DEPARTMENT OF VETERANS AFFAIRS

Memorandum

Date: FEB 21 2006

From: Director, VHA National Health Physics Program (115HP/NLR)

Subj: VHA Permit Number 37-10509-01 (for radioactive materials use)

To: Director (542/00), VA Medical Center, Coatesville, Pennsylvania

1. We are forwarding the attached VHA Permit Number 37-10509-01, Amendment No. 1. This amendment is issued based on your request of February 3, 2006, for a new permit.

2. Please review the permit amendment carefully to ensure you understand the permit approvals and conditions. This permit is issued as a program code 3620 permittee for limited-scope research radioactive material for storage only, pending disposal.

3. You should note future amendment requests can be submitted as VHA correspondence or electronic mail. Electronic mail is preferred to help expedite responses. The e-mail address is vhconhpp@va.gov.

4. If you have any questions, please contact Paul L. Yurko, VHA National Health Physics Program, at (410) 642-2411, extension 6288.

E. Lynn McGuire

Attachment

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

JUN 28 2007

In Reply Refer To: 598/115HP/NLR

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

Dear Ms. Frazier:

Per NRC License 03-23853-01VA, we are enclosing closeout survey documentation for the VA Medical Center, Coatesville, Pennsylvania, for your review and approval. The documentation is to support a request to release the location of use, identified as Building 11, for unrestricted use.

This facility had a previous NRC license that was terminated in 1996. However, in early 2006, radioactive materials were found during clean-up of two laboratory rooms. We issued a permit to authorize storage, pending disposal, for the materials. The facility began a decommissioning process using methods consistent with the NUREG-1575 guidelines.

For review and approval of this request, we enclose a copy of the VHA permit issued to the facility and the facility's decommissioning survey report of June 21, 2007. The report has a historical site assessment and survey results consistent with 10 CFR 30.36 criteria to evaluate the facility for a decommissioning action.

We conclude the survey results comply with 10 CFR 20.1402, which limits radiation exposure to 25 millirems per year from residual radioactivity that is distinguishable from background.

If you have any questions or comments, please contact Gary E. Williams, VHA National Health Physics Program, at (501) 257-1572.

Sincerely,

E. Lynn McGuire
Director, National Health Physics Program

Enclosures

RECEIVED JUL 05 2007

Department of Veterans Affairs

Page 1 of 3 pages	**MATERIALS PERMIT**	Amendment No. 1

In accordance with VHA Directive 1105.1 and in reliance on statements made by the applicant, permission is hereby granted to receive, possess, transfer, and store radioactive materials listed below, and to use this material for the purpose and at the places listed below.

Permittee	
1. VA Medical Center	3. In accordance with your request of February 3, 2006, Permit Number 37-10509-01 is issued to read as follows:
2. 1400 Black Horse Hill Road Coatesville, Pennsylvania 19320-2096	4. Expiration date: February 28, 2008
	5. Docket or Reference Number: 030-03127

6. Byproduct, source, and/or special nuclear material	7. Chemical and/or physical form	8. Maximum amount permittee may possess at any one time under this permit
A. Hydrogen 3	A. Any	A. 10 millicuries
B. Carbon 14	B. Any	B. 10 millicuries

9. Authorized use: Storage only, pending disposal.

CONDITIONS

10. Permitted material may be used only at the permittee's facilities located at the 1400 Black Horse Hill Road, Coatesville, Pennsylvania.

11. A. The Radiation Safety Officer shall authorize and supervise individuals who work under this permit.

    B. The Radiation Safety Officer for this permit is Mary E. Moore, M.S.

12. Permitted material shall not be used in or on human beings.

13. The permittee shall not use permitted material in field applications where activity is released except as provided otherwise by specific condition of this permit.

14. Experimental animals, or the products from experimental animals, that have been administered permitted material shall not be used for human consumption.

15. This permit does not authorize commercial distribution of permitted material.

16. A. Sealed sources shall be tested for leakage and/or contamination at intervals not to exceed the intervals as specified by the certificate of registration issued by the Nuclear Regulatory Commission under 10 CFR 32.210 or under equivalent regulations of an Agreement State.

    B. Notwithstanding Paragraph A of this condition, sealed sources designed to primarily emit alpha particles shall be tested for leakage and/or contamination at intervals not to exceed three months.

    C. Each sealed source fabricated by the permittee shall be inspected and tested for construction defects, leakage, and contamination prior to any use or transfer as a sealed source.

D. In the absence of a certificate from a transferor indicating a leak test has been made within the intervals specified in the certificate of registration issued by the Nuclear Regulatory Commission under 10 CFR 32.210 or under equivalent regulations of an Agreement State, prior to the transfer, a sealed source received from another person shall not be put into use until tested and the test results received.

E. Sealed sources need not be tested if they contain only hydrogen 3, or they contain only a radioactive gas, or the half-life of the isotope is 30 days or less, or they contain not more than 100 microcuries of beta- and/or gamma-emitting material, or not more than 10 microcuries of alpha-emitting material.

F. Sealed sources need not be tested if they are in storage and are not being used; however, when they are removed from storage for use or transfer to another person, and have not been tested within the required leak test interval, they shall be tested before use or transfer. No sealed source shall be stored for a period of more than 10 years without being tested for leakage and/or contamination.

G. The leak test shall be capable of detecting the presence of 0.005 microcurie (185 becquerels) of radioactive material on the test sample. If the test reveals the presence of 0.005 microcurie (185 becquerels) or more of removable contamination, a report shall be filed with the National Health Physics Program in accordance with 10 CFR 30.50(c)(2), and the source shall be removed immediately from service and decontaminated, repaired, or disposed of in accordance with Nuclear Regulatory Commission regulations.

H. Tests for leakage and/or contamination, including leak test sample collection and analysis, shall be performed by the permittee or by other persons specifically licensed by the Nuclear Regulatory Commission or an Agreement State to perform such services.

17. Sealed sources containing permitted material shall not be opened or sources removed from source holders by the permittee.

18. A. The permittee shall conduct physical inventories to account for all sealed sources and/or devices received and possessed under this permit.

    (1) Quarterly, for sealed sources with either current activity greater than one millicurie or current activity greater than 1000 times the quantities in 10 CFR 20, Appendix C.

    (2) Semiannually, for all other sealed sources, except sources specifically exempted by 10 CFR 30.

    B. The permittee shall maintain records for five years from the date of each inventory and include the radionuclides, quantities, manufacturer's name and model numbers, and the date of the inventory.

    C. The permittee shall classify sealed sources, not in active use for their intended clinical or research purpose for a period of 24 months, as disused sources and evaluate the disused sources for disposal as expeditiously as possible.

    D. The permittee shall provide oversight for security of radioactive materials by:

    (1) Compliance with regulations per 10 CFR 20.1801 and 10 CFR 20.1802.

    (2) Prevention of adversary or unauthorized removal of, or access to, radioactive materials.

    (3) Use of two delay methods for sealed sources not in use.

    (4) Focus to security commensurate with possible risks of radioactive materials unauthorized use.

19. A. Detector cells containing a titanium tritide foil or a scandium tritide foil shall only be used in conjunction with a properly operating temperature control mechanism which prevents the foil temperature from exceeding that specified by the manufacturer and approved by Nuclear Regulatory Commission.

B. When in use, detector cells containing a titanium tritide foil or a scandium tritide foil shall be vented to the outside.

20. Maintenance, repair, cleaning, replacement, and disposal of foils contained in detector cells shall be performed only by the device manufacturer or other persons specifically authorized by the Nuclear Regulatory Commission or an Agreement State to perform such services.

21. The permittee is authorized to hold radioactive material with a physical half-life of less than 120 days for decay in storage before disposal in ordinary trash, provided:

    A. Before disposal as ordinary trash, the waste shall be surveyed at the container surface with the appropriate survey instrument set on its most sensitive scale and with no interposed shielding to determine its radioactivity cannot be distinguished from background. All radiation labels shall be removed or obliterated.

    B. A record of each such disposal permitted under this permit condition shall be retained for three years. The record must include the date of disposal, the date on which the byproduct material was placed in storage, the radionuclides disposed, the survey instrument used, the background dose rate, the dose rate measured at the surface of each waste container, and the name of the individual who performed the disposal.

22. The permittee is authorized to transport permitted material in accordance with the provisions of 10 CFR 71, "Packaging and Transportation of Radioactive Material."

23. Incineration of permitted material for the purpose of disposal may be performed only as authorized by 10 CFR 20.2004(a)(2).

24. Except as specifically provided otherwise in this permit, the permittee shall conduct its program in accordance with the statements, representations, and procedures contained in the documents, including any enclosures, listed below. The Nuclear Regulatory Commission regulations shall govern unless the statements, representations, and procedures in the permittee's application and correspondence are more restrictive than the regulations.

    A. Application dated February 3, 2006

FOR THE DEPARTMENT OF VETERANS AFFAIRS

Date: FEB 21 2006

By E. Lynn McGuire

E. Lynn McGuire
Director, National Health Physics Program
North Little Rock, Arkansas

DEPARTMENT OF VETERANS AFFAIRS

MEMORANDUM

Date: June 21, 2007

From: Radiation Safety Officer
Coatesville VAMC

Subj.: Revised Decommissioning Report

To: V.A. Radiation Safety Officer
Director, Coatesville VAMC

As per our conversation, the revised decommissioning report is enclosed. Please replace the May 30, 2007 report with the attached.

Please do not hesitate to call me if you have any questions.

Mary E. Moore

MARY E. MOORE
Radiation Safety Officer
Coatesville VAMC

Coatesville VA Medical Center

2006-2007 Decommissioning Survey Report for Building 11

June 2007

Performed by:
Radiation Safety Office Staff
Philadelphia VA Medical Center

Prepared by R. Shimko, E. M. Session, and M. E. Moore

Approved by: Mary E. Moore
Mary E. Moore, Coatesville VAMC RSO and Philadelphia VAMC RSO

Date: June 18, 2007

Table of Contents

Part A Event Summary page 5

Part B Review of Regulatory Requirements pages 6 - 10

I. Historical Site Assessment
II Potential Environmental Contamination
III Records
IV Surveys
V Surface and Soil Release Criteria

Part C 2006-2007 Decommissioning Survey Report pages 11-22

Section 1) Introduction
Section 2) Background
Section 3) History of Use Summary
Section 4) Survey Plan
Section 5) Implementing the MARSSIM Process
5.1 Release Criteria
5.2 Area Classification
5.3 Survey Unit
5.4 Instrument Selection and Survey Techniques
5.4.a. Surface Scans
5.4.b. Determination of the Number of Survey Points
5.5 Final Survey Procedures
5.6 Analysis of Results

Section 6) Survey Method Implementation
Section 7) Results of 2006-2007 Surveys
Section 8) Conclusions
Section 9) VA NHPP Close-Out Survey Questionnaire
Section10) References

Part D Figures – Building 11 Room Locations pages 24 - 31

Figure 1 - Photograph of Room 202
Figure 2 - Room 120
Figure 3 – Rooms 201 and 202
Figure 4 – Rooms 204 and 204A
Figure 5 – Room 206
Figure 6 – Animal Facility
Figure 7 – Building 11 Overview
Figure 8 – Room B01A

Part E Tables of Survey Results pages 15-52

Table 1 - Summary of Survey Dates and Locations
Table 2 - Survey and Analysis Equipment Used
Table 3 - Inventory of Vials found in Rooms 202 and 120, Building 11
Table 4 - Survey Results for Vials and Box found in Rooms 202 and 120
Table 5 - Survey Results Room 120
Table 6 - Survey Results Room 201
Table 7 - Survey Results Room 202 and Hallway
Table 8 - Survey Results Rooms 204, 206, B01A
Table 9 - Preliminary Survey Results for Animal Facility - on Grid (2 pages)
Table 10 - Survey of Animal Facility Floor – on Grid (5 pages)
Table 11 - Survey of Animal Facility Floor – Random Locations (3 pages)
Table 12 - Room 100 - Miscellaneous Samples, Hoods and Sinks
Table 13 - Survey Results Former Rad Waste Storage Room B01A

Part F Attachments page 53

Attachment 1 Historical Review of Radioactive Material Use
Attachment 2 Leak Test Results for Cesium-137 source
Attachment 3 Beckman Coulter Removal and Transfer of Cesium-137 source
Attachment 4 Commercial Radioactive Waste Vendor Manifest (Radiac Research Corp)
Attachment 5 VA NHPP Closeout Questionnaire

Part A

EVENT SUMMARY

EVENT SUMMARY

Site	Coatesville VA Medical Center 1400 Black Horse Hill Road, Coatesville, PA 19320-2096
Event	Vials of Radioactive Material Found in Freezer
On-Site Location	Freezer in Room 202, Building 11
Total Number of Sources	27 found in Room 202, Building 11 – January 25, 2006 1 found in Room 120, Building 11 – January 27, 2006

Radioactive Material	Tritium (^{3}H)	^{14}Carbon	^{125}Iodine [Table 3 in Report]
Number of Sources	20	6	2
Initial Activity (millicuries)	18	6.56	1
# Sources Activity Unknown	1	-----	1

Discovery Date(s)	January 25 and January 27, 2006
Notification Date	January 25, 2006
Office Notified	Radiation Safety Office, Philadelphia VA Medical Center
NHPP Notification	January 27, 2007
NHPP Reactive Inspection Date	February 3, 2006
NRC License	No. 37-10509-01
Decommission Date	June, 1996
Termination Date	July 12, 1996
NHPP Permit	No. 37-10509-01 [Possession and Storage Only]
Date Issued	February 21, 2006
Additional Source	Liquid Scintillation Counter (Beckman mfr) Room 204
Cesium-137 check source	40 microcuries (Calibration date estimated as 1982)
Part Number	# 598860
Source Disposition	Removed by Beckman on November 2, 2006 and secured Federal Expressed to Beckman on November 3, 2006 Received by Beckman on November 11, 2006
Source Disposal for All H-3, C-14, I-125	April 13, 2006 Removal by Broker (Radiac, Inc) Transferred to Processor (Duratek) Final Disposal by Envirocare
On-Site Survey Dates	2006: February 2, April 6, September 28, October 4 2007: March 9

Part B

Review of Regulatory Requirements

Review of Regulatory Requirements

This section discusses how this report meets the regulatory requirements identified in the National Health Physics Program (NHPP) letter "NRC Region III Guidelines for Decommissioning Adapted from NL070110654 dated January 10, 2007". These requirements are reproduced below. Each is followed by a **"Response"** indicating where the requirement is addressed in this report.

