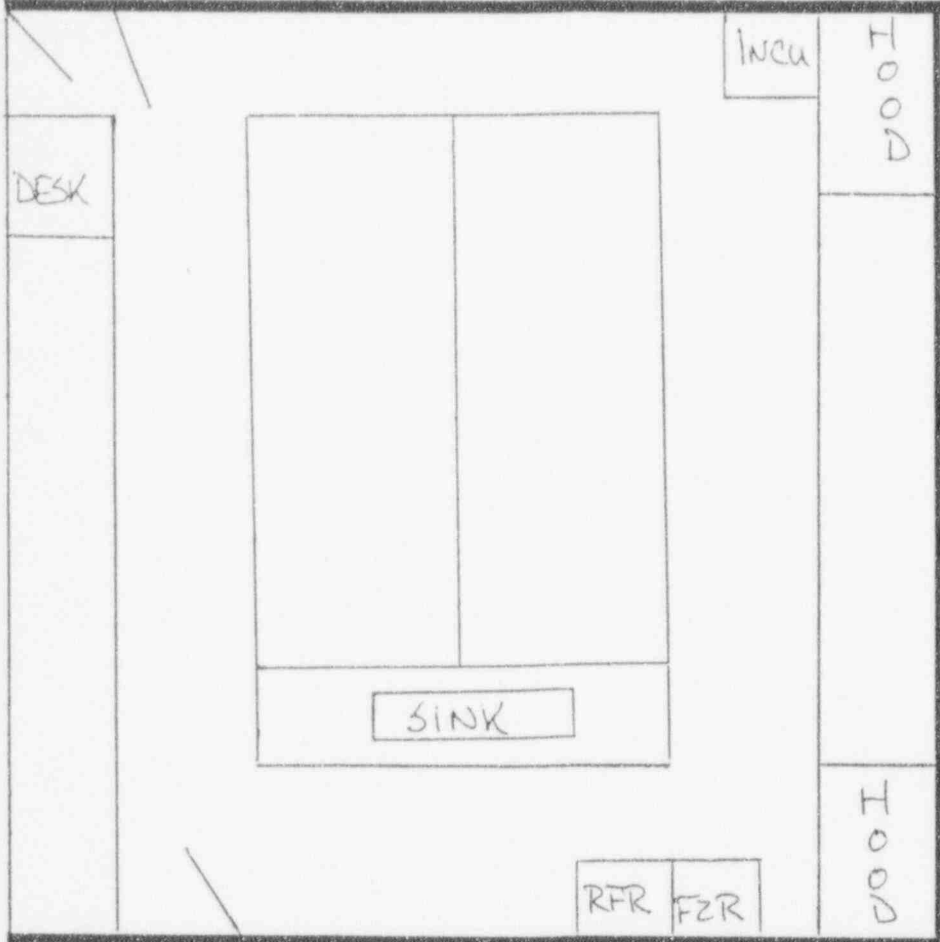
RADIATION SAFETY SURVEY

COMPANY NAME FDA

BLDG FB8

ROOM NO. 6846

AUTHORIZED INVESTIGATOR	NAME (last, first initial)	PHONE NO.	DATE (month, day, year) 6-23-96
SURVEYOR	NAME (last, first initial) Watts C	PHONE NO.	SURVEY METER USED



COMPLIANCE ITEMS Y=COMPLIANCE N=VIOLATION

Y	N	
		(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 coats
		(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
		(21) Corridor storage meets requirements
		(22) Radiation levels < 2.5 mR/hr
		(23) Contamination (smears) < 100 dpm
		(24) Calibration current
		(25) Survey meters operational
		(26) Survey meters available
		(27) Other (SPECIFY IN REMARKS)

METER 1	METER 2	METER 3

SMEAR RESULTS (in DPM) (fill in the nuclide(s) down the side of the table. All smears 100 cm^2)

LOCATION	1	2	3	4	5	6	7	8	9	10
NUCLIDE 1										
NUCLIDE 2										
NUCLIDE 3										

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

No RAM Use

Rev. Oct 1990

ATTACHMENT 3

DELEGATION OF AUTHORITY DOCUMENTS

POSITION DESCRIPTION

FDA ASSOCIATE COMMISSIONER FOR MANAGEMENT AND OPERATIONS

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 $260 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), National Technical Information Services activities (coordinates submission of FDA technical reports to NTIS, 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 SMG). 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

Ellen Rawlings
Delegations Officer

STAFF MANUAL GUIDE
FOOD AND DRUG ADMINISTRATION
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 MANAGEMENT AND OPERATIONS

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 PHS 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. Pending 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 superseded.

6. EFFECTIVE DATE. July 29, 1980.

Jere E Goyan
Commissioner of Food and Drugs

sanitation, shellfish sanitation, and poison control.

4. Functions under Executive Order 11001, section 3(f), and those portions of sections 3(b), 3(d), 3(e), 6, 7, 9, and 12 which relate to food, drugs, and biologicals. In the performance of these emergency functions the Commissioner shall coordinate his activities with the Administrator, Health Services and Mental Health Administration, in order that preemergency plans shall be developed in consonance with postattack organizational plans and structure of the Department for the Emergency Health Service.

5. Function of issuing all regulations of the Food and Drug Administration. The reservation of authority contained in Chapter 2-000 of the Department Organization Manual shall not apply.

6. Function of authorizing and approving miscellaneous and emergency expenses of enforcement activities, vested in the Secretary.

These authorities may be redelegated.

Pending issuance of redelegations, all delegations or redelegations to any other officer or employee of any office, institute, bureau, division, center, or other organization unit which were in effect immediately prior to the effective date of this redelegation shall continue in effect in them or their successors.

This redelegation becomes effective February 1, 1970.

Dated: December 18, 1969.

ROGER O. EGEBERG,
Assistant Secretary for Health and Scientific Affairs.

[F.R. Doc. 70-597; Filed, Jan. 15, 1970; 8:46 a.m.]

COMMISSIONER OF FOOD AND DRUGS

Redelegation by the Assistant Secretary for Administration

I hereby delegate to the Commissioner of Food and Drugs all the administrative management authorities currently delegated on a common basis to heads of operating agencies within the Department of Health, Education, and Welfare.

These authorities may be redelegated within the restrictions specified in pertinent Department manual instructions or other issuances.

Pending issuance of redelegations, all delegations or redelegations to any other officer or employee of any office, institute, bureau, division, center, or other organizational unit which were in effect immediately prior to the effective date of this redelegation shall continue in effect in them or their successors.

This redelegation becomes effective February 1, 1970.

Dated: December 23, 1969.

SOL ELSON,
Acting Deputy Assistant Secretary for Administration.

[F.R. Doc. 70-598; Filed, Jan. 15, 1970; 8:46 a.m.]

COMMISSIONER OF FOOD AND DRUGS

Redelegation by the Assistant Secretary, Comptroller

I hereby delegate to the Commissioner of Food and Drugs all the financial management authorities currently delegated on a common basis to heads of operating agencies within the Department of Health, Education, and Welfare.

These authorities may be redelegated within the restrictions specified in pertinent Department manual instructions or other issuances.

Pending issuance of redelegations, all delegations or redelegations to any other officer or employee of any office, institute, bureau, division, center or other organizational unit which were in effect immediately prior to the effective date of this redelegation shall continue in effect in them or their successors.

This redelegation becomes effective February 1, 1970.

Dated: December 24, 1969.

JAMES F. KELLY,
Assistant Secretary, Comptroller.

[F.R. Doc. 70-599; Filed, Jan. 15, 1970; 8:46 a.m.]

ATOMIC ENERGY COMMISSION

[Docket No. PRM-30-46]

MINNESOTA MINING AND MANUFACTURING CO.