I. Historical Site Assessment Requirements:

a) The historical site assessment must provide a comprehensive description of past locations of use, including buildings, outdoor areas (if any), and rooms in each building where materials were used.

b) The historical site assessment must address the type of activity performed in each area, quantities of materials possessed and used (flow through) for each area.

c) The licensee's response must be a comprehensive document, which list sites of use, past buildings located at each site, rooms, and facilities where licensed radioactive materials were used, since the base license was issued.

Response:

Attachment 1 "Historical Review of Radioactive Material Use: Coatesville VAMC" addresses the above points. Since work with radioactive materials stopped 10 years ago, very few records were recovered at Coatesville. However, documents were obtained from the NRC archives. The historical review for this facility is based on the documentation from the NRC supplemented by personnel interviews.

II. Potential Environmental Contamination:

a) The licensee needs to discuss evaluations of potential environmental contamination resulting from liquid discharges and or burials of material such as 10 CFR 20.304 (rescinded in 1981) and 10 CFR 20.2002 etc.

b) The licensee must determine and indicate whether there were any potential for hold-up tanks, leach or septic fields, sewer lines, in-house plumbing

Response:

Attachment 1 - Section 2 of "Historical Review of Radioactive Material Use: Coatesville VAMC" addresses these issues.

No evidence of environmental contamination was found.

III. Records:

a) The licensee must discuss, and provide if required records which demonstrate that the licensee has performed a thorough inventory review, to account for licensed materials, both sealed and unsealed, including copies of leak tests for sealed sources possessed and used by the licensee.

Response:

Attachment 1 –Section 2 of "Historical Review of Radioactive Material Use: Coatesville VAMC" and Attachment 2 contain this information

IV. Surveys:

a) The acceptable guidelines for surveys are found in Figure 8.1 and Section 15.4 of NUREG 1757 Volume 1, Revision 2 as well as Appendices A and B of NUREG 1757 Volume 2, Revision 1.

b) The following key issues should be considered when reviewing survey results:

i) For the final status survey of past locations of use, each building must be described, to include the street address, general size (number of floors, rooms, and number of rooms where isotopes were used and stored).

Response: See Part C, Section 2 of the Report.

ii) Each location of use (e.g., laboratories, process areas, storage areas, animal laboratories and kennels for dosed animals, incinerators, compactors, waste collection points, hold-up takes, septic fields, etc.) must be specified with enough detail to understand size, equipment and associated ventilation and sanitary/sewer discharge systems.

Response: See Part C, Section 2 of the Report and Section 2 of the Historical Review, Attachment 1

iii) The areas should be classified using a specific scheme such as potential residual contamination, MARSSIM classes or NUREG 5849 impacted or non-impacted areas.

Response: See Part C, Section 5 of the Report.

iv) The systematic survey scheme used by the surveyor should be described. Areas which were impacted as a result of the use of licensed radioactive materials should be identified using knowledge of past site operations together with site characterization surveys. Additionally, consideration for surveys in suspect or non-impacted areas, which could have had potential for contamination, should also be considered.

Response: See Part C, Sections 4 and 6 of the Report.

v) The method used to identify individual measurement/sampling points on each surface in the indoor area that was involved in licensed material use should be

described. The basis for frequency of wipes based on area classification and determination of fixed versus removable should be described.

Response: See Part C, Section 5 of the Report.

vi) The grid or survey map used for systematic sampling should be described, if used.

Response: See Part C, Section 6 of the Report.

vii) Any past surveys by the Radiation Safety Officer or radiation safety staff should be described.

Response: See Section 2 of the Historical Review, Attachment 1

viii) Final status survey data must be tabulated in a report form, which correlates area dose measurements, direct survey meter results, and test for removable contamination keyed to an attached detailed diagram for each area.

Response: See Part E, Tables 4-13 in the Report.

ix) The survey report should indicate findings in individual sections specific to location, buildings and areas. The report should also have a section, which discusses instrumentation, analytical procedures (MDC, MDC for scanning rate), calibration and instrument efficiencies, conversion factors, and quality assurance.

Response: See Part C, Sections 5 and 7 of the Report.

x) The survey report should clarify if a one hundred percent scan of all impacted surfaces in each use area was performed, using an appropriate radiation detection instrument, that is appropriate for specific gamma energies, alpha and beta radiation.

Response: See Part C, Section 5 of the Report.

xi) The type instruments used should be specified with their associated scan sensitivities, discussion of calibration, and certified calibration sources used.

Response: See Part C, Section 6 of the Report.

xii) If it is not possible to ascertain materials used in each area, the survey must be capable of detecting all potential radioactive materials, and their associated radiations, which were authorized under the license.

Response: See Part C, Section 5 of the Report.

xiii) Results must specify instrumentation used, be corrected for efficiency, area factor, and provided in DPM.

Response: See Part E, Tables 4-13 of the Report

xiv) The report should provide details of evaluations and or surveys, analysis of samples collected from drains, hold-up tanks, leaks via sewer lines, vacuum collection systems, re-concentration of radio nuclides release to the sanitary or septic fields (if any), air vents, or other fixtures or equipment that may have become contaminated during licensed material use. This is especially important if renovations have occurred and potentially contaminated areas may be inaccessible under current conditions.

Response: See Part C, Section 7 of the Report.
No evidence of contamination was found in drain lines.

xv) The report should specify release criteria for all past authorized materials. For areas with multiple contaminates, the sum of ratios needs to be applied.

Response: See Part C, Section 5 of the report.

V. Surface and Soil Release Criteria

NUREG 1757 Volume 1, Revision 2, Appendix B has acceptable surface and soil release criteria.

Response: See Part C, Section 5 of the Report.

Part C

2006-2007

Decommissioning Survey Report

1. Introduction and Summary

In 1995, Coatesville VAMC stopped using radioactive materials in Nuclear Medicine and Research. A decommissioning survey was performed in 1996. Based on the results of the 1996 Decommissioning Report, the NRC terminated Coatesville VAMC NRC license in 1996.

However, in early 2006, twenty-eight (28) radioactive sources were found during the clean-up of two laboratory rooms. These two rooms were not identified as having been surveyed in 1996 Decommissioning Report. Because of this discovery, decommissioning efforts were initiated on February 3, 2006. The decommissioning included a historical review of documents, staff interviews and additional radiological surveys on the Research Building (No. 11).

This report describes the decommissioning process conducted at the Coatesville VA Medical Center in response to the January 25 and 27, 2006 discoveries. NHPP and Staff from the Radiation Safety Office at the Philadelphia VAMC (PVAMC) initiated on-site surveys on February 3, 2006. Philadelphia VAMC RSO staff performed additional on-site surveys on April 6, September 28, October 4, 2006, and March 9, 2007. The areas surveyed during each visit are summarized in **Table 1**. A summary of the detection and analysis equipment used is provided in **Table 2**. Inventory and removable contamination levels found on the radioactive sources and associated containers are summarized in **Tables 3 and 4** respectively. This report documents the results of the decommissioning surveys conducted in the two rooms in which radioactive sources were found plus supplemental surveys performed throughout the building. **(Tables 5 through 13).** The measured activity for all areas wipe-tested in 2006 and 2007 were below all release criteria used and most were below background level. In addition, all area survey results using Geiger-counter with a pancake probe were at background level.

2. Background

The Coatesville VAMC is located at 1400 Blackhorse Pike, Coatesville, PA 19320. Building No.11 is the Research Building. It is a three storey brick building, approximately 40 by 200 feet in size, and contains 65 rooms.

Coatesville VAMC used radioactive materials under NRC license 37-01509-01. The history of the use of radioactive materials is discussed in **Attachment 1, "Historical Review of Radioactive Materials, Coatesville VAMC", (2006)**. Research use of radioactive materials in Building 11 was discontinued in 1989. Clinical use by the Nuclear Medicine Service in Building No. 59 was terminated in 1995. At the time the license was terminated in 1996, radioisotopes authorized for research use were carbon-14, hydrogen-3, and iodine-125.

A final survey of Nuclear Medicine and Research areas was performed by Philadelphia VAMC Radiation Safety personnel and a report was issued June, 1996. This report states that radionuclide use in Building 11 was limited to Room 204 and radioactive waste storage was in Room B01A. It further states Room 110 was listed in the license application packet as a location of use. However, interviews of long-time employees in 1996 indicated that radioactive materials were not used in Room 110 (surgical suite). In addition to Rooms B01A, 110, and 204, Room 203

was also surveyed in 1996. All survey results were below the release criteria (discussed below), although some wipe survey measurements were above background levels. Rather than recount the swipes with values above background to determine if results were due to counting equipment fluctuations, the surveyors decontaminated each area and re-swiped them. All of the re-swipes were at background level. A final survey was also conducted in Nuclear Medicine in Building 59 and no contamination was found. After receiving the decommissioning report, the Nuclear Regulatory Commission terminated Coatesville's license in 1996.

On January 25, 2006, Coatesville laboratory personnel found 27 radioactive-labeled vials in 25 containers in a cardboard box in a freezer in Room 202 in Building 11. This laboratory room had not been used for a number of years. The vials were small glass vials with septum lids and were inside plastic tube-like containers. Many of the glass vials were also in plastic baggies which were placed inside the plastic container. **Figure 1** is a photograph of Room 202 showing the freezer and the plastic containers.

Coatesville staff notified the Philadelphia VAMC Radiation Safety Office on January 25, 2006. They were advised to secure Room 202 and all access to the second floor to ensure double-delay type of security. PVAMC RSO notified NHPP of found sources.

As a result of this discovery, other areas of Building 11 were searched and one additional vial was found on January 27, 2006 in a laboratory cabinet in Room 120. This laboratory room is currently being used for non-radioactive research. The vial from Room 120 was temporarily stored in Room 206, until the NHPP and PVAMC Radiation Safety Office staff transferred it on February 3, 2006 to Room 202 . This transfer consolidated all found sources in one location. Building 11 was searched again on February 3, 2006 and no additional sources of radioactivity were found.

An extensive survey was initiated on February 3, 2006 in the rooms where radioactive materials were found – Rooms 202 and 120. Room 201 was also surveyed because Rooms 201 and 202 are essentially one large area. Confirmatory surveys were also done in rooms in which radioactive materials were known to have been used – Rooms B01, 204, and 206. No contamination was found.

The plastic containers holding the vials were removed from the freezer in Room 202, and wiped tested. Wipe samples were taken of the exterior of each vial and the plastic bags that contained each vial. A wipe was also taken of the cardboard box in which the vials had been stored while in the freezer. After being swiped tested the vials were placed in clean plastic bags and placed inside a clean cardboard box. This box was transferred to a Styrofoam box with a lid which was taped in place. This Styrofoam box was secured inside the Cold Room in Room 201 until arrangements were made for disposal. All vials containing Tritium, Carbon-14 and decayed Iodine-125, the associated containers, plastic bags, the cardboard and Styrofoam boxes were disposed by a commercial broker on April 6, 2006.

An old liquid scintillation counter (manufactured by Beckman) was stored in Room 204. Repair and calibration options were investigated. Using this equipment to analyze wipe tests would expedite the decommissioning process. Since it was cost prohibitive to repair this equipment, the Cesium-137 reference source was removed by a Beckman Coulter, Inc. representative on November 2, 2006. The source was leak tested, packed for shipment to Beckman, and secured. The source was Federal Expressed to Beckman on November 3, 2007 and received by Beckman

Coulter, Inc on November 11, 2007. Following removal of the source, the liquid scintillation counter was then scheduled for disposal.

Following the February 2, 2006 site visit, a historical review of documents was undertaken to determine if radioactive material may have been used in others areas. Documents for the time period 1964 to 1979 were requested from the NRC. The Historical Review is included in this report as **Attachment 1**.

3. History of Use Summary

No records were obtained for the period prior to 1964, but available records indicate that radioactive materials were used in Building 11 before 1964.

Documents identify Rooms 100, 110, 203, and 204 in Bldg. 11, as rooms-of-use for radioactive materials. From 1964 to 1989 the long-lived radioisotopes H-3 and C-14 were used, or approved for use, in Rooms 110, 203 and 204. While Room 110 was identified on a license application as a radioactive materials use area, some documentation suggests it may not have been used for this purpose. In either case, Room 110 was surveyed during the 1996 decommissioning.

Information reviewed indicates 1966 as the last recorded date of use for C-14 and H-3 in Room 100. By 1996, it appears the history of any radioactive material use in this Room was forgotten. As a result, Room 100 was not surveyed or evaluated as part of 1996 decommissioning. Prior to 2006, Room 100 had been remodeled, reduced in size and converted into an office. While no residual contamination was expected to remain, swipe tests of this room were taken during the September and October 2006 surveys. As expected, wipe test results in Table 12 were below or slightly above background.

Animals injected with radioactive materials were housed in Rooms B-1 through B-11 in the basement Animal Facility. Radioactive waste and frozen radioactive animal carcasses were stored in Room B01A. Records indicate that radioactive liquids were discharged via sinks to the sewer system. The 1996 Decommissioning Survey found a small amount of H-3 contamination in a sink in Room 204. While the sink was decontaminated to 63 dpm/100^2cm (Table III, 1996 Report), no documentation was found that addressed possible contamination levels in the drain pipes. The last discharge would have been in 1989 and annual activities discharged would have been a few millicuries at most.

To determine if any radioactive contamination were present in Bldg 11's drain pipes in 2006, swipes were taken in floor drains in the Animal Facility on April 6, 2006 (Table 9) and in sink drains in Rooms 110 and 203 during September and October 2006 surveys (Table 12). Very low level results are reported in Tables 9 and 12.

No evidence was found for any release to soils or groundwater. Interviews with staff indicate that such a release would be unlikely.

Records identify two Ni-63 sealed sources used as reference check sources in each of two gas chromatographs in Bldg. 11. One Ni-63 source activity was identified as 15-millcuries. The second source activity was not identified. It is assumed the two source activities were matched at 15-mCi. Neither these sources nor the gas chromatographs were found during multiple searches

of Bldg 11 in 2006. Two February 1988 Monthly Isotope Reports identify 2 Ni-63 sources being placed in a radioactive waste drum in Room 1-B in Building 11. No disposal records were found for either the Ni-63 sources or the gas chromatograph.