Notice of Proposed Rule Making

Notice is hereby given that the Minnesota Mining and Manufacturing Co., General Offices, 3M Center, St. Paul, Minn., by letter dated December 29, 1969, has filed with the Commission a petition for rule making to amend the Commission's regulations, "General Licenses for Certain Quantities of Byproduct Material and Byproduct Material Contained in Certain Items," 10 CFR Part 31, and "Specific Licenses to Manufacture, Distribute, or Import Exempted and Generally Licensed Items Containing Byproduct Material," 10 CFR Part 32.

The petitioner requests that the Commission amend § 31.7(a) of Part 31 and § 32.53(e) of Part 32, which pertain to luminous safety devices for use in aircraft, to increase the maximum quantity of promethium-147 specified for luminous safety devices from 300 millicuries to 500 millicuries per device.

A copy of the petition for rule making is available for public inspection in the Commission's Public Document Room at 1717 H Street NW., Washington, D.C.

Dated at Germantown, Md., this 9th day of January 1970.

For the Atomic Energy Commission.

W. B. McCOOL,
Secretary.

[F.R. Doc. 70-577; Filed, Jan. 15, 1970; 8:45 a.m.]

CIVIL AERONAUTICS BOARD

[Docket 20411]

BOSTON-BUFFALO-CLEVELAND SUBPART M CASE

Notice of Oral Argument

Notice is hereby given, pursuant to the provisions of the Federal Aviation Act of 1958, as amended, that oral argument in the above-entitled case is assigned to be held on January 28, 1970, at 10 a.m. e.s.t., in Room 1027, Universal Building, 1825 Connecticut Avenue NW., Washington, D.C., before the Board.

Dated at Washington, D.C., January 12, 1970.

[SEAL]

THOMAS L. WRENN,
Chief Examiner.

[F.R. Doc. 70-568; Filed, Jan. 15, 1970; 8:45 a.m.]

[Docket 20938]

MINIMUM CHARGES PER SHIPMENT OF AIR FREIGHT

Notice of Hearing

Notice is hereby given, pursuant to the provisions of the Federal Aviation Act of 1958, as amended, that a hearing in the above-entitled proceeding will be held on February 3, 1970, at 10 a.m. (e.s.t.), in Room 911, Universal Building, 1825 Connecticut Avenue NW., Washington, D.C., before the undersigned Examiner.

For information concerning the issues involved and other details in this proceeding, interested persons are referred to the prehearing conference report served on July 11, 1969, and other documents which are in the docket of this proceeding on file in the Docket Section of the Civil Aeronautics Board.

Dated at Washington, D.C., January 12, 1970.

[SEAL]

THOMAS P. SHEEHAN,
Hearing Examiner.

[F.R. Doc. 70-569; Filed, Jan. 15, 1970; 8:45 a.m.]

FEDERAL COMMUNICATIONS COMMISSION

[Docket No. 18780; FCC 70-32]

LEISNER BROADCASTING CO.

Memorandum Opinion and Order Designating Application for Hearing on Stated Issues

In regard application of Leisner Broadcasting Corporation (WTHU), Thurmont, Md., has: 1450 kc., 100 w., U, Class IV, requests: 1450 kc., 250 w., 500 w.-LS, U, Class IV) for construction permit, Docket No. 18780, File No. BP-17908.

1. The Commission has before it for consideration (a) the above-captioned

TELEPHONE CONVERSATION LOG	DATE: January 13, 1994

PERSON CALLED:	ORGANIZATION:	TELEPHONE NUMBER:
Dr. Chawla, Safety Director Dore Watik, SIFSAN Safety Officer Don Thompson, FDA Safety Officer Jim Mckenna, Division Director	FDA HHS	Licensee Called
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.

SUMMARY:

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. This 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

SIGNATURE:

DATE: 1.14-94

TELEPHONE CONVERSA[illegible]ON LOG	DATE: D[illegible]mber 15, 1993

PERSON CALLING:	ORGANIZATION:	TELEPHONE NUMBER:
Arnold Borsetti Director/Office Management CFSA-FDA James Mckenna Director/Division of Management Services & Policy	Department of Health and Human Services Public Health Service Food & Drug Administration	(202) 205-4281
LICENSE NUMBER:	DOCKET NUMBER:	MAIL CONTROL NUMBER:
08-00482-03	030-03917	116499

PERSON CALLED:

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: Response to deficiensy letter dated Nov. 2, 1993 re: financial assurance for above license.

SUMMARY:

Explained that 3 of 6 questions (1, 4 & 6) were relatively uncomplicated. Since they are trying to retain the same contractor which prepared the initial DFP which raised 2 of the other 3 questions ((2 & 3), they some knowledge and should also be able to respond to these questions relatively quickly. The other question, (5) requires reviewing records of surveys for contamination over the past several years and this should also be fairly easy. All of these actions should be able to be accomplished within 4 weeks even given the holidays. I also noted that this action is already about 6 weeks old, 2 weeks past due. They stated that they would try to contact the contractor who already had a copy of the deficiency letter to determine if they could accomplish this task within 4 weeks. They tryed to request 6 weeks (until Jan 31) but I stated that this would require my management approval and they are possibly looking at escalated enforcement. They will respond within the next 2-3 days with their response from the contractor.

WILL COMMIT TO FINISHING BY 1/15

ACTION REQUIRED/TAKEN:

SIGNATURE:

DATE:

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

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

Michael S. Terpilak
Certified Health Physicist

cc: David Everhart

116499
DEC 13 1993

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 cm^2. 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 cm^2. Please confirm that you will use a removable contamination limit of 200 dpm/100 cm^2 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 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.

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.

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.

We will continue our review upon receipt of this information. Please reply in duplicate 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 Ullrich

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	DRSS:RI
Everhart	for Shanbaky
10/29/93	10/1/93

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

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.

116499 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

OFFICIAL RECORD COPY ML 10

116499

NOV 23 1992

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

Sincerely yours,

Ray L. Russo

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

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Food and Drug Administration
Rockville MD 20857

NOV 16 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

Sharon Smith Holston
Associate Commissioner
for Management
Food and Drug Administration

Enclosure

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116499

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
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October 30, 1992

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116499

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.

PART A

DECOMMISSIONING FUNDING PLAN

Department of Health and Human Services

Food and Drug Administration

September 30, 1992

Rev: Orig

List of Effective Pages

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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.

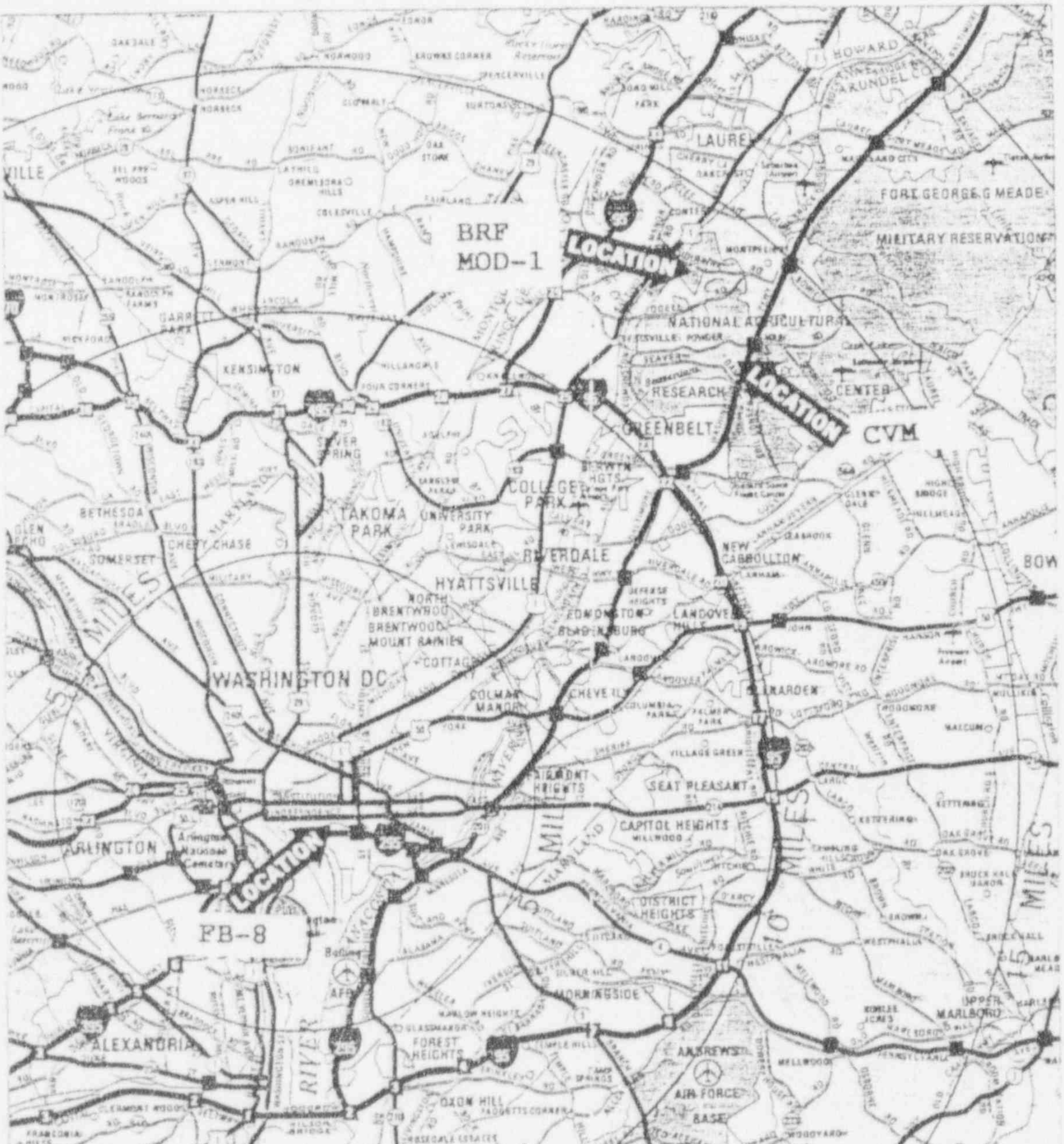
Decommissioning, as used in this report is defined the same as in 10 CFR 30.4, which states that "decommission" means to remove the facility safely from service and reduce residual radioactivity to a level that permits release of the property for unrestricted use and termination of the NRC license.

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.

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

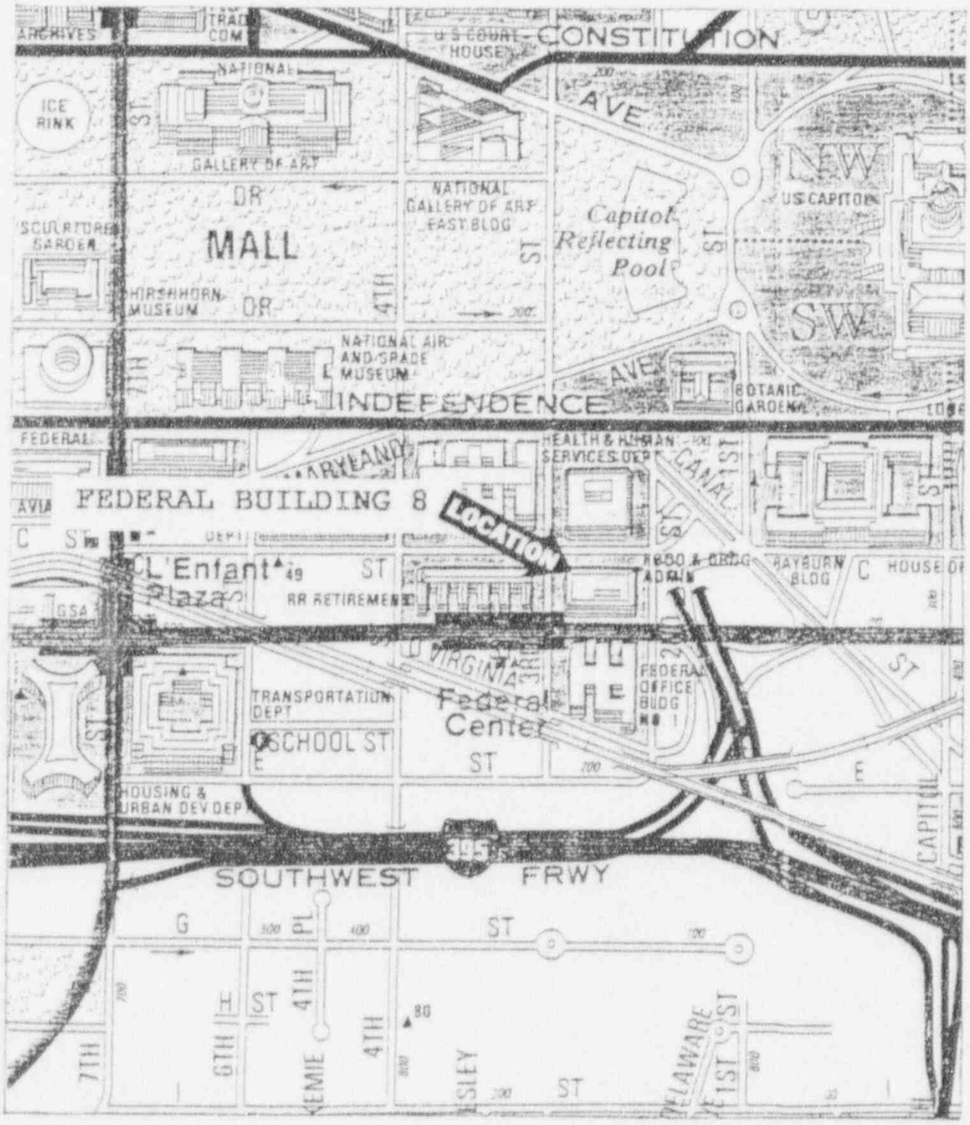


Figure 3
Federal Building 8

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[a]	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 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

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

[b] As used in this table, dpm (disintegrations per minute) means the rate of emission by radioactive material as determined by correcting the counts per minute observed by an appropriate detector for background, efficiency, and geometric factors associated with the instrumentation.

[c] 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.

[d] The maximum contamination level applies to an area of not more than 100 cm^2.

[e] The amount of removable radioactive material per 100 cm^2 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.

Source: NRC Regulatory Guide 1.86, Table 1, June 1974

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
Filters(Charcoal & HEPA)		X
Walls	X	
Floors	X	X
Ceiling Tiles		X
Miscellaneous Lab Equipment		X