A Beckman liquid scintillation counter (Model LS 6500) containing an estimated 40-microcurie Cs-137 sealed source (estimated calibration date 1982) remained in Room 204 after the 1996 decommissioning. This source was removed by a Beckman Coulter, Inc. representative on November 2, 2006. It was then leak tested by PVAMC Health Physicist before it was packed for shipment and secured. The source was Federal Expressed on November 3, 2007 and received by Beckman Coulter, Inc on November 11, 2007. Copies of the Beckman Coulter, Inc Service Report, their NRC License and Returned Goods Authorization form are contained in **Attachment 3**

From 1996 until 2006, no known use of radioactive materials occurred. Use of Building 11's second floor stopped in the mid 1990s.

On January 25, 2006, 27 vials containing radioisotopes were found in Room 201. On January 27, one (1) vial containing radioactive material was found in Room 120. Calibration dates were not available for all sources, but those that were available ranged from July 1975 to September 1977 (Table 3). The identity of who purchased the sources and who placed them in the freezer remains unknown.

4. Survey Plan

As discussed previously, following the discovery of the radioactive materials, surveys were conducted in Rooms B01, 120, 201, 202, 204, and 206 on February 3, 2006. This survey consisted of scanning 100% of the benches and furniture in these rooms and about 25% of the floor using a pancake G-M detector. Wipes were taken at many locations as noted on Figures 2 to 5 and Tables 4 to 8. As a result of the historical review, the following additional surveys were conducted.

Survey of Room 100 in Bldg. 11: This room was reduced in size and the sink and lab bench were removed. Part of the room was made into a utility space and the rest was made into an office. In addition, carpeting was installed on the floor. The principal survey method was with a Geiger counter with a pancake probe, which will detect C-14. In addition, a few wipes were taken of the carpet and walls.

Survey of Sink Traps and Hood Vents in Rooms 203, 204 *and 110:* Since disposal by sink was reported in rooms 203 and 204, wipes were taken in the insides of the drains and inside the hood vents. According to facility personal, the drain lines go directly to the municipal sewer line and there are no holdup tanks. Therefore, surveying the drain lines at the sink was considered to be adequate characterization. Although it is not known if radioactive materials were ever used in Room 110, it has a sink, so a wipe was done there also.

S*urvey of Animal Facility:* The animal facility survey was done in two stages. A preliminary survey was done on April 6 and included the floor drains, the sinks, if present, and 2 to 5 wipes on the floor. Additional surveys were performed on September 28 and October 4, 2006, which

consisted of wipes taken of the floor using a grid pattern. Except for Room B01A, these rooms contain only animal cage racks. Since these racks are washed frequently, the likelihood of any contamination remaining on them is extremely unlikely. As a result the cages were not surveyed.

MARSSIM type survey. NUREG-1575, Revision 1, August 2000 "Multi-Agency Radiation Survey and Site Investigation Manual" (MARSSIM) is the primary reference used for surveys. Because of the slight chance that radioactive materials may have been used in other areas of the Building, a MARSSIM type survey was conducted at random locations in Building 11. The design of this type of survey is discussed in the next section.

Following a request to dispose the freezer used to store radioactive animal carcasses, the former radioactive waste storage Room, B01A, and freezer were resurveyed on March 9, 2007.

5. Implementing the MARSSIM Process

The MARSSIM process may be subdivided as follows:

1. determine release criteria
2. classify area by contamination potential
3. define survey units
4. select instruments and survey techniques
5. perform final survey
6. analyze results

Each of these steps is discussed below and how it was followed during this decommissioning survey.

5.1 Release criteria – The potential contaminants, H-3 and C-14, are both low-energy beta emitters. They do not emit any gamma radiation. I-125 has a 60 day half-life and so will have decayed away since 1989. Traditionally release criteria for building surfaces have been based on NRC Regulatory Guide 1.86. The 1996 Decommissioning Report references NRC Regulatory Guide 8.23, "Radiation Safety Surveys at Medical Institutions" which uses the same values as Regulatory Guide 1.86.

The release criteria for H-3 and C-14 is:

Total activity	5000 dpm/100 cm^2 averaged over 1 m^2
Maximum activity	15,000 dpm/100 cm^2
Removable activity	1000 dpm/100 cm^2

(dpm is disintegrations per minute)

Note 1: In 1998, the NRC published dose-based release criteria for building surfaces for specific radioisotopes (NRC, 1998). These criteria were reproduced in NUREG 1757, Vol. 1, Appendix B. For the two long-lived radionuclides used in Bldg. 11, H-3 and C-14, the values for total surface activity are:

H-3 1.2×10^8 dpm/100 cm^2

C-14 3.7×10^6 dpm/100 cm^2

For conservatism, and to be consistent with the release criteria in effect at the time of operation, Regulatory Guide 1.86 release limits are being used for this report. Use of either of the above limits would result in minimal risk to the public and employees if a small area were found to exceed the above Regulatory Guide 1.86 limits.

Note 2: The MARSSIM method does not include wipe tests, but they were used for the 2006-2007 decommissioning process because wipe tests are the only practical way to detect and measure Tritium (H-3). Also the most sensitive radiation detectors (survey meters) available to be used for area surveys cannot detect H-3 and are not sensitive enough to ensure that surface activities are below the release criteria for C-14.

While the primary release limit, or in MARSSIM terminology, the derived concentration guideline level (DCGL), is 1000 dpm/100 cm^2 for wipe results, two additional release criteria were used for the 2006 Decommissioning evaluation: 1) Any exposure reading above background measured with the survey meter will be considered to exceed the limit for total surface activity and the surface must be decontaminated and re-tested.. 2) Any wipe test exceeding 10% of the 1000 dpm/100cm^2 limit will be re-evaluated, the area decontaminated if necessary, and re-swiped.

5.2. Area Classification – MARSSIM specifies that all areas being investigated should be classified by contamination potential. There are four classes:

Class 1 – areas that have, or had prior to remediation, the potential for contamination that is expected to exceed release limits.

Class 2 – areas that have, or had prior to remediation, the potential for contamination but are not expected to exceed the release limits.

Class 3 – areas that may have contamination, but it is expected to be a small fraction of release limits.

Non-impacted – areas that have no reasonable potential for contamination.

To assist with determining the appropriate Area Classification, the 1996 Decommissioning Report results for Bldg. 11 were reviewed and compared to the February 2006 results. A combined total of 322 swipe tests were taken in 19 rooms for the 1996 and the February 2006 surveys. In 1996, a wipe test of a sink in Room 204 had Tritium levels above background, but well below the release criteria. All results found in February 2006 room surveys were either below background or a small fraction of the release limits, which supports the findings in 1996 as well as the conclusion that conditions have not changed. Therefore expectations were that contamination would not be found, but if it were found, it would be a small fraction of release limits. While classifying the offices as "Non-impacted" could be justified, the presence of radioactive sources in two different areas presented the possibility that contamination could be present. As a result, all of Bldg. 11 is considered as Class 3 for this report.

5.3. Survey unit – MARSSIM groups survey points into survey units. These are areas naturally distinguishable from the remainder of the site for which a pass or no-pass decision can be made. For example, inside a building, a survey unit can be a room or group of rooms or a floor. Exterior areas such as the site of a former pit or tank can be survey areas. Survey units are limited in size in MARSSIM for structures as follows:

Class 1	floor area less than 100 m^2
Class 2	floor area between 100 to 1000 m^2
Class 3	no limit

The floor area in Bldg. 11 is about 560 m^2 per floor for a total area of about 1700 m^2. For a class 3 area, it is reasonable to define each floor as a separate survey unit. Therefore, there were three survey units.

5.4. Instrument Selection and Survey Techniques – Table 5.9 in MARSSIM recommends the following survey coverage for indoor Class 3 areas.

Surface scan – portions of the interior surfaces should be scanned with an appropriate radiation meter. The location of areas to be scanned will be based on judgment. A review of Table 5.9 implies that the area to be scanned is on the order of 10% of the total surface area.

Surface activity measurement – The number of surface activity measurements, in this case, wipe tests, were determined using the statistical tests in Sections 5.5.2.2 or 5.5.2.3. NUREG-1575 (MARSSIM report).

5.4.a. Surface Scans

Surface scans are limited to detecting and measuring radiation exposure from contamination on a surface from radioisotopes that emit gamma radiation or moderate to high energy beta radiation. One of the two radioisotopes found was Tritium (H-3). It's beta energy is too low to be detected by any available survey meter. The other radionuclide, C-14, can be detected, but the survey meter is not sensitive enough to indicate if the C-14 activity on a surface is below the release criteria. The calculated minimum detectable activity (MDA) for a pancake G-M probe used for scanning is about 18,000 dpm/100 cm^2 (see Abelquist, p. 201). This exceeds the 5,000 dpm/100 cm^2 release limit. According to NUREG-1507, the MDA can be reduced to about 3500 dpm/100 cm^2 by holding the pancake probe still and taking one-minute counts. However, PVAMC's pancake detectors are not calibrated to dpm, they are calibrated to mR/hr since they are ratemeters, not scalers. As a ratemeter, it cannot accumulate counts for one minute.

Therefore, the primary survey technique chosen for both H-3 and C-14 removable contamination was to take wipe tests and analyze them in a liquid scintillation counter (LSC). The MDA for Philadelphia VAMC's LSC is 33 dpm for H-3 and 24 dpm for C-14 (based on one-minute counts). Spot area surveys were performed by using a Geiger-counter with a pancake probe. Areas surveyed were selected based on surveyor's best judgment of where H-3 and C-14 were used in the labs, the waste storage room, and the

animal rooms. Any area exposure reading above background was to be noted and that area would be investigated further by taking wipe samples

5.4.b.Determine Number of Survey Points

The number of survey points was estimated using Table 5.5 in MARSSIM. This table is the appropriate table to use when the contaminant being measured is not present in the background. This is true because we can determine the radionuclide specific count rate in the LSC. To use Table 5.5, one must select the error parameters, alpha and beta. These are selected based on the tolerance of the regulators and the investigators for errors in either rejecting a survey unit if it is clean or accepting a survey unit if it is contaminated. Although one could argue that the risk to the public of accepting a dirty survey unit is small because of the very low dose that would result, we will conservatively select the smallest values of alpha and beta. In addition, we also need to determine the relative shift, which is:

Relative shift = (DCGL – LBGR)/sigma

where:

DCGL = release criteria, or 1000 dpm/100 cm^2 for wipes

LBGR = lower bound of gray region, or the median of the swipe measurements (see Abelquist, page 272), for both the H-3 and C-14 swipes, the average value after background is subtracted is about 0.

Sigma = standard deviation of measured data. This was 5 for C-14 and 16 for H-3 for the 2006 survey.

The relative shift is 30 for H-3 and 200 for C-14, well above the largest value on Table 5.5 of NUREG-1575 which is 3.0. Therefore, the conservative approach is to use the row for relative shift equal to 3.0. This results in 27 required number of sample points.

A requirement for using the statistical methods contained in MARSSIM is that survey points are randomly located. There are a number of ways to select locations. The method selected was to use a random number generator in Microsoft Excel.

5.5 Final Survey Procedure

As detailed above, the final survey consisted of taking 27 wipes per floor for a total of 81 wipes. The wipes were counted on the LSC at PVAMC and results analyzed for H-3 and C-14 contamination levels. The locations of the wipes were based on a random number generator in Microsoft Excel. In addition, a pancake G-M was used to scan select areas. More surfaces were scanned in laboratories than offices. The floors and bench-tops were spot-checked. All sink drains and hoods were completely scanned. PVAMC's pancake G-M detectors are calibrated for exposure rate (mR/hr), not count rate. However, any elevated locations based on audible signal were to be marked and further investigated. At a minimum, wipes were to be taken at those locations.

5.6 Analysis of Results

The Sign Test described in Chapter 5 of MARSSIM can be used to analyzed the results because the potential contaminants are not present in the background. However, if every result is less than the release criteria, the survey unit meets the release criteria per Table 8.2 of

MARSSIM and no statistical analysis is required. Since all results were well below release criteria, no statistical analysis is provided in this report.

6. Survey Method Implemented

As indicated above, area surveys were done with a Geiger counter plus pancake probe survey meter and removable contamination was evaluated by taking wipes which were counted on a LSC. The Geiger counter (G-M) survey meter is a Ludlum Model 3 ratemeter with Model 44-9 pancake probe. It is calibrated annually and source-checked on the days used. The wipe samples were counted on a Beckman LS 6500 liquid scintillation counter located at the Philadelphia VAMC. This analytical instrument is calibrated annually and its counting efficiency is measured monthly. Each wipe sample was counted at three beta energy ranges corresponding to H-3, C-14, and P-32 beta energies. Additional instrument information is provided in Table 2.

Extensive area surveys for radiation exposure rates above background were performed using G-M survey meter in Rooms 120, 201, 202, 204, and 206 as part of the immediate response. The G-M probe was passed slowly over equipment and bench tops and the rate of audio response was noted. During subsequent visits, G-M surveys were conducted at sinks and drains and random locations on the floor in the animal facility and at random locations throughout the building.

To determine removable contamination levels, filter paper was used as the wipe test device. Filter paper wipe samples were placed in plastic containers and counted on the Philadelphia VAMC liquid scintillation counter. During the February 3, 2006 survey, wipes were taken at locations as shown on the floor plans in **Figures 2 through 5** for rooms 120, 201, 202, 204, and 206. The wipes on the floor were equally spaced on an approximate grid pattern. Additional wipes were taken in the hallway outside room 202 and in the waste storage room B01A. At least 30 wipe samples per room were taken in Rooms 120, 201, and 202 because the radioactive sources were discovered or stored there. During subsequent visits, wipe samples were taken inside the sink drains and hoods in rooms 110, 203 and 204. In the animal facility (rooms B3 – B11) a wipe was taken at each floor drain and sink, if present, and 2-6 floor wipes were taken at random locations during the April 6, 2006 survey. And wipes were taken using an approximate one-meter sized grid on the floor during the Sept./Oct. 2006 survey (see Figure 6). Wipes were also taken at random locations throughout the building for the MARSSIM type survey. Several wipes were taken on the carpeted floor and walls in Room 100 during the October 2006 visit.