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

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

[illegible]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

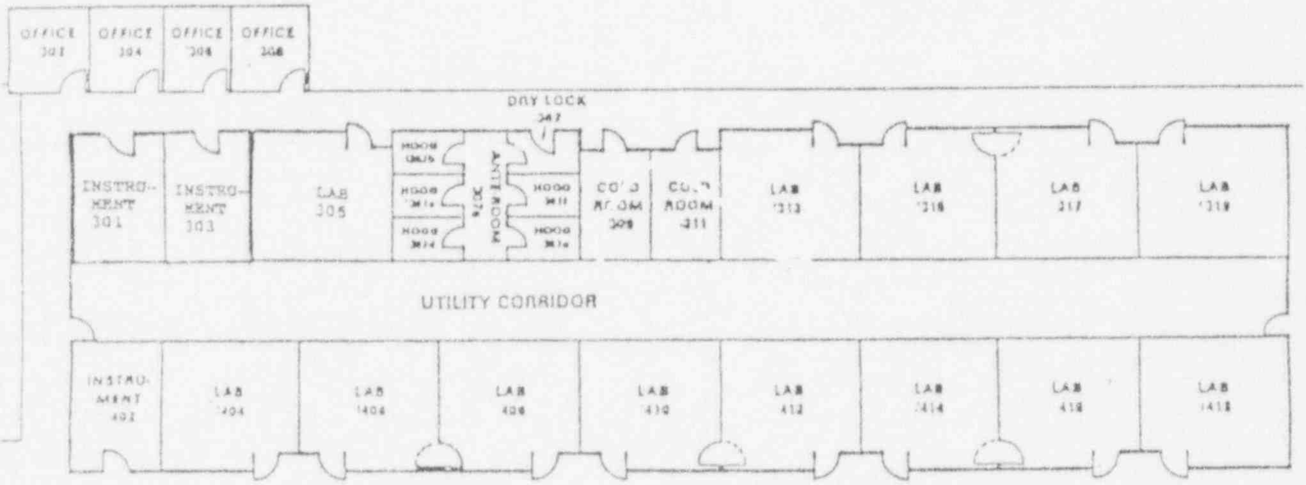


Figure 6
MOD 1 Second Floor Laboratories

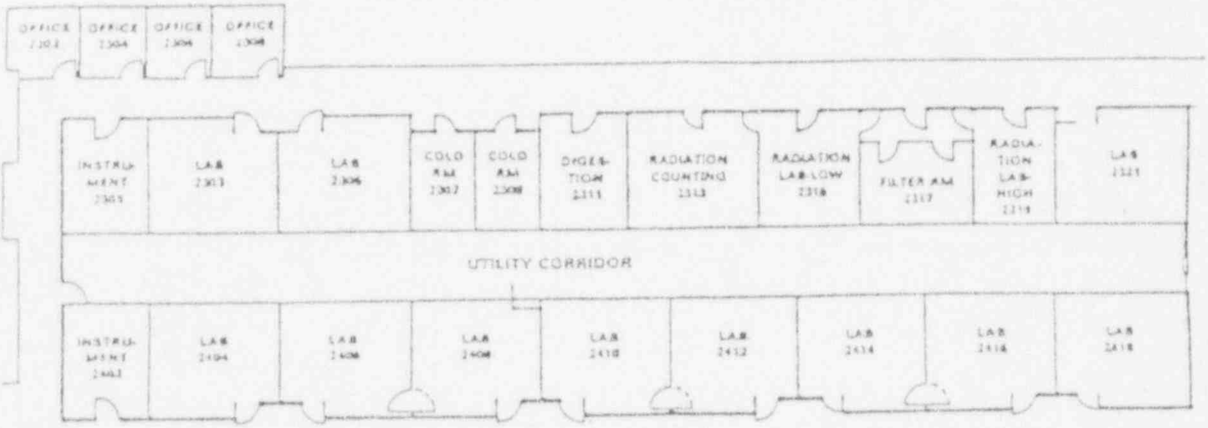
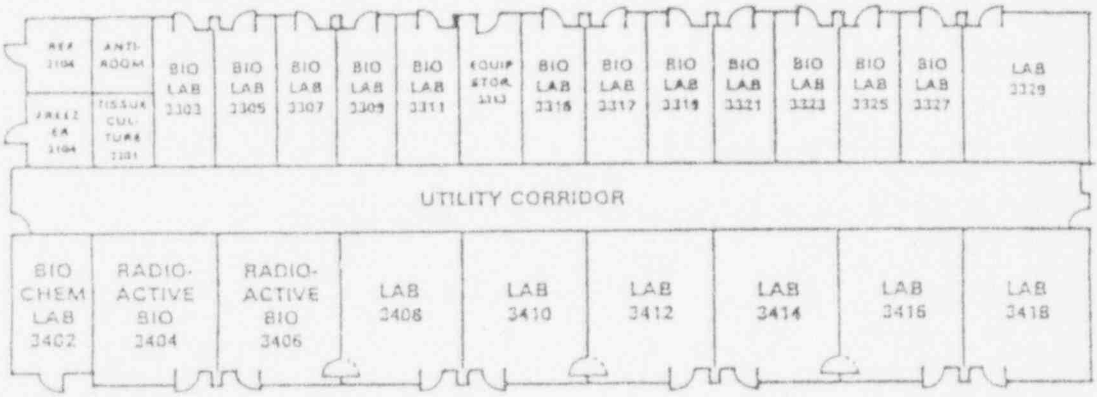


Figure 7
MOD 1 Third Floor Laboratories



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.

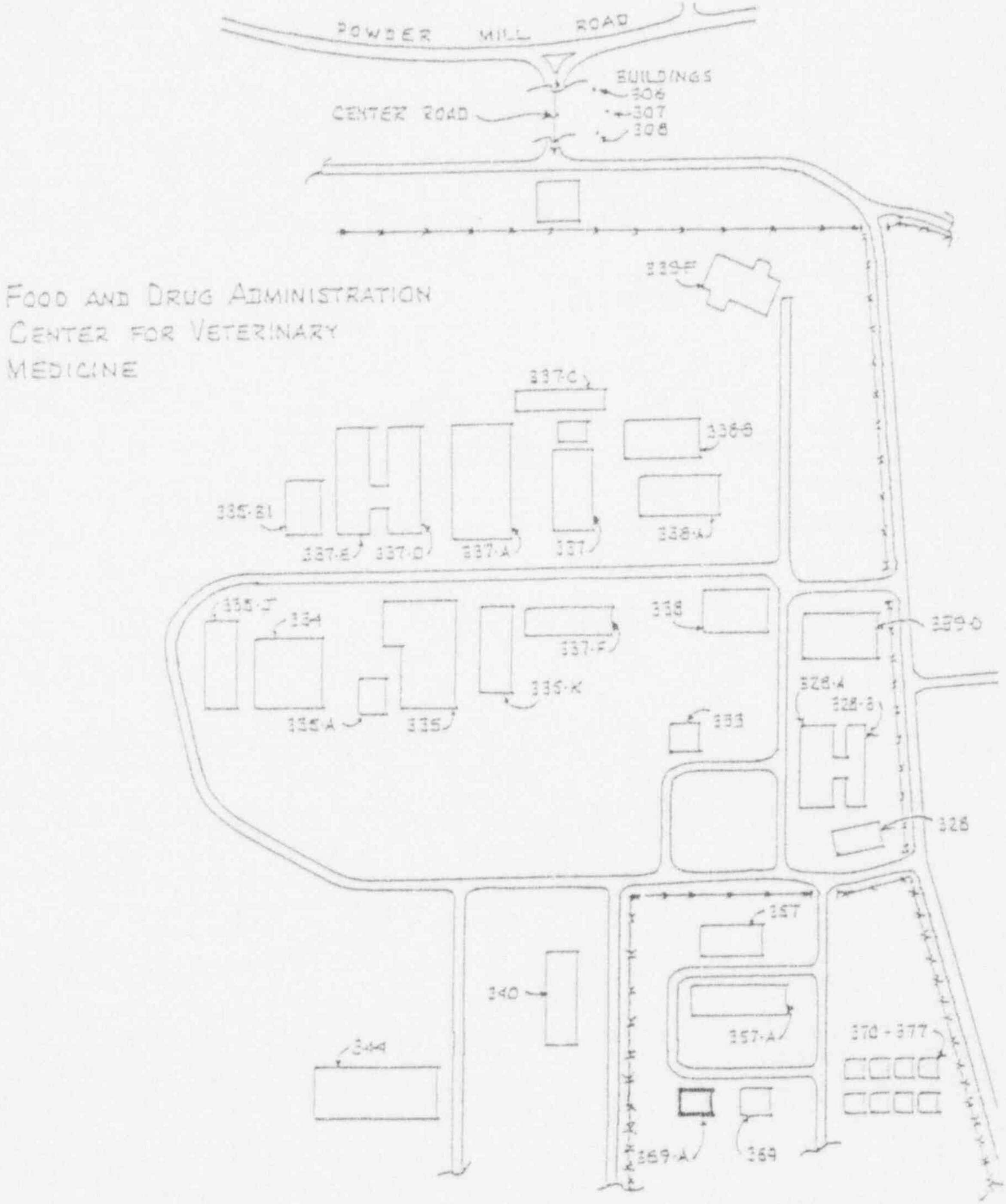
The off-gas ducts from the fume hoods used in the radioactive use laboratories all have bag-in/bag-out filter housings for charcoal filters. These stainless steel filter housings are assumed capable of successful decontamination. The filters will be disposed of as low-level radioactive waste. Swipes 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 open-air 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
335
339-F
344
357
334
339-D
337
338

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.

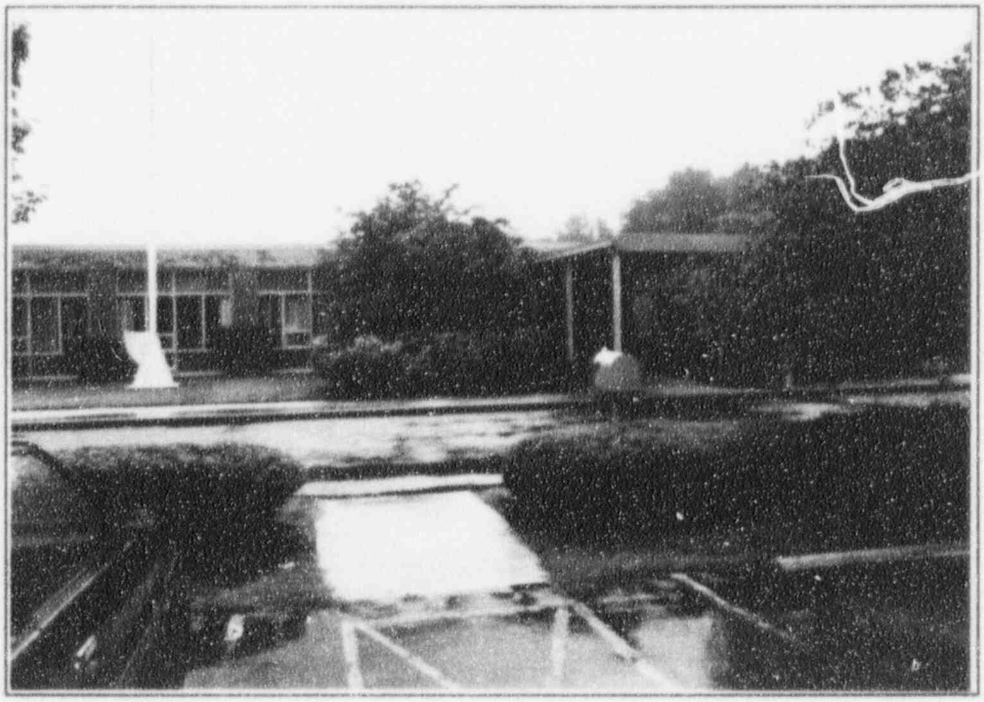
The old incinerator will be checked by a meter survey and swipes. If radioactivity is detected, a decision will be made whether to decontaminate or dispose of the contaminated parts as low-level waste. The scoping survey indicated that this incinerator does not contain any activity above background levels 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



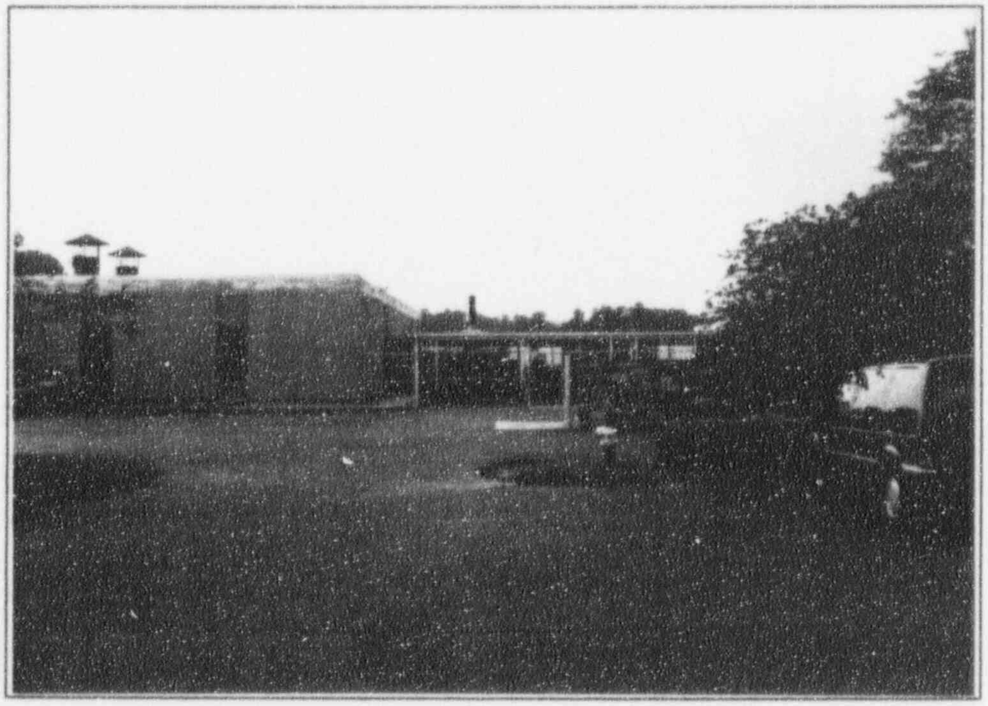
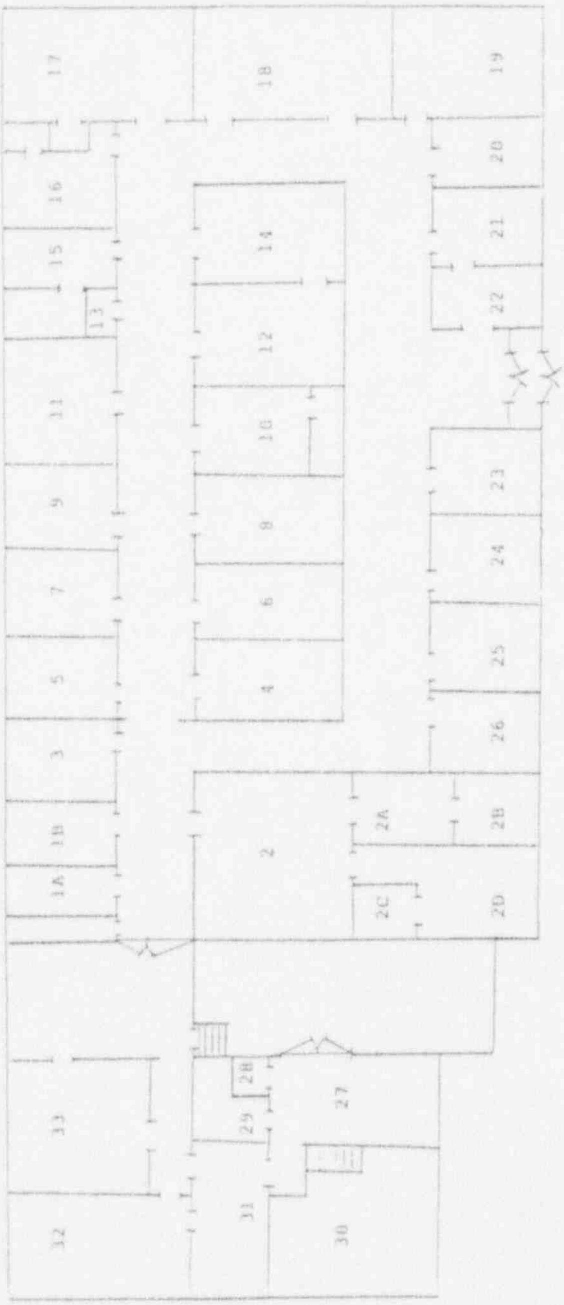


Figure 10
BRF Laboratories



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
6
7
9
12
14
17
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.