Microsoft Excel was used to generate random locations for the MARSSIM type survey. If the random location was for an inaccessible area, such as a utility space, the next location on the list of random locations was substituted. The coordinates for each location are given in the tables of the survey results for the MARSSIM survey in Table 11. Figure 7 indicates the coordinate setup.

On March 9, 2007, 15 additional wipes and area surveys using a Geiger counter were taken in the former rad waste storage room and of the freezer used to store radioactive animal carcasses, Room B01A (see Figure 8) to verify that the freezer could be removed for disposal.

7. Results of 2006-2007 Survey

Only the glass vials containing the H-3, C-14 and decayed I-125, the associated plastic bags and cardboard box that had contained the vials had removable H-3 activities which exceeded 10% of the 1000 dpm/100 cm^2 removable activity limit. All equipment, including the freezer in which the vials were found, as well as room surface wipe test results were close to, or less than, background. **Table 4** has the results of the wipe tests of the vials and the box. The highest readings were from wipes of the glass vials, some of which were significantly contaminated with H-3. The highest wipe test result was 13,106 dpm/100 cm^2. The cardboard box was slightly contaminated but the wipe result was below the release guidelines. The cardboard box, all vials and associated plastic bags were disposed of as radioactive waste. This waste was picked up by the waste broker, Radiac, Inc., on April 13, 2006. Radiac transferred the waste to Duratek for processing and then it was disposed at Envirocare. Disposal documentation is included in **Attachment 4.**

Tables 5 through 8 present the results of the wipe tests in rooms 120, 201, 202, 204, 206, and B01A. All wipe results are close to background levels and well below the release limits.

Table 9 gives the results of the preliminary wipe surveys in the animal facility on April 6, 2006. Wipes were done in rooms B03 to B11. Room B21, which is not part of the animal facility was also surveyed because it is a lab. All wipe results are at background levels and well below the release limits.

Table 10 presents the results of the survey in the animal facility floor on a grid pattern on September 28 and October 4, 2006. All wipe results are close to or below background levels and well below the release limits.

Table 11 is the results of the MARSSIM type survey at random locations throughout the entire building. All wipe results are close to or below background levels and well below the release limits. No statistical analysis of the results is necessary to demonstrate compliance with the release criteria.

Table 12 is the results of the wipes taken in sink drains and hood vents in the rooms in which radioactive materials may have been used and there is still sinks – Rooms 110, 203, and 204. In addition, the results for the carpet and walls in Room 100 are also given. All wipe results are below or close to background levels and are well below the release limits.

Table 13 is the results of the resurvey in the former rad waste storage room, B01A. All wipe results are close to or below background levels and are well below the release limits.

All area radiation exposure levels measured with a pancake G-M probe and ratemeter were at background levels based on listening to the audio response. The background exposure rate measured outside the building was 0.03 mR/hr.

8. Conclusion

Except for the 28 vials containing the H-3, C-14 and decayed I-125, the associated containers, plastic bags and cardboard box, no radioactive contamination was found in the rooms surveyed in Bldg 11. Low level contamination inside the box was most likely due to evaporation from vials

found inside the storage box, rather than from any overt leakage. The vials, container, plastic bags and cardboard box were secured, and held until they were transferred to a commercial broker for disposal as radioactive waste.

The Cesium-137 source inside the Liquid scintillation counter was removed by the manufacturer and transferred to the manufacturer. Leak test and removal documentation is included in **Attachments 2 and 3.**

9. VA National Health Physics Closeout Survey Questionnaire

Attachment 5 is the completed Questionnaire for this survey.

10. References

Abelquist, E.W., Decommissioning Health Physics: A Handbook for MARSSIM Users, Institute of Physics, 2001

Coatesville VA Medical Center Decommissioning Report, June 1996, prepared by Philadelphia VA Medical Center Radiation Safety Office Staff.

NUREG-1575 Multi-agency Radiation Survey and Site Investigation Manual (MARSSIM), Revision 1, 2000

NUREG-1507, Minimum detectable concentrations with typical radiation survey instruments for various contaminants and field conditions, NRC, 1997

NUREG-1557, Volume 1, Consolidated Decommissioning Guidance, Decommissioning Process for Materials Licensees

NUREG-1557, Volume 2, Characterization, Survey, and Determination of Radiological Criteria