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

Planning and Preparation Cost Table

Task		Work Days					
		Supervisor	Foreman	H.P.	Technician	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
4.	Procuring of Special Equipment						N/A
5.	Staff Training	3		1	50	54	$15,200
6.	Characterization of Radiological Condition of the Facility (Including soil and tailings analysis or groundwater analysis, if applicable)	INCLUDED IN TASK 1					
7.	Other						N/A
8.	Total						$43,700

Table 5 (continued)
Cost Estimating Tables
FB-8

Planning and Preparation Unit Cost Table

Position	Basic Salaries $/yr)	Overhead Rate (%)	Worker Cost/Hour
Supervisor			$85
Foreman			N/A
Craftsman			$20
Technician			$35
Health Physicist			$50
Laborer			$16
Clerical			N/A
Other			$29

Radioactive Facility Components Decontamination\Dismantling Cost Table

	No.	Dimensions		No.	Dimensions
Glove Boxes	1	2.5(m^3)	Amount of Floor Space	-	551(m^2)
Fume Hood	24	232(m^2)	Ventilation Ductwork	-	N/A(m^2)
Hot Cells	0	N/A(m^3)	Amount of Wall Space	-	1730(m^2)
Lab Benches	-	182(m^2)	Other	-	N/A(m^2)
Sink and Drain	34	90(m^2)			

Table 5 (continued)
Cost Estimating Tables
FB-8

Radioactive Facility Components Decontamination/Dismantling Cost Table

			Work Days					
Task	Supervisor	Foreman	Technicians	H.P.	Craftsmen	Laborer	Total	Total Cost
1. Decon/Dismantle Major Components and/or Processing and Storage Tanks							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 Areas - Other					3		3	$600
4. Decon/Dismantle Service Facilities - Maintenance Shop - Decontamination Areas - Ventilation System - Other	CONTINGENCY FOR HVAC SYSTEM							$150,000
5. Decon/Dismantle Waste Treatment Facilities and Storage Areas on the Site (Including exhume and package contaminated soil and tailings, if any) - Fluoride Lagoons - Nitrate Lagoons - CaF2 Waste Recovery - Ground Water Restoration - Other								N/A
6. Monitor for compliance, reclean and remonitor, if necessary								N/A
7. Other (e.g., contractor fees)								N/A

Table 5 (continued)
Cost Estimating Tables
FB-8

Decontamination/Dismantling Small Tools Cost Table

Equipment/Supply	Quantity	Cost
Hand tools, Plastic Bags, Mops, Rags, Brushes, Solutions	1 lot	$16,900

Radioactive Wastes Packaging Costs Table

Waste Type	Volume (m^3)	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					$2,950

Radioactive Wastes Shipping Costs Table

Distance Shipped 300 (miles)
Unit cost for shipment $3.00 ($/mile/truckload)
Additional charges
Overweight N/A ($/mile)
Surcharges N/A ($/mile)

Waste Type	No. of Shipments	Unit Cost for Shipping	Distance Shipped	Surcharge	Transportation Cost
Low-level	1	$3.00	300	-0-	$900
Total					$900

Tabie 5 (continued)
Cost Estimating Tables
FB-8

Radioactive Waste Disposal Cost Table

Burial Charges $5650 ($/m^3)
Surcharges
Per container ______ ($)
Disposal ______ ($/m^3)

Waste Type	Burial Volume	Unit Cost of Burial	Surcharge	Burial Cost
Low-level	12.3 m^3	$5650	-0-	$69,500
Total				$69,500

Facility Ground's Contaminated Areas - Restoration Cost Table

Task	Supervisor	Work Days Foreman	H.P.	Clerical	Total	Total Cost
Backfill and Restore Site					N/A	

Final Radiation Survey Cost Table

Task	Supervisor	Work Days Foreman	H.P.	Clerical	Total	Total Cost
Survey						$127,500
FDA Review/Submittal	15				15	$ 3,500
Total						$131,000

Site Stabilization, Long-Term Surveillance Cost Table

Task	Supervisor	Work Days Foreman	H.P.	Clerical	Total	Total Cost
	NOT APPLICABLE					N/A

Table 6
Cost Estimating Tables
MOD-1

Planning and Preparation Cost Table

Work Days

Task		Supervisor	Foreman	H.P.	Technician	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
4.	Procuring of Special Equipment						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 TASK 1					
7.	Other						N/A
8.	Total						$30,700

Table 6 (continued)
Cost Estimating Tables
MOD-1

Planning and Preparation Unit Cost Table

Position	Basic Salaries $/yr)	Overhead Rate (%)	Worker Cost/Hour
Supervisor			$85
Foreman			N/A
Craftsman			$20
Technician			$35
Health Physicist			$50
Laborer			$16
Clerical			N/A
Other			$29

Radioactive Facility Components Decontamination and/or Dismantling

	No.	Dimensions		No.	Dimensions
Glove Boxes	0	N/A(m^3)	Amount of Floor Space		281(m^2)
Fume Hood	6	29(m^2)	Ventilation Ductwork		N/A(m^2)
Hot Cells	0	N/A (m^3)	Amount of Wall Space		552(m^2)
Lab Benches	-	693(m^2)	Other		N/A(m^2)
Sink and Drain	8	20(m^2)			

Table 6 (continued)
Cost Estimating Tables
MOD-1

Radioactive Facility Components Decontamination/Dismantling Cost Table

Task	Work Days Supervisor	Foreman	Technicians	H.P.	Craftsmen	Laborer	Total	Total Cost
1. Decon/Dismantle Major Components and/or Processing and Storage Tanks								N/A
2. Decon/Dismantle Laboratories, Fume Hoods, Glove Boxes, Benches, etc.								$31,700
3. Decon/Dismantle Waste Areas - Radwaste Areas - Scrap Recovery Areas - Other								$600
4. Decon/Dismantle Service Facilities - Maintenance Shop - Decontamination Areas - Ventilation System - Other								N/A
5. Decon/Dismantle Waste Treatment Facilities and Storage Areas on the Site (Including exhume and package contaminated soil and tailings, if any) - Fluoride Lagoons - Nitrate Lagoons - CaF2 Waste Recovery - Ground Water Restoration - Other								N/A
6. Monitor for compliance, reclean and remonitor, if necessary								N/A
7. Other (e.g., contractor fees)								N/A

Table 6 (continued)
Cost Estimating Tables
MOD-1

Decontamination/Dismantling Small Tools Cost Table

Equipment/Supply	Quantity	Cost
Brushes, Rags,	1 lot	$2,900
Solutions, Gloves		
Clothing, Etc.		

Radioactive Wastes Packaging Costs Table

Waste Type	Volume (m^3)	No. of Containers	Type of Containers	Unit Cost of Container	Cost of Container
Low-level	0.68	18	55 Gal Drums	50	$900
Low-level	2.8	3	Refrigerator	N/A	N/A
Low-level	4.1	2	Freezer	N/A	N/A
Total					$900

Radioactive Wastes Shipping Costs Table

Distance Shipped	300 (miles)
Unit cost for shipment	$3.00 ($/mile/truckload)
Additional charges	
Overweight	N/A ($/mile)
Surcharges	N/A ($/mile)

Waste Type	No. of Shipments	Unit Cost for Shipping	Distance Shipped	Surcharge	Transportation Cost
Low-level	1	$3.00	300	-0-	$900
Total					$900

Table 6 (continued)
Cost Estimating Tables
MOD-1

Radioactive Waste Disposal Cost Table

Burial Charges $5650 ($/m^3)
Surcharges
Per container N/A ($)
Disposal N/A ($/m^3)

Waste Type	Burial Volume	Unit Cost of Burial	Surcharge	Burial Cost
Low-level	8.8 m^3	$5650	-0-	$50,000
Total				$50,000

Facility Ground's Contaminated Areas - Restoration Cost Table

Task	Supervisor	Foreman	Work Days H.P.	Clerical	Total	Total Cost
Backfill and Restore Site						N/A

Final Radiation Survey Cost Table

Task	Supervisor	Foreman	Work Days H.P.	Clerical	Total	Total Cost
Survey						$31,300
FDA Review/Submit						$3,500
Total						$34,800

Site Stabilization, Long-Term Surveillance Cost Table

Task	Supervisor	Foreman	Work Days H.P.	Clerical	Total	Total Cost
	NOT APPLICABLE					N/A

Table 7
Cost Estimating Tables
CVM

Planning and Preparation Cost Table

	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
4. 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						N/A
8. Total						$29,500

Table 7 (continued)
Cost Estimating Tables
CVM

Planning and Preparation Unit Cost Table

	Unit Cost for Workers		
Position	Basic Salaries $/yr)	Overhead Rate (%)	Worker Cost/Hour
Supervisor			$85
Foreman			N/A
Craftsman			$20
Technician			$35
Health Physicist			$50
Laborer			$15
Clerical			N/A
Other			$29

Radioactive Facility Components Decontamination/Dismantling Cost Table

	No.	Dimensions		No.	Dimensions
Glove Boxes	0	N/A(m^3)	Amount of Floor Space	-	42(m^2)
Fume Hood	2	9.7(m^2)	Ventilation Ductwork	-	N/A(m^2)
Hot Cells	0	N/A(m^3)	Amount of Wall Space	-	98(m^2)
Lab Benches	-	9.0(m^2)	Other	-	N/A(m^2)
Sink and Drain	4	10(m^2)			

Table 7 (continued)
Cost Estimating Tables
CVM

Radioactive Facility Components Decontamination Dismantling Cost Table

			Work Days					
Task	Supervisor	Foreman	Technicians	H.P.	Craftsmen	Laborer	Total	Total Cost
1. Decon/Dismantle Major Components and/or Processing and Storage Tanks								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 Areas - Other								N/A
4. Decon/Dismantle Service Facilities - Maintenance Shop - Decontamination Areas - Ventilation System - Other								N/A
5. Decon/Dismantle Waste Treatment Facilities and Storage Areas on the Site (Including exhume and package contaminated soil and tailings, if any) - Fluoride Lagoons - Nitrate Lagoons - CaF2 Waste Recovery - Ground Water Restoration - Other								N/A
6. Monitor for compliance, reclean and remonitor, if necessary								N/A
7. Other (e.g., contractor fees)								N/A

Table 7 (continued)
Cost Estimating Tables
CVM

Decontamination/Dismantling Small Tools Cost Table

Equipment/Supply	Quantity	Cost
Hand Tools, Gloves	1 lot	$350
Mops, Rags		
Cloths, Solutions		

Radioactive Wastes Packaging Costs Table

Waste Type	Volume (m^3)	No. of Containers	Type of Containers	Unit Cost of Container	Cost of Container
Low-level	0.68	3	55 Gal Drums	$50	$150
Total		3			$150

Radioactive Waste Shipping Costs Table

Distance Shipped 300 (miles)
Unit cost for shipment $3.00 ($/mile/truckload)
Additional charges
Overweight N/A ($/mile)
Surcharges N/A ($/mile)

Waste Type	No. Of Shipments	Unit Cost for Shipping	Distance Shipped	Surcharge	Transportation Cost
Low-level	1	$3.00	300	-0-	$900
Total					$900

Table 7 (continued)
Cost Estimating Tables
CVM

Radioactive Waste Disposal Cost Table

Burial Charges $5650 (\$/m^3)
Surcharges
Per container -0- (\$)
Disposal -0- (\$/m^3)

Waste Type	Burial Volume	Unit Cost of Burial	Surcharge	Burial Cost
Low-level	3.2m^3	$5650	-0-	$18,250
Total				$18,250

Facility Ground's Contaminated Areas - Restoration Cost Table

		Work Days				
Task	Supervisor	Foreman	H.P.	Clerical	Total	Total Cost
Backfill and Restore Site						N/A

Final Radiation Survey Cost Table

		Work Days				
Task	Supervisor	Foreman	H.P.	Clerical	Total	Total Cost
Survey						$20,400
FDA Review/Submittal	15				15	$ 3,500
Total						$23,000

Site Stabilization, Long-Term Surveillance Cost Table

		Work Days				
Task	Supervisor	Foreman	H.P.	Clerical	Total	Total Cost
	NOT APPLICABLE					N/A

Table 8
Cost Estimating Tables
BRF

Planning and Preparation Cost Table

Work Days

Task	Supervisor	Foreman	H.P.	Technician	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
4. Procuring of Special Equipment						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 TASK 1					
7. Other						N/A
8. Total						$30,700

Table 8 (continued)
Cost Estimating Tables
BRF

Planning and Preparation Unit Cost Table

Position	Basic Salaries $/yr)	Overhead Rate (%)	Worker Cost/Hour
Supervisor			$85
Foreman			N/A
Craftsman			$20
Technician			$35
Health Physicist			$50
Laborer			$16
Clerical			N/A
Other			$29

Radioactive Facility Components Decontamination/Dismantling Cost Table

	No.	Dimensions		No.	Dimensions
Glove Boxes	0	N/A(m^3)	Amount of Floor Space	-	239(m^2)
Fume Hood	6	33.3(m^2)	Ventilation Ductwork	-	N/A(m^2)
Hot Cells	0	N/A(m^3)	Amount of Wall Space	-	453(m^2)
Lab Benches		48.3(m^2)	Other	-	N/A(m^2)
Sink and Drain	11	8.2(m^2)			

Table 8 (continued)
Cost Estimating Tables
BRF

Radioactive Facility Components Decontamination/Dismantling Cost Table

	Work Days							
Task	Supervisor	Foreman	Technicians	H.P.	Craftsmen	Laborer	Total	Total Cost
1. Decon/Dismantle Major Components and/or Processing and Storage Tanks								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								N/A
4. Decon/Dismantle Service Facilities - Maintenance Shop - Decontamination Areas - Ventilation System - Other								N/A
5. Decon/Dismantle Waste Treatment Facilities and Storage Areas on the Site (Including exhume and package contaminated soil and tailings, if any) - Fluoride Lagoons - Nitrate Lagoons - CaF2 Waste Recovery - Ground Water Restoration - Other								N/A
6. Monitor for compliance, reclean and remonitor, if necessary								N/A
7. Other (e.g., contractor fees)								N/A

Table 8 (continued)
Cost Estimating Tables
BRF

Decontamination/Dismantling Small Tools Cost Table

Equipment/Supply	Quantity	Cost
Hand Tools, Brushes Gloves, Rags, Mops, Solutions, etc.	1 lot	$2,400

Radioactive Wastes Packaging Costs Table

Waste Type	Volume (m^3)	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

Radioactive Wastes Shipping Costs Table

Distance Shipped 300 (miles)
Unit cost for shipment $3.00 ($/mile/truckload)
Additional charges
Overweight N/A ($/mile)
Surcharges N/A ($/mile)

Waste Type	No. Of Shipments	Unit Cost for Shipping	Distance Shipped	Surcharge	Transportation Cost
Low-level	1	$3.00	300	-0-	$900
Total					$900

Table 8 (continued)
Cost Estimating Tables
BRF

Radioactive Waste Disposal Cost Table

Burial Charges 5650 ($/m³)
Surcharges
Per container -- ($)
Disposal -- ($/m³)