NRC, 1998, Federal Register Note, Nov. 18, 1998

Part D

Figures

Building 11

Figure 1
Photo of Room 202, Building 11, showing freezer containing vials

Figure 2

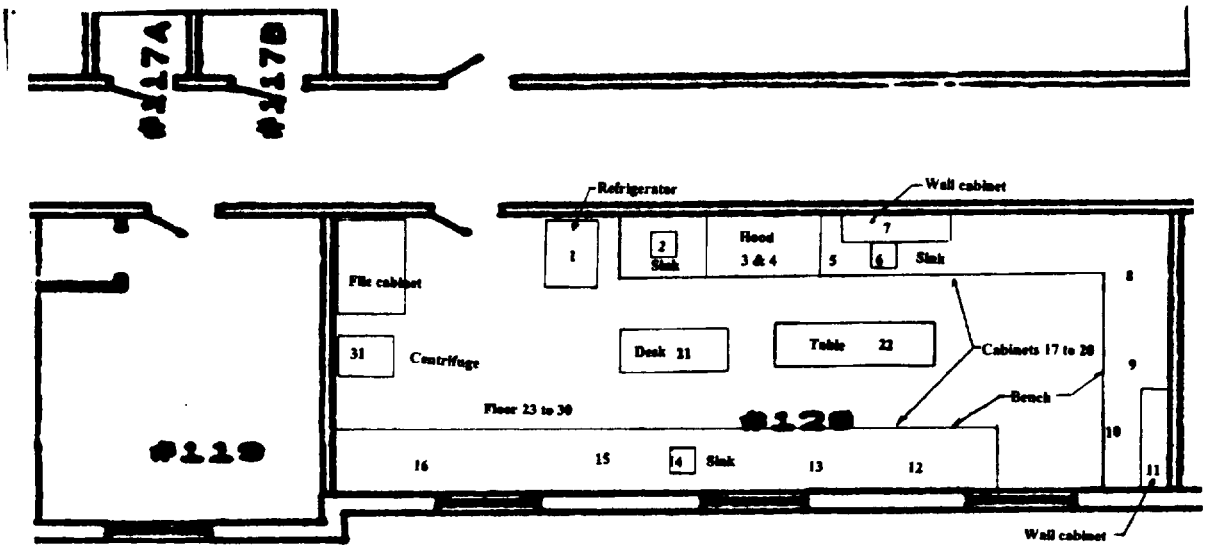

Figure 2

Bldg. 11, Room 120

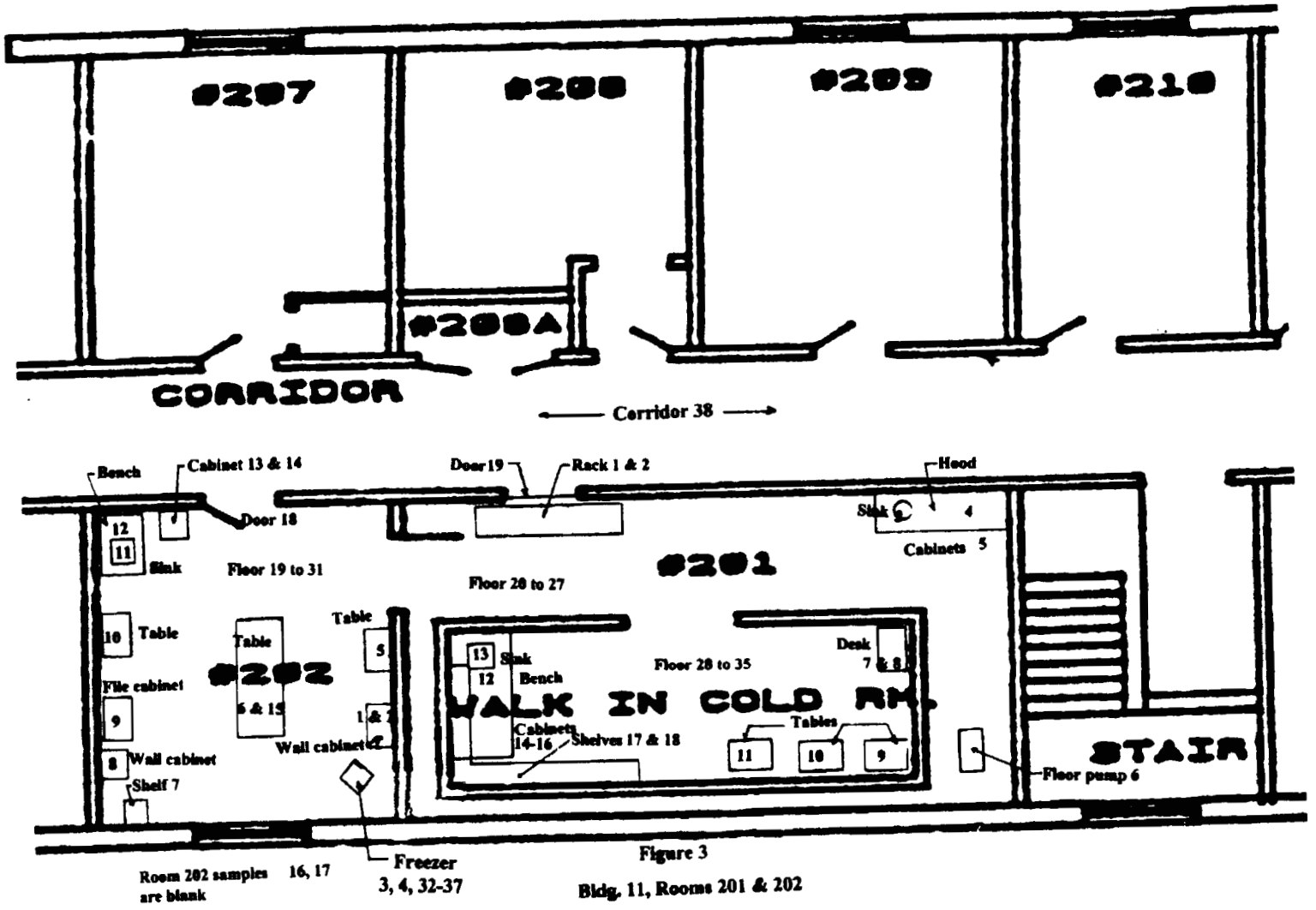

Figure 3

Bldg. 11, Rooms 201 & 202

Figure 3

Figure 4

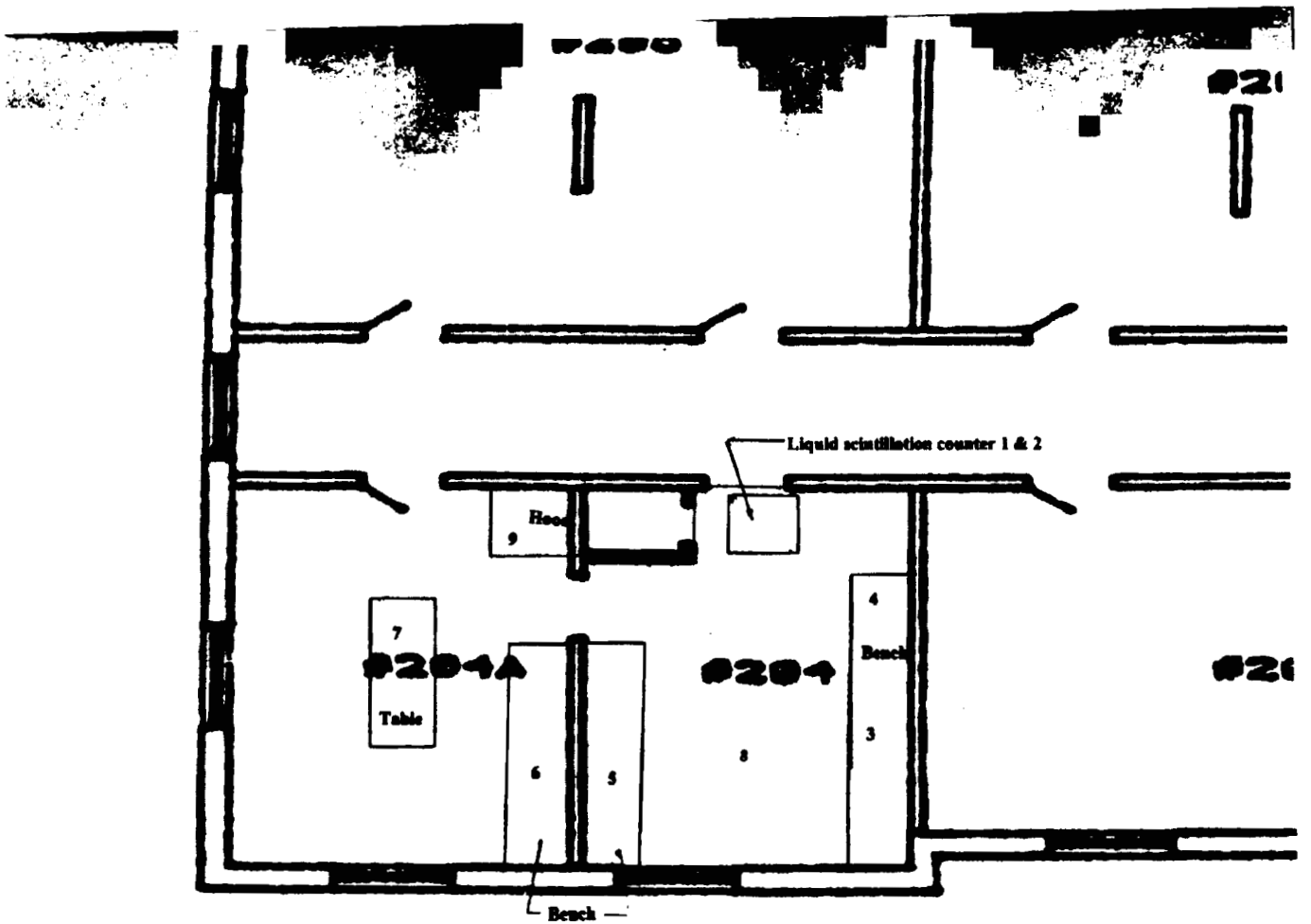

Figure 4

Bldg. 11, Rooms 204 & 204A

Figure 5

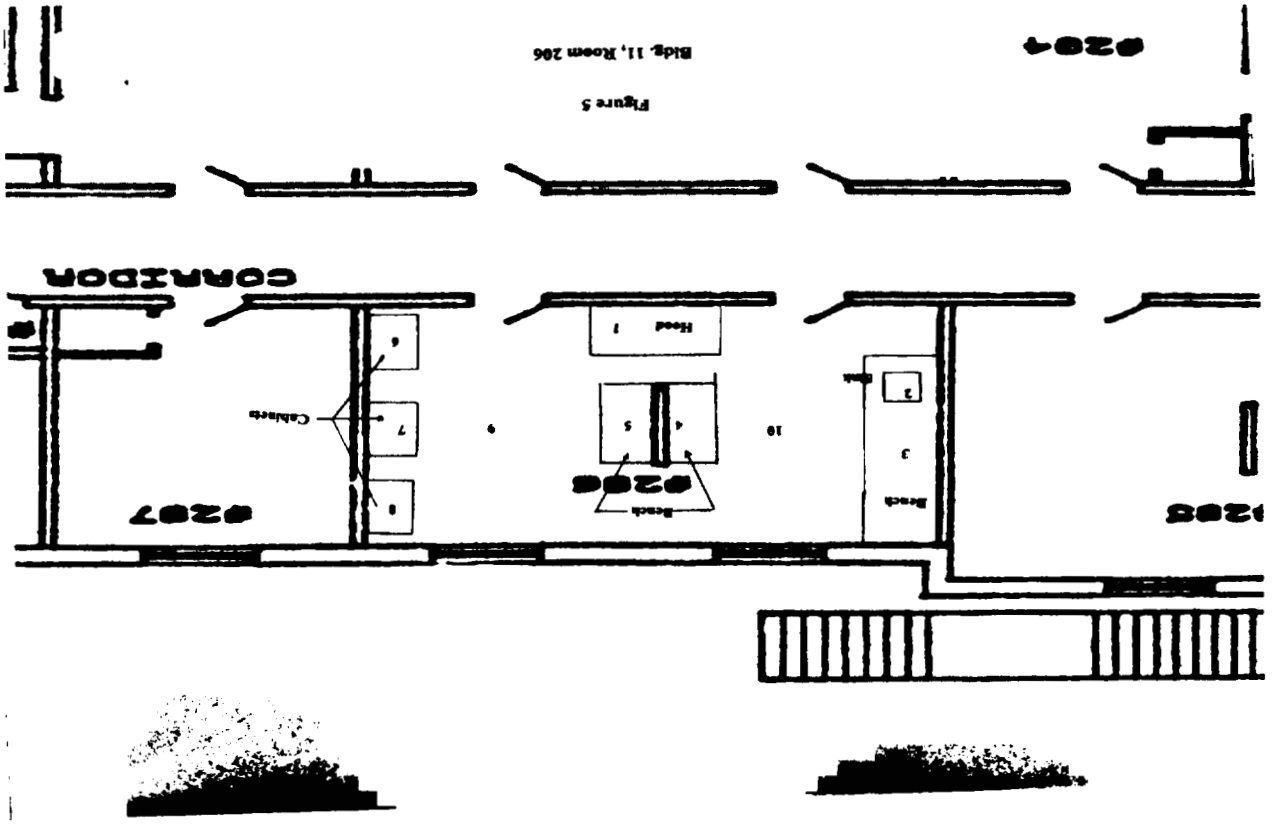
Bldg. 11, Room 206
Figure 5
0204
Desk
3
Desk
10
Desk
0206
Desk
1
9
Cabinets
7
6
0207
CORRIDOR

Figure 6

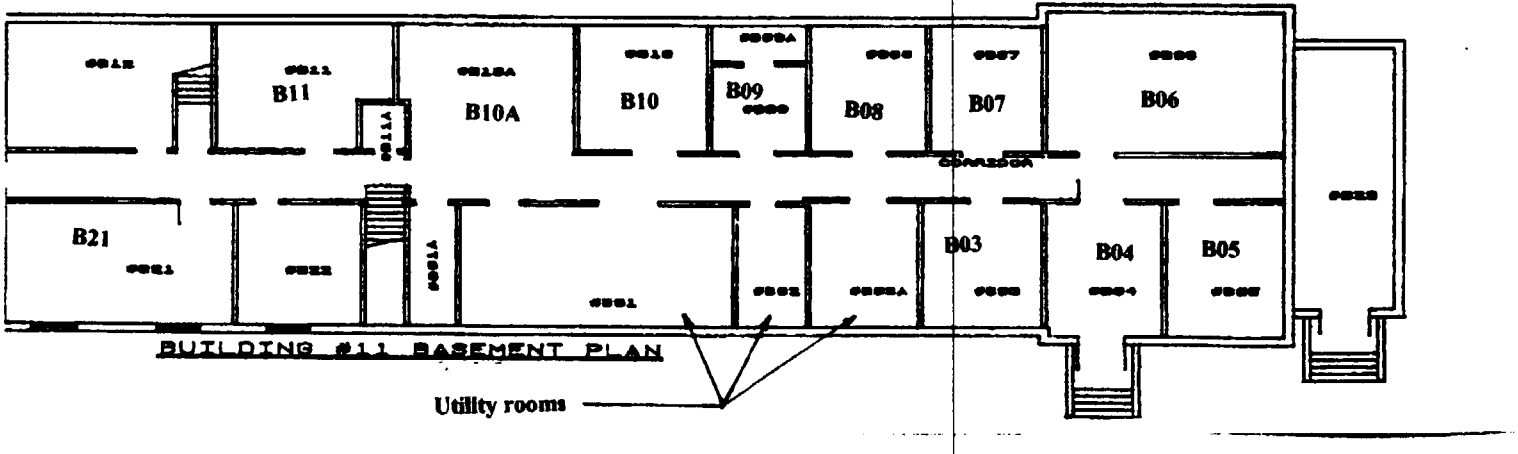

Figure 6

Animal Facility

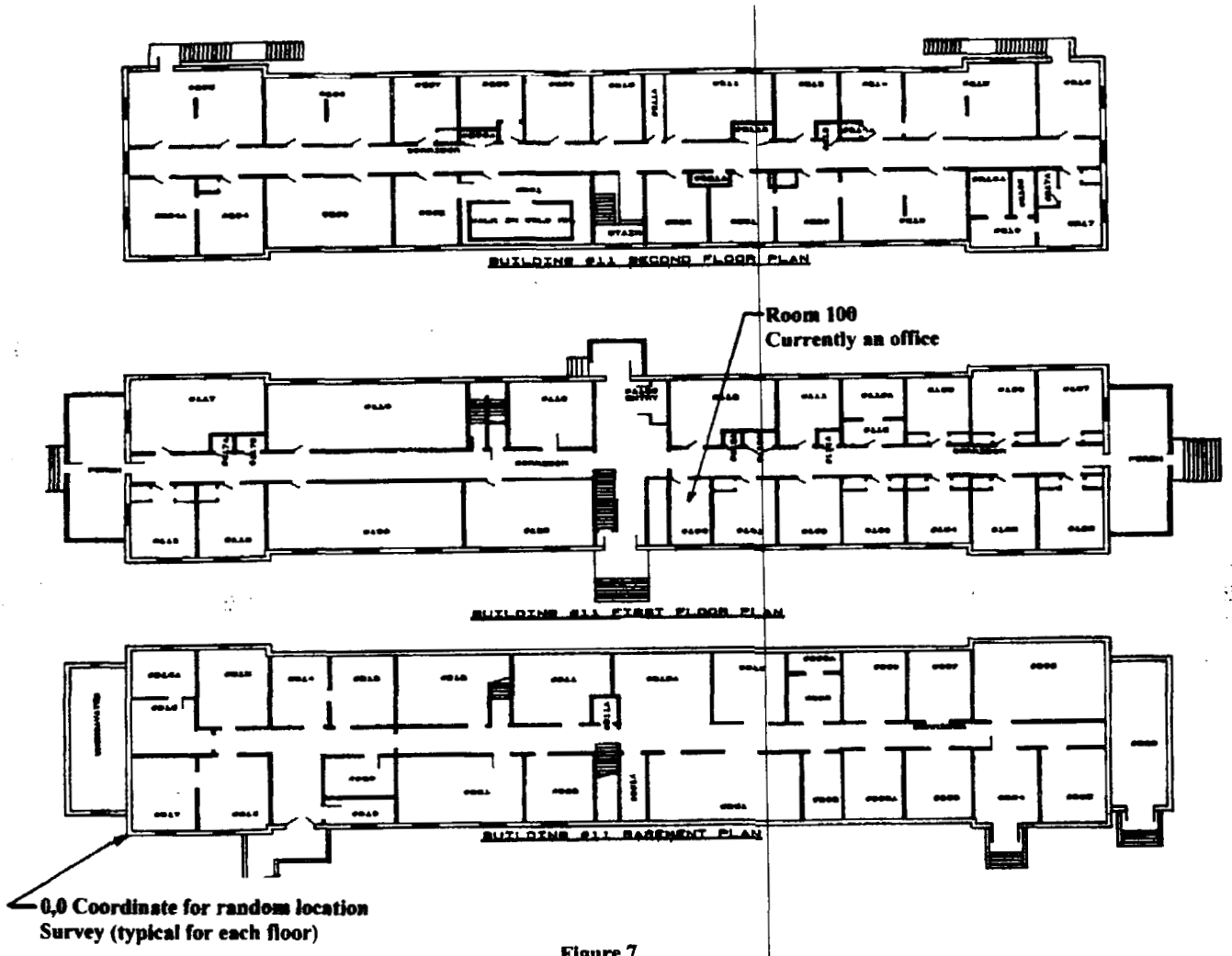

Figure 7

Building 11

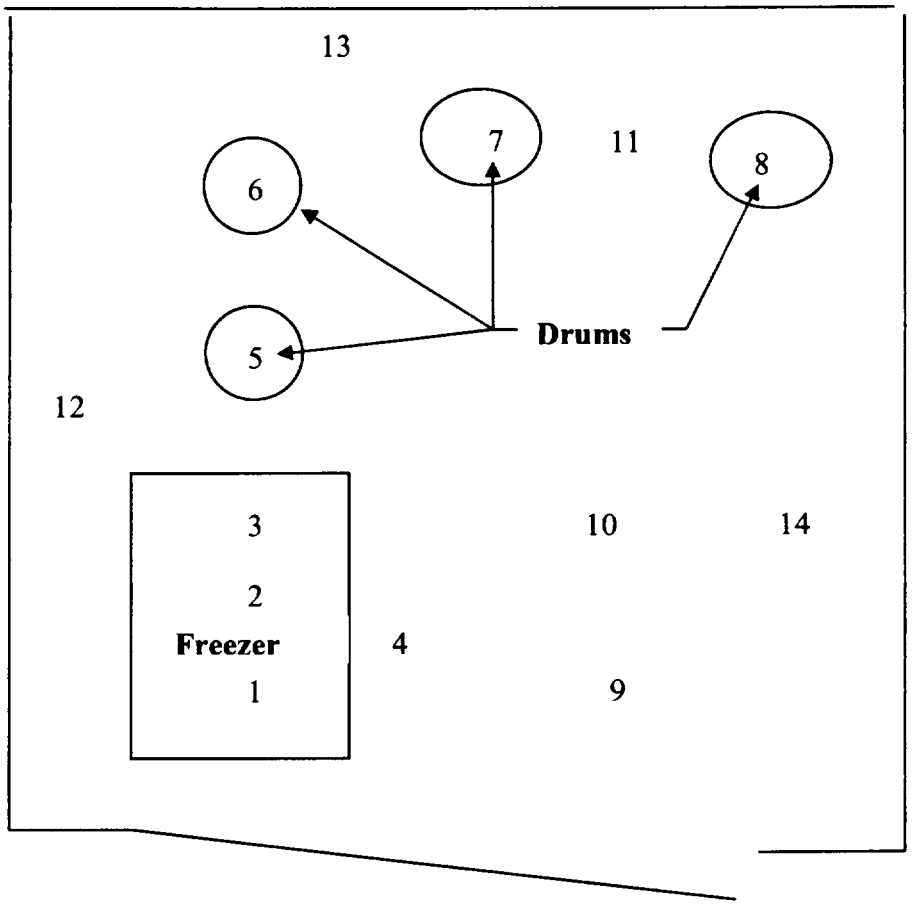

Figure 8

Bldg. 11, Room B01A

Part E

Tables

of

Survey Results

Table 1

Summary of Decommissioning Surveys
Coatesville PVAMC

Date	Rooms surveyed	Number of survey locations
	2006 - 2007	
February 3, 2006	Bldg. 11 Rooms B01, 120, 201, 202, 204, and 206	127
April 6, 2006	Bldg. 11, Rooms B3-B11, B21, and 202 (after waste removed) .	53
September 28 and October 4, 2006	Bldg. 11, Sink Drains and Hoods in Rooms 110, 203, and 204; Rooms B3-B11, 100, and random locations throughout bldg.	240
March 9, 2007	B01A Freezer and Room	15

	1996	
February & April 1996	Nuclear Medicine in Bldg. 59 and Rooms B01A, 110, 203, and 204 in Bldg. 11	142

Table 2

Survey and Analysis Equipment

Instrument Type	Model	Purpose	Count time	MDA
Portable detector Geiger-Counter with Pancake Probe	Ludlum Model3 ratemeter with Model 44-9 probe	Measures beta surface activity. Also detects gamma radiation	Operated in scanning mode	20,000 dpm/100 cm^2
Liquid Scintillation Counter analytical equipment	Beckman LS 6500	Measures removable beta activity by counting filter paper wipes	1 minute	33dpm for H-3 24dpm for C-14 13dpm for P-32

Minimum detectable activity (MDA)

For liquid scintillation counter: $MDA = (3 + 4.65\ (C_B)^{1/2})/KT$

Where C_B = Background counts (12cpm for H-3 and C-14; 4.5cpm for P-32)
K = Detector efficiency (57.7% for H-3; 79.9% for C-14; 100% for P-32)
T = Counting time (1 minute)

For pancake G-M: $MDA = 3\ C_B/(K*(A/100))$

Where A = detector area (cm^2),
pancake probe's detector area is 15 cm^2

The above equations are taken from NRC document "Manual for Conducting Radiological Surveys in Support of License Termination", NUREG/CR-5849, draft

Table 3
Inventory of vials found in Rooms 202 & 120, Building 11
3-Feb-06
(Isotope, chemical form, activity, and date are taken from vial or container label)

Container	Isotope	Chemical form	Activity	Date
Vials found in Room 202				
1	H-3	Adenosine	0.25mCi	9/20/1976
2	H-3	ATP		7/8/1975
3a[1]	H-3	Leucine	1.0 mCi	6/221976
3b	H-3	Leucine	1.0 mCi	6/22/1976
4	C-14	Leucine	5.0 mCi	No date
5	H-3	Cytidine	1.0 mCi	No date
6	C-14	L-amino	1.0 mCi	No date
7	H-3	Leucine	5.0mCi	9/20/1976
8	H-3	Adenosine (ATP)	0.25mCi	9/20/1976
9	C-14	Hydroxyptrytanine	0.05 mCi	No Date
10	H-3	ATP	1.0 mCi	No Date
11	H-3	ATP	0.25mCi	9/20/1976
12a[1]	H-3	#1 Adenosine	1.0mCi	No Date
12b	H-3	#2 Cytidine	1.0mCi	No Date
13	C-14	L-Amino Acid Mix	0.25mCi	9/26/1977
14	H-3	Adenosine	0.25mCi	9/30/1976
15	H-3	Adenosine	0.25mCi	9/20/1976
16	H-3	L-Amino Acid	1.0mCi	9/8/1975
17	H-3	L.A.A. Mix (ph 7.8)	1.0mCi	9/9/1975
18	H-3	Adenosine	5.0mCi	7/18/1975
19	C-14	B Ethyl	0.25mCi	No Date
20	H-3	Guanosine	1.0mCi	7/8/1975
21	H-3	L-Phenylalasine	1.0mCi	7/8/1975
22	H-3	Cytidine	1.0mCi	7/8/1975
23	I-125	Cyclic AMP Antigen	1.0uCi	No date
24	I-125	Cyclic AMP Antigen		10/20/1976
25	C14	L-leucine	0.01mCi	No date
Vial found in Room 120				
26	H-3	Kaintic Acid	0.25mCi	No date

Notes:

1. Containers 3 and 12 each had two vials. Only one wipe was taken of the two vials.

Table 4
Survey Results - Vials & Box found in Rooms 202 & 120, Building 11

Performed February 3, 2006

	H-3		C-14		P-32	
Container	**cpm/100 cm^2**	**dpm/100 cm^2**	**cpm/100 cm^2**	**dpm/100 cm^2**	**cpm/100 cm^2**	**dpm/100 cm^2**
1	66	114	9	11	1	1
2	1165	2019	4	5	-3	-3
3	6099	10570	57	71	-1	-1
4	1443	2501	8	10	0	0
5	76	132	2	3	1	1
6	54	94	22	28	-2	-2
7	7562	13106	0	0	-2	-2
8	271	470	25	31	2	2
9	170	295	57	71	-1	-1
10	948	1643	4	5	-2	-2
11	221	383	3	4	1	1
12	154	267	4	5	0	0
13	3	5	20	25	1	1
14	77	133	8	10	-1	-1
15	61	106	2	3	4	4
16	80	139	12	15	-4	-4
17	104	180	-5	-6	-1	-1
18	209	362	6	8	0	0
19	155	269	5	6	-2	-2
20	61	106	4	5	-1	-1
21	364	631	14	18	1	1
22	170	295	-5	-6	-1	-1
23	57	99	1	1	1	1
24	54	94	-6	-8	-1	-1
25	43	75	3	4	-1	-1
26	21	36	1	1	2	2
Box	164	284	-8	-10	1	1

Notes:
1. cpm is counts per minute, dpm is disintegrations per minute
2. Results for blank have been subtracted from each result
3. dpm = cpm/efficiency, where efficiency is 0.577 for H-3, 0.799 for C-14, and 1.0 for P-32

Table 5
Survey Results - Room 120, Building 11
Performed February 3, 2006

	H-3		C-14		P-32	
Location	**cpm/100 cm^2**	**dpm/100 cm^2**	**cpm/100 cm^2**	**dpm/100 cm^2**	**cpm/100 cm^2**	**dpm/100 cm^2**
1	7	12	-3	-4	-4	-4
2	4	7	1	1	-1	-1
3	17	29	1	1	-1	-1
4	3	5	5	6	-2	-2
5	15	26	-2	-3	-1	-1
6	12	21	-2	-3	3	3
7	8	14	-3	-4	0	0
8	10	17	-1	-1	1	1
9	13	23	-4	-5	-2	-2
10	11	19	1	1	-5	-5
11	9	16	4	5	3	3
12	16	28	2	3	-1	-1
13	16	28	-4	-5	6	6
14	7	12	0	0	-2	-2
15	10	5	-5	-6	4	4
16	5	7	2	3	1	1
17	7	19	-4	-5	-1	-1
18	19	13	-2	-3	-4	-4
19	13	4	4	5	1	1
20	4	6	-1	-1	2	2
21	6	6	4	5	0	0
22	6	15	-1	-1	2	2
23	15	11	0	0	2	2
24	11	14	-1	-1	-2	-2
25	14	9	4	5	-1	-1
26	9	7	1	1	-2	-2
27	7	7	1	1	-1	-1
28	7	9	3	4	-3	-3
29	8	14	-2	-3	0	0
30	4	7	-3	-4	0	0
31	12	21	-2	-3	-2	-2

Notes:
1. cpm is counts per minute, dpm is disintegrations per minute
2. Results for blank have been subtracted from each result
3. dpm = cpm/efficiency, where efficiency is 0.577 for H-3, 0.799 for C-14, and 1.0 for P-32

Table 6
Survey Results - Room 201, Building 11
Performed February 3, 2006

	H-3		C-14		P-32	
Location	**cpm/100 cm²**	**dpm/100 cm²**	**cpm/100 cm²**	**dpm/100 cm²**	**cpm/100 cm²**	**dpm/100 cm²**
1	4	7	-2	-3	0	0
2	4	7	-2	-3	0	0
3	4	7	-4	-5	0	0
4	-4	-7	6	8	2	2
5	8	14	1	1	-2	-2
6	8	14	1	1	-2	-2
7	1	2	2	3	-2	-2
8	3	5	-3	-4	-3	-3
9	0	0	2	3	2	2
10	5	9	-2	-3	-1	-1
11	4	7	-3	-4	-2	-2
12	2	3	-2	-3	-3	-3
13	10	17	-1	-1	-3	-3
14	12	21	-7	-9	-2	-2
15	4	7	-1	-1	0	0
16	10	17	4	5	-1	-1
17	11	19	1	1	3	3
18	2	3	-4	-5	-2	-2
19	4	7	1	1	-3	-3
20	5	9	-1	-1	-3	-3
21	3	5	-5	-6	-1	-1
22	3	5	-1	-1	-1	-1
23	10	17	4	5	-4	-4
24	9	16	0	0	1	1
25	4	7	-4	-5	-1	-1
26	7	12	3	4	7	7
27	8	14	-1	-1	0	0
28	3	5	1	1	-1	-1
29	18	31	1	1	-1	-1
30	-2	-3	0	0	-1	-1
31	7	12	4	5	3	3
32	6	10	-2	-3	0	0
33	8	14	4	5	-2	-2
34	6	10	-6	-8	-3	-3
35	11	19	5	5	-1	-1

Notes:
1. cpm is counts per minute, dpm is disintegrations per minute
2. Results for blank have been subtracted from each result
3. dpm = cpm/efficiency, where efficiency is 0.577 for H-3, 0.799 for C-14, and 1.0 for P-32

Table 7
Survey Results - Room 202 and Hallway, Building 11
Performed February 3, 2006

	H-3		C-14		P-32	
Location	**cpm/100 cm²**	**dpm/100 cm²**	**cpm/100 cm²**	**dpm/100 cm²**	**cpm/100 cm²**	**dpm/100 cm²**
1	2	3	-4	-5	-2	-2
2	12	21	3	4	-3	-3
3	1	2	-4	-5	-4	-4
4	5	9	-3	-4	-1	-1
5	4	7	-5	-6	-5	-5
6	12	21	1	1	-1	-1
7	6	10	-5	-6	-2	-2
8	4	7	-1	-1	0	0
9	3	5	3	4	-1	-1
10	5	9	-1	-1	5	5
11	10	17	-1	-1	-2	-2
12	12	21	1	1	4	4
13	15	26	-2	-3	-2	-2
14	7	12	-3	-4	-1	-1
15	10	17	-4	-5	1	1
16	15	26	8	10	0	0
17	11	19	-1	-1	3	3
18	11	19	-4	-5	-2	-2
19	11	19	6	8	-1	-1
21	12	21	-1	-1	-1	-1
21	17	29	-2	-3	-1	-1
22	6	10	1	1	-1	-1
23	6	10	-5	-6	4	4
24	10	17	2	3	-1	-1
25	11	19	7	9	3	3
26	17	29	-1	-1	2	2
27	6	10	-5	-6	-2	-2
28	8	14	-2	-3	1	1
29	7	12	0	0	0	0
30	11	19	1	1	-3	-3
31	13	23	7	9	-1	-1
32	18	31	-10	-13	-3	-3
33	4	7	-5	-6	-1	-1
34	48	83	4	5	-2	-2
35	32	55	-1	-1	0	0
36	17	29	-1	-1	0	0
37	21	36	4	5	-2	-2
38	34	59	-4	-5	0	0

Notes:
1. cpm is counts per minute, dpm is disintegrations per minute
2. Results for blank have been subtracted from each result
3. dpm = cpm/efficiency, where efficiency is 0.577 for H-3, 0.799 for C-14, and 1.0 for P-32

Table 8
Survey Results - Rooms 204, 206, B01A, Building 11

Performed February 3, 2006

	H-3			C-14			P-32	
Location	**cpm/100 cm²**	**dpm/100 cm²**		**cpm/100 cm²**	**dpm/100 cm²**		**cpm/100 cm²**	**dpm/100 cm²**
Room 204								
1	10	17		-2	-3		-1	-1
2	17	29		-1	-1		2	2
3	18	31		5	6		-3	-3
4	7	12		-8	-10		0	0
5	11	19		-3	-4		-3	-3
6	8	14		-3	-4		-4	-4
7	6	10		0	0		9	9
8	3	5		3	4		5	5
9	9	16		-4	-5		1	1
10	5	9		-2	-3		-1	-1
Room 206								
1	9	16		1	1		-4	-4
2	7	12		1	1		-1	-1
3	6	10		-4	-5		-3	-3
4	10	17		-1	-1		-2	-2
5	4	7		0	0		-2	-2
6	11	19		-7	-9		-3	-3
7	7	12		-4	-5		-3	-3
8	12	21		0	0		-4	-4
9	10	17		-4	-5		1	1
10	6	10		-3	-4		4	4
Room B01A								
1	5	9		6	8		1	1
2	22	38		0	0		1	1
3	10	17		-4	-5		0	0

Notes:
1. cpm is counts per minute, dpm is disintegrations per minute
2. Results for blank have been subtracted from each result
3. dpm = cpm/efficiency, where efficiency is 0.577 for H-3, 0.799 for C-14, and 1.0 for P-32

Table 9
Preliminary Animal Facility Survey
Performed April 6, 2006

	H-3		C-14		P-32	
Location	cpm/100 cm^2	dpm/100 cm^2	cpm/100 cm^2	dpm/100 cm^2	cpm/100 cm^2	dpm/100 cm^2
Room B3						
Sink	-2	-3	-8	-10	5	5
Floor drain	-2	-3	1	1	-3	-3
Floor 1	-2	-3	-3	-4	1	1
Floor 2	-1	-2	-4	-5	2	2
Room B4						
Sink	6	10	-3	-4	8	8
Floor drain	1	2	-5	-6	2	2
Floor 1	6	10	-7	-9	0	0
Floor 2	2	3	-5	-6	4	4
Room B5						
Sink	-2	-3	-1	-1	-1	-1
Floor drain	3	5	-6	-8	1	1
Floor 1	-5	-9	-7	-9	2	2
Floor 2	0	0	-2	-3	-1	-1
Room B6						
Cabinet	-3	-5	-8	-10	1	1
Sink	-1	-2	-3	-4	-1	-1
Floor drain	-1	-2	-4	-5	6	6
Floor 1	-1	-2	-2	-3	1	1
Floor 2`	4	7	-2	-3	0	0
Room B7						
Sink	2	3	-5	-6	2	2
Floor drain	0	0	-2	-3	4	4
Floor 1	3	5	-4	-5	4	4
Floor 2	7	12	-4	-5	2	2
Room B8						
Sink	1	2	1	1	3	3
Floor drain	0	0	-5	-6	4	4
Floor 1	0	0	-2	-3	2	2
Floor 2	-3	-5	-7	-9	6	6
Floor 3	4	7	2	3	7	7
Room B9						
Floor 1	-1	-2	-9	-11	4	4
Floor 2	6	10	-4	-5	0	0
Room B10						
Sink	-3	-5	1	1	6	6
Floor drain	2	3	-5	-6	1	1
Floor 1	-1	-2	-10	-13	2	2
Floor 2	-1	-2	-7	-9	-1	-1

Table 9 (continued)
Preliminary Animal Facility Survey
Performed April 6, 2006

	H-3			C-14			P-32	
Location	cpm/100 cm^2	dpm/100 cm^2		cpm/100 cm^2	dpm/100 cm^2		cpm/100 cm^2	dpm/100 cm^2
Floor 3	-1	-2		-8	-10		3	3
Room 10A								
Floor 1	-5	-9		-4	-5		5	5
Floor 2	3	5		-8	-10		1	1
Floor 3	0	0		-7	-9		7	7
Room 11								
Floor 1	4	7		-5	-6		3	3
Floor 2	1	2		-7	-9		-1	-1
Floor 3	1	2		-5	-6		6	6
Room 21								
Sm cabinet	-4	-7		1	1		3	3
Lg cabinet 1	3	5		-5	-6		0	0
Lg cabinet 2	4	7		-8	-10		1	1
Lab bench	-3	-5		1	1		3	3
Sink	-3	-5		-2	-3		1	1
Hood	3	5		-9	-11		0	0
Floor 1	-5	-9		-6	-8		-1	-1
Floor 2	4	7		-5	-6		3	3
Floor 3	-4	-7		-6	-8		4	4
Floor 4	1	2		-4	-5		0	0
Floor 5	-2	-3		-6	-8		2	2
Floor 6	10	17		-10	-13		5	5
Hallway								
1	2	3		-5	-6		0	0
2	0	0		0	0		8	8