Waste Type	Burial Volume	Unit Cost of Burial	Surcharge	Burial Cost
Low-level	8.m³	$5650	-0-	$50,100
Total				$50,100

Facility Ground's Contaminated Areas - Restoration Cost Table

		Work Days				
Task	Supervisor	Foreman	H.P.	Clerical	Total	Total Cost
Backfill and Restore Site	CONTINGENCY FOR SITE REMEDIATION					$100,000

Final Radiation Survey Cost Table

		Work Days				
Task	Supervisor	Foreman	H.P.	Clerical	Total	Total Cost
Survey						$134,200
FDA Review/Submittal	15				15	$ 3,500
Total						$137,700

Site Stabilization, Long-Term Surveillance Cost Table

		Work Days				
Task	Supervisor	Foreman	H.P.	Clerical	Total	Total Cost
	NOT APPLICABLE					N/A

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 Beltsville 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[a]	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 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

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

[b] As used in this table, dpm (disintegrations per minute) means the rate of emission by radioactive material as determined by correcting the counts per minute observed by an appropriate detector for background, efficiency, and geometric factors associated with the instrumentation.

[c] 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.

[d] The maximum contamination level applies to an area of not more than 100 cm^2.

[e] The amount of removable radioactive material per 100 cm^2 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.

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

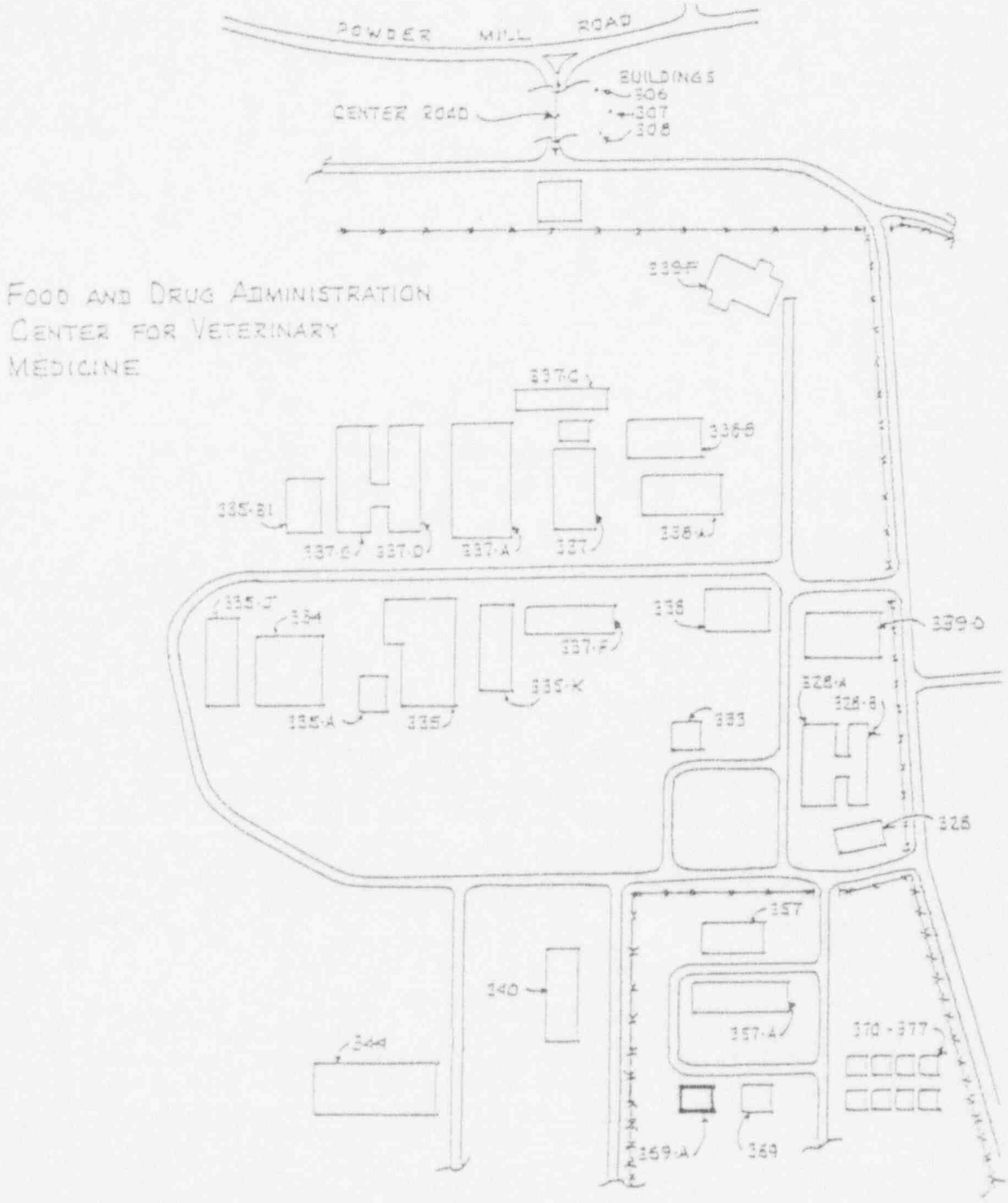
Module One (MOD-1) is a 235,000 square foot facility which was completed in 1990. The MOD-1 facility is designed for containment of chemical, biohazard and radioactive materials. The use of radioactive materials has been rigidly controlled. Nine of the 56 laboratories are reserved for use with radioactive 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.

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.

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
sulfur-35
iron-55
iron-59
chromium-64
zinc-65
technetium-99
cadmium-109
cadmium-115
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 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 deregulated 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 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.

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 pla[illegible]ecial nuclear material.

PART C

Table of Contents

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.

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

ECOLOGY SERVICES, INC.

300 Second St.
Laurel MD 20707
Tel (301) 498-1514
Fax (301) 498-9432

August 11, 1992

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.

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 Masslin wipes taken. The incinerator stack was also surveyed and a Masslinn wipe taken. The meter survey and Masslinn 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

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 Vacuum 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	Current 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

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	Floor Floor 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 as part of renovation)	Negative
337	Unrestricted Laboratory	Occupied	Floor drains Hood exhaust HVAC unit Sink	Negative
338	Restricted Laboratory (3H, 125I)	Occupied	Sink 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.
FOB-8	6082	Sink	U-nat.	Unrestricted laboratory.
FOB-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.

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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.

BETWEEN:

LICENSE FEE MANAGEMENT BRANCH, ARM
AND
REGIONAL LICENSING SECTIONS

(FOR LFMS USE)
INFORMATION FROM LTS

PROGRAM CODE: 03610
STATUS CODE: 2
FEE CATEGORY: EX 3L
EXP. DATE: 19921231
FEE COMMENTS: V
DECOM FIN ASSUR REQD: Y

LICENSE FEE TRANSMITTAL

A. REGION I

1. APPLICATION ATTACHED
   APPLICANT/LICENSEE: HEALTH & HUMAN SERVICES, DEPT. OF
   RECEIVED DATE: 921123
   DOCKET NO: 3003917
   CONTROL NO.: 116499
   LICENSE NO.: 08-00482-03
   ACTION TYPE: AMENDMENT

2. FEE ATTACHED
   AMOUNT: 0
   CHECK NO.: 0

3. COMMENTS

SIGNED M. A. Perkins
DATE 11/23/92

B. LICENSE FEE MANAGEMENT BRANCH (CHECK WHEN MILESTONE 03 IS ENTERED /__/)

1. FEE CATEGORY AND AMOUNT: ________________

2. CORRECT FEE PAID. APPLICATION MAY BE PROCESSED FOR:
   AMENDMENT ____________
   RENEWAL ____________
   LICENSE ____________

3. OTHER ________________

SIGNED ________________
DATE ________________