Notes:
1. cpm is counts per minute, dpm is disintegrations per minute
2. Results for blank have been subtracted from each result
3. dpm = cpm/efficiency, where efficiency is 0.577 for H-3, 0.799 for C-14, and 1.0 for P-32

Table 10
Survey of Animal Facility Floor on Grid Pattern
Survey conducted September 28 and October 4, 2006

	H-3		C-14		P-32	
Location	cpm/ 100cm^2	dpm/ 100cm^2	cpm/ 100cm^2	dpm/ 100cm^2	cpm/ 100cm^2	dpm/ 100cm^2
B03A						
Floor 1	-6	-10	-4	-5	-8	-8
2	-2	-3	2	3	-7	-7
3	-9	-16	1	1	-4	-4
4	-4	-7	-5	-6	-3	-3
5	-6	-10	-3	-4	-6	-6
6	-5	-9	-1	-1	-9	-9
7	-8	-14	2	3	-5	-5
8	1	2	0	0	-7	-7
9	-6	-10	1	1	-5	-5
B03						
Floor 1	-1	-2	2	3	-4	-4
2	-11	-19	2	3	-6	-6
3	-2	-3	5	6	-7	-7
4	-6	-10	1	1	-8	-8
5	-3	-5	2	3	1	1
6	2	3	0	0	-7	-7
7	-4	-7	-3	-4	-2	-2
8	-6	-10	0	0	-7	-7
9	-3	-5	-1	-1	-8	-8
B04						
Floor 1	-9	-16	3	4	-6	-6
2	16	28	1	1	-9	-9
3	-5	-9	2	3	-6	-6
4	-7	-12	-4	-5	-8	-8
5	-3	-5	0	0	-6	-6
6	-5	-9	-2	-3	-7	-7
7	-2	-3	-1	-1	-7	-7
8	-8	-14	-2	-3	-6	-6
9	-6	-10	-6	-8	-7	-7
10	-9	-16	2	3	-9	-9
11	-5	-9	-2	-3	-6	-6
12	-7	-12	-4	-5	-8	-8
B05						

Table 10 (continued)
Survey of Animal Facililty Floor on Grid
Survey conducted September 28 and October 4, 2006

	H-3		C-14		P-32	
Location	**cpm/ 100cm^2**	**dpm/ 100cm^2**	**cpm/ 100cm^2**	**dpm/ 100cm^2**	**cpm/ 100cm^2**	**dpm/ 100cm^2**
Floor 1	-3	-5	2	3	-5	-5
2	-6	-10	0	0	-6	-6
3	-5	-9	1	1	-3	-3
4	-5	-9	0	0	-8	-8
5	-3	-5	5	6	-7	-7
6	-8	-14	6	8	-2	-2
7	-10	-17	-1	-1	-6	-6
8	-6	-10	-1	-1	-5	-5
9	-3	-5	-2	-3	-7	-7
10	-9	-16	-5	-6	-6	-6
11	-6	-10	2	3	-9	-9
12	-9	-16	4	5	-3	-3
B06						
Floor 1	-6	-10	-7	-9	-5	-5
2	1	2	-1	-1	2	2
3	-1	-2	-4	-5	2	2
4	3	5	-2	-3	0	0
5	-2	-3	-1	-1	1	1
6	5	9	-1	-1	-2	-2
7	2	3	-1	-1	-1	-1
8	2	3	2	3	3	3
9	1	2	-5	-6	1	1
10	3	5	-4	-5	-1	-1
11	-1	-2	-3	-4	1	1
12	1	2	0	0	4	4
13	5	9	-2	-3	0	0
14	1	2	-4	-5	-2	-2
15	0	0	5	6	-2	-2
16	3	5	1	1	1	1
17	-4	-7	-2	-3	0	0
18	4	7	-2	-3	-1	-1
19	-4	-7	6	8	1	1
20	0	0	2	3	-3	-3
21	-1	-2	2	3	0	0
22	4	7	-5	-6	-2	-2
23	4	7	2	3	-2	-2
24	-6	-10	-2	-3	6	6

Table 10 (continued)
Survey of Animal Facililty Floor on Grid

Survey conducted September 28 and October 4, 2006

	H-3		C-14		P-32	
Location	**cpm/ 100cm^2**	**dpm/ 100cm^2**	**cpm/ 100cm^2**	**dpm/ 100cm^2**	**cpm/ 100cm^2**	**dpm/ 100cm^2**
B07						
Floor 1	3	5	4	5	-1	-1
2	-3	-5	-5	-6	0	0
3	3	5	-5	-6	-3	-3
4	3	5	-1	-1	-3	-3
5	-4	-7	2	3	-3	-3
6	0	0	5	6	-2	-2
7	0	0	2	3	-5	-5
8	6	10	-1	-1	0	0
9	0	0	-1	-1	4	4
10	5	9	8	10	1	1
11	8	14	-2	-3	1	1
12	0	0	-2	-3	1	1
B08						
Floor 1	1	2	10	13	-3	-3
2	4	7	2	3	0	0
3	-3	-5	4	5	1	1
4	-4	-7	-3	-4	-1	-1
5	1	2	0	0	2	2
6	-2	-3	0	0	-2	-2
7	4	7	4	5	-1	-1
8	4	7	0	0	0	0
9	3	5	-1	-1	-1	-1
10	-2	-3	1	1	-3	-3
11	-2	-3	-2	-3	0	0
B09	2	3	-2	-3	-2	-2
Floor 1	0	0	3	4	-1	-1
2	0	0	2	3	-1	-1
3	3	5	4	5	-3	-3
4	0	0	3	4	-3	-3
5	1	2	-2	-3	-1	-1
6	-4	-7	-2	-3	0	0
B10						
Floor 1	2	3	5	6	-2	-2
2	-3	-5	2	3	0	0
3	-1	-2	0	0	0	0
4	1	2	2	3	1	1

Table 10 (continued)
Survey of Animal Facililty Floor on Grid

Survey conducted September 28 and October 4, 2006

	H-3		C-14		P-32	
Location	**cpm/ 100cm^2**	**dpm/ 100cm^2**	**cpm/ 100cm^2**	**dpm/ 100cm^2**	**cpm/ 100cm^2**	**dpm/ 100cm^2**
5	0	0	3	4	0	0
6	-4	-7	2	3	11	11
7	-1	-2	9	11	-2	-2
8	-4	-7	-2	-3	0	0
9	0	0	1	1	-2	-2
10	2	3	9	11	-2	-2
11	1	2	1	1	1	1
12	-3	-5	0	0	-2	-2
B10A						
Floor 1	-1	-2	0	0	-3	-3
2	-1	-2	0	0	0	0
3	-3	-5	-6	-8	0	0
4	2	3	2	3	-1	-1
5	4	7	4	5	-1	-1
6	-2	-3	3	4	1	1
7	-2	-3	-4	-5	-2	-2
8	0	0	-5	-6	-2	-2
9	-1	-2	2	3	-2	-2
10	2	3	1	1	2	2
11	0	0	-4	-5	3	3
12	-4	-7	3	4	1	1
13	-1	-2	7	9	2	2
14	-2	-3	1	1	-1	-1
15	-1	-2	1	1	-1	-1
16	2	3	-5	-6	0	0
17	3	5	3	4	-2	-2
18	7	12	-1	-1	-4	-4
19	-6	-10	-2	-3	-3	-3
20	-1	-2	9	11	1	1
B11						
Floor 1	-1	-2	2	3	-2	-2
2	3	5	1	1	-3	-3
3	-8	-14	-3	-4	-2	-2
4	3	5	0	0	4	4
5	0	0	4	5	-2	-2
6	2	3	-1	-1	0	0
7	6	10	-1	-1	0	0

Table 10 (continued)
Survey of Animal Facililty Floor on Grid

Survey conducted September 28 and October 4, 2006

	H-3		C-14		P-32	
Location	**cpm/ 100cm^2**	**dpm/ 100cm^2**	**cpm/ 100cm^2**	**dpm/ 100cm^2**	**cpm/ 100cm^2**	**dpm/ 100cm^2**
8	-5	-9	-1	-1	3	3
9	-1	-2	0	0	-1	-1
10	-6	-10	-2	-3	1	1
11	-2	-3	2	3	0	0
12	-5	-9	3	4	4	4
12	-2	-3	0	0	3	3

Notes:
1. cpm is counts per minute, dpm is disintegrations per minute
2. Results for blank have been subtracted from each result
3. dpm = cpm/efficiency, where efficiency is 0.577 for H-3, 0.799 for C-14, and 1.0 for P-32

Table 11
Survey of Floor at Random Locations
Survey performed September 28, 2006

Coordinates (note 4)		H-3 cpm/ 100cm^2	H-3 dpm/ 100cm^2	C-14 cpm/100 cm^2	C-14 dpm/ 100cm^2	P-32 cpm/100 cm^2	P-32 dpm/ 100cm^2
First Floor							
20	**176**	-4	-7	-2	-3	0	0
25	**152**	-2	-3	4	5	-2	-2
4	**154**	1	2	1	1	3	3
14	**135**	9	16	2	3	1	1
15	**129**	-1	-2	-3	-4	-3	-3
9	**122**	0	0	6	8	6	6
27	**100**	1	2	8	10	-4	-4
3	**88**	7	12	6	8	2	2
10	**69**	-2	-3	-3	-4	0	0
9	**123**	1	2	-2	-3	-3	-3
7	**50**	0	0	-7	-9	-1	-1
4	**29**	6	10	0	0	-2	-2
10	**119**	-6	-10	3	4	2	2
30	**86**	-4	-7	4	5	-1	-1
29	**97**	2	3	10	13	-2	-2
23	**138**	-2	-3	8	10	0	0
29	**144**	-2	-3	8	10	-2	-2
0	**134**	0	0	-1	-1	-1	-1
20	**119**	3	5	1	1	-1	-1
6	**18**	-2	-3	4	5	0	0
29	**43**	2	3	-4	-5	-3	-3
14	**95**	-2	-3	-1	-1	-4	-4
20	**128**	5	9	-2	-3	2	2
0	**11**	2	3	-1	-1	-3	-3
20	**36**	-5	-9	3	4	-2	-2
31	**38**	1	2	2	3	-3	-3
26	**22**	-1	-2	-5	-6	-4	-4
Second Floor							
19	**1**	-7	-12	-10	-13	-5	-5
31	**2**	9	16	5	6	-1	-1
21	**3**	0	0	1	1	-2	-2
20	**21**	1	2	1	1	-2	-2
1	**23**	-7	-12	3	4	1	1
8	**31**	-5	-9	4	5	0	0

Table 11 (continued)
Survey of Floor at Random Locations
Survey performed September 28, 2006

Coordinates (note 4)		H-3 cpm/ 100cm^2	H-3 dpm/ 100cm^2	C-14 cpm/100 cm^2	C-14 dpm/ 100cm^2	P-32 cpm/100 cm^2	P-32 dpm/ 100cm^2
17	33	4	7	-5	-6	4	4
7	65	1	2	-2	-3	1	1
6	67	-4	-7	0	0	3	3
11	73	4	7	-3	-4	-1	-1
8	79	7	12	4	5	1	1
5	88	-1	-2	1	1	-1	-1
25	70	-1	2	-2	-3	0	0
1	97	7	12	3	4	-1	-1
9	103	-1	-2	-3	-4	-2	-2
29	103	-2	-3	1	1	5	5
24	102	5	9	-4	-5	-3	-3
2	106	0	0	1	1	-1	-1
13	113	-1	-2	4	5	0	0
14	118	6	10	7	9	-3	-3
24	142	4	7	-5	-6	3	3
4	145	7	12	2	3	4	4
13	148	-2	-3	-2	-3	-1	-1
18	150	5	9	-2	-3	-1	-1
31	160	3	5	2	3	0	0
27	169	1	2	5	6	6	6
26	172	7	12	-1	-1	1	1
Basement							
15	6	5	9	1	1	-3	-3
30	5	2	3	-2	-3	-2	-2
23	10	-3	-5	1	1	-1	-1
28	26	2	3	5	6	1	1
29	31	-4	-7	-1	-1	0	0
32	48	4	7	3	4	0	0
24	55	1	2	2	3	6	6
26	61	2	3	6	8	0	0
17	63	0	0	5	6	1	1
29	83	1	2	-2	-3	-3	-3
21	90	1	2	3	4	-4	-4
20	99	0	0	4	5	1	1
13	101	7	12	3	4	-2	-2
30	104	7	12	2	3	2	2
26	115	1	2	3	4	-2	-2

Table 11 (continued)
Survey of Floor at Random Locations
Survey performed September 28, 2006

Coordinates (note 4)		H-3 cpm/ 100cm^2	H-3 dpm/ 100cm^2	C-14 cpm/100 cm^2	C-14 dpm/ 100cm^2	P-32 cpm/100 cm^2	P-32 dpm/ 100cm^2
7	**149**	-5	-9	0	0	-2	-2
3	**149**	-2	-3	1	1	1	1
31	**155**	4	7	4	5	3	3
2	**157**	-2	-3	-1	-1	-3	-3
30	**160**	4	7	4	5	-1	-1
2	**162**	3	1	10	13	-1	-1
2	**168**	1	2	-4	-5	-1	-1
24	**169**	5	9	3	4	-1	-1
21	**180**	4	7	0	0	2	2
22	**129**	1	2	-3	-4	1	1
30	**100**	-6	-10	3	4	-2	-2
16	**36**	10	17	-1	-1	-2	-2

Notes:
1. cpm is counts per minute, dpm is disintegrations per minute
2. Results for blank have been subtracted from each result
3. dpm = cpm/efficiency, where efficiency is 0.577 for H-3, 0.799 for C-14, and 1.0 for P-32
4. The coordinates are the distance in feet from the exterior corner of the building at room B17 in the basement, 118 on the first floor, and 204 on the second floor.
   It should be noted that although the locations were generated randomly, they were then sorted within each floor so the survey could be done more conveniently.

Table 12
Miscellaneous Sampling - Sinks & hoods and Room 100
Sampling performed September 28 and October 4, 2006

	H-3		C-14		P-32	
Location	**cpm/ 100cm^2**	**dpm/ 100cm^2**	**cpm/ 100cm^2**	**dpm/ 100cm^2**	**cpm/ 100cm^2**	**dpm/ 100cm^2**
Sinks and hoods						
Room 110 sink drain	5	9	-1	-1	2	2
Room 203 sink drain	2	3	4	5	-3	-3
sink drain	-1	-2	2	3	2	2
left hood-left drain	0	0	4	5	5	5
left hood - right drain	-3	-5	-2	-3	2	2
right hood - left drain	-4	-7	1	1	-1	-1
right hood - right drain	1	2	6	8	-2	-2
left hood vent	-3	-5	-3	-4	4	4
right hood vent	0	0	-3	-4	-2	-2
Room 204 sink	2	3	-4	-5	5	5
sink in middle of room	5	9	4	5	-3	-3
hood sink	-5	-9	1	1	-2	-2
hood vent	8	14	3	4	3	3
Room 100						
carpet	-8	-14	1	1	-3	-3
carpet	-6	-10	-1	-1	-3	-3
wall by door	1	2	2	3	-4	-4
side wall	-4	-7	6	8	-7	-7
wall by window	-6	-10	5	6	-5	-5

Notes:
1. cpm is counts per minute, dpm is disintegrations per minute
2. Results for blank have been subtracted from each result
3. dpm = cpm/efficiency, where efficiency is 0.577 for H-3, 0.799 for C-14, and 1.0 for P-32

Note: See Table 9 (April 6, 2006) survey results for swipes of floor drains in Animal Facility

Table 13
Survey of Former Rad Waste Storage Room – B01A
Sampling performed March 9, 2007

	H-3		C-14		P-32	
Location	**cpm/ 100cm^2**	**dpm/ 100cm^2**	**cpm/ 100cm^2**	**dpm/ 100cm^2**	**cpm/ 100cm^2**	**dpm/ 100cm^2**
1. Freezer – interior	0	0	1	1	7	7
2. Freezer – interior	-4	-7	0	0	1	1
3. Freezer – interior	-7	-12	2	3	4	4
4. Freezer – exterior	4	7	-2	-3	2	2
5. Drum 1	3	5	1	1	1	1
6. Drum 2	-1	-2	0	0	4	4
7. Drum 3	-7	-12	13	16	3	3
8. Drum 4	-2	-3	-3	-4	2	2
9. Floor	-2	-3	-4	-5	1	1
10. Floor	0	0	-4	-5	2	2
11. Floor	2	3	4	5	0	0
12. Wall	-2	-3	-6	-8	5	5
13. Wall	3	5	6	8	5	5
14. Wall	-7	-12	1	1	4	4
15. Door	3	5	1	1	-3	-3

Notes:
1. cpm is counts per minute, dpm is disintegrations per minute
2. Results for blank have been subtracted from each result
3. dpm = cpm/efficiency, where efficiency is 0.577 for H-3, 0.799 for C-14, and 1.0 for P-32

Part F

Attachments

Attachment 1

Historical Review of Radioactive Material Use
Coatesville VAMC

1. Introduction

This report is a review of available historical records on the use of radioactive materials at Coatesville VAMC. This report is based primarily on documents obtained from the NRC for the period 1964 to 1979 and documents obtained from Coatesville, primarily for the period 1979 to 1996.

The focus of this report is on the use of C-14 and H-3, which were the only long-lived radionuclides used at Coatesville VAMC.

2. Summary of History

Available records show radioactive materials were being used in Nuclear Medicine Service and the Research Service prior to 1964. The earliest date for which records were available is 1964. License applications to the NRC's predecessor, the Atomic Energy Commission (AEC), from that period refer to previous licenses. In fact, it appears that work was being done under several licenses prior to 1964. In the period 1964 to 1966, all radioactive material work was consolidated into one NRC license, No. 37-10509-01, which was kept until the license was terminated in 1996 (VA, 9/8/64 and 7/20/66). Information about the licenses is summarized in Table 1 of this Attachment.

Nuclear Medicine
Records indicate that Nuclear Medicine was originally in Bldg. 1 and moved to the basement of Bldg. 38 around 1964 (VA, 9/7/66). At some point before 1973, Nuclear Medicine moved to Bldg. 59, where it stayed until the license was terminated in 1996.

Except for 0.5uCi Co-60, only short-lived radionuclides were used in Nuclear Medicine and these are not a decommissioning issue. In 1967, authorization was obtained to use 0.5 uCi of Co-60 for testing for pernicious anemia (VA 9/21/67, NRC 11/14/67). In addition, during the 1970's, it appears that solid waste containing C-14 or H-3 was stored in Bldg. 59. Several documents state that research waste was stored in the Central Disposal Drum in "Bldg. 59 (Dr. Bell)" prior to disposal by a commercial disposal broker (VA 12/2/74). Since Dr. Bell was the Chief of Nuclear Medicine at the time, this implies that the waste was stored in a drum in Nuclear Medicine. Additional surveys in Bldg 59 were not performed in 2006 for the following reasons: a) because Bldg. 59 had been gutted during the interval between 1996 and 2006, b) it was thoroughly evaluated during the 1996 decommissioning process, and c) predominantly only short-lived radioisotopes were used in Nuclear Medicine.

Research

The first mention of research activities is in a 1966 license renewal application to the AEC (VA 7/20/66). It appears that research had been done at Coatesville under a separate license and the 1966 application was to combine research and nuclear medicine under one license. This document states that research would be done with animals using C-14 in Room 100, Bldg. 11. The application and another letter state that the researcher had been using C-14 at the rate of 1 to 3.6 mCi per year for the past several years although it is not clear that the researcher used the material at Coatesville (VA 9/13/66). The application states that there would be some disposal to the sink.

In 1969, authorization to use H-3 was obtained after it was discovered that a researcher used about 1 mCi of H-3 without authorization. This material was injected into rats and the carcasses were incinerated. The documents did not indicate the location of the research or the incinerator NRC (6/23/72).

Starting in 1970, Rooms 203 and 204 in Bldg. 11 are the only rooms identified as areas-of –use for radioactive materials (VA NRC correspondence 12/15/70). In addition, animals (rats and mice) were kept in the basement of Bldg. 11. The 1979 renewal application states that Rooms B-1 to B-11 in the basement were areas of use for radioactive materials (VA NRC correspondence 10/3/79). It stated that the researcher anticipated using about 3 mCi of H-3 and about 1 mCi of C-14. Animal excreta would be discharged to the sewer system but other waste would be disposed of offsite.

A 1988 VA response to an NRC inspection stated that rat carcasses containing C-14 were incinerated (VA 6/13/88). There appeared to be some dispute about whether the specific activity of the carcasses exceeded 10 CFR 20 limits. The location of the incinerator was not identified.

No sealed source inventories, leak tests, or disposal records were available in 2006 and by May 2007. The license dated Oct. 11, 1979 lists two Ni-63 sealed sources in two gas chromatographs. A Coatesville VAMC letter dated 11/28/72 indicated that one of the Ni-63 sources had an activity of 15 mCi, the activity of the other source is unknown but believed to be comparable. Three NRC inspection records were reviewed, dating 6/23/72, 3/30/76, and 8/11/78. The last inspection cited the facility for not having leak tests for the Ni-63 sources. This violation was reported as corrected in a letter from the facility to the NRC dated 8/29/78. Two Monthly Isotope Reports dated 2/11/88 and 2/29/88 listed a Ni-63 source from a gas chromatograph as being placed in a waste drum with another Ni-63 source in Room 1-B in Bldg. 11. It is highly likely that Room 1-B in 1988 is the current Room B01A used as the radioactive waste storage room. A VA document dated 6/7/88 was in response to a NRC inspection and no violations related to sealed source inventory or leak tests were cited. On February 2, 2006 and March 9, 2007, no radioactive materials or sealed sources were found in Room B01A. No additional documentation for these two Ni-63 sealed sources has been located.

Use of radioactive materials in Research Building 11 stopped in 1989 (VA letter 9/28/89). In 1996 a decommissioning survey was conducted in Buildings 59 and 11 (VA letter June

1996). The areas surveyed in Bldg. 11 were Rooms 203, 204, 110, and B01A. Room B01A was used to store radioactive waste. The 1996 decommissioning report stated that Room 110, the surgical suite, was included in the license application but no one remembered radioactive materials ever being used in this room. The decommissioning survey evaluated removable contamination levels by taking wipe samples in the following areas: 52 wipes in Room 204; 43 wipes in Room 203; 20 wipes in Room 110; and 27 wipes in Room B01A. These wipes were analyzed for H-3 and C-14. One wipe with an elevated level was identified: A wipe of a sink in Room 204 measured 305 dpm/100 cm^2 on the liquid scintillation counter's H-3 channel. This contamination level is below the NRC release criteria for H-3. This sink was decontaminated and re-wiped. The re-wipe test results were at or below background. After receiving the 1996 Decommissioning Survey Report for Coatesville VAMC, the NRC terminated the facility's NRC license.

An old Beckman liquid scintillation counter containing a Cs-137 sealed source remained in Room 204 after decommissioning and license termination. Research stopped on the second floor in Building 11 in the mid 1990s, and this floor was effectively closed. Personnel interviews indicated staff were unaware a radioactive sealed source was in the liquid scintillation counter. The activity of the source was unknown until it was removed by the Beckman representative on November 2, 2006. The initial 1982 activity was found to be 40 microcuries..

In January 2006, a total of 26 vials containing 28 sources of C-14, H-3, and decayed I-125 dating from 1975 to 1977 were found in Rooms 201 and 120 in Research Building 11. Immediately following discovery Coatesville VAMC notified Philadelphia VAMC Radiation Safety Office. Philadelphia RSO notified the NHPP. On February 3, 2006, the NHPP Regional Manager conducted a reactive inspection and joined Philadelphia VAMC Radiation Safety Staff while they performed an initial survey of Building 11. The Philadelphia VAMC Radiation Safety staff conducted additional surveys on April 6, September 28, October 4, 2006, and March 9, 2007. A total of 420 additional wipes were taken in Rooms 100, 120, 201, 202, 203, 204, 206, B01A, B1 to B11 in the basement and at random locations throughout the building. These wipes were analyzed for H-3 and C-14. All measured levels were below or slightly above background. No contaminated areas were found.

On April 13, 2006, Radiac Research Corporation, a NRC licensed commercial broker removed the sources and associated materials for disposal. Disposal documentation is included in **Attachment 4.**

On November 2, 2006, a Beckman Coulter, Inc. trained representative removed the estimated 40 microcurie Cesium-137 reference source from the Beckman LS6500 liquid scintillation counter. The removed source was leak tested by Philadelphia VAMC Radiation Safety Staff. The Beckman representative packed the source for shipment. The source was then secured until it was Federal Expressed on November 3, 2007. The source was received by Beckman Coulter, Inc on November 11, 2006l. Leak Test and removal information are included in **Attachments 2 and 3.**

Currently Rooms 203 and 204 are no longer being used. Room 100 is now an office. It was renovated and reduced in size along with the removal of the previously existing sink and workbench. The animal facility in the basement is still being used for non-radioactive materials research.

3. Summary and Conclusion

In Bldg 59, the majority of use in Nuclear Medicine involved short-live radionuclides. It appears a small amount of use and storage of long-lived radionuclides also occurred in the Nuclear Medicine Service prior to 1996. The Nuclear Medicine department was decommissioned in 1996 and Bldg. 59 was subsequently gutted. This removal of walls and plumbing in Bldg 59 prevented additional surveys of areas in existence at the time of use of long lived radionuclides.

In Bldg. 11, the long-lived radionuclides, H-3 and C-14, were used in Rooms 100, 203, and 204 during the period 1964 to 1989. Animals injected with radioactive materials were housed in Rooms B-1 through B-11. Radioactive waste was stored in Room B01A. Room 110 was identified as being used for radioactive materials on a license application but may not have been used for this purpose.

Radioactive waste was incinerated but there is no indication where that was performed. It appears that all incineration was performed in accordance with NRC regulations. In any case, the amount incinerated would have been a few millicuries per year at most.

Radioactive liquid was discharged via sinks to the sewer system. The 1996 decommissioning survey found a small amount of H-3 contamination in a sink in Room 204. One would expect that low levels of radioactive contamination are present in the drain pipes in Bldg. 11. The last discharge would have been in 1989 and the maximum estimated activity discharged would have been a few millicuries per year.

Radioactive vials were found in Rooms 120 and 201 in January, 2006. As a result, extensive radiation surveys were subsequently conducted in Bldg 11. These surveys were designed to measure radiation exposures and removable contamination. The measured activity for all areas wipe-tested in 2006 and 2007 were below all release criteria used and most were below background level. In addition, all area surveys were performed with a Geiger-counter with a pancake probe. All area radiation exposures were at background level.

There is no evidence of any release to soils or groundwater and it is considered unlikely that a release occurred.

Two Ni-63 sealed sources with an estimated activity of 15 mCi were used in two gas chromatographs in Bldg. 11. There is no record of leak tests or disposal. However, Bldg. 11 has been thoroughly searched and the gas chromatographs are no longer present.

On November 2, 2006, an estimated 40 microcurie Cesium-137 sealed source used in the Beckman liquid scintillation counter was removed by a Beckman Coulter, Inc. representative. A leak test by the PVAMC Health Physicist was performed prior to the source being packed for shipment to Beckman Coulter, Inc. The source was Federal Expressed to Beckman Coulter, Inc on November 3, 2007 and received by them on November 11, 2007.

4. Bibliography

VA letters to the AEC and NRC (Available at NHPP and Philadelphia VAMC Radiation Safety Office):

1. September 8, 1964
2. July 20, 1966
3. September 7, 1966
4. September 13, 1966
5. December 15, 1970
6. December 2, 1974
7. October. 3, 1979
8. June 13, 1988
9. September 28, 1989

VA Decommissioning Report, June 1996

NRC License for Coatesville, November 14, 1967

NRC Coatesville Inspection Report, June 23, 1972

Interviews with lab tech who worked in Bldg. 11 from 1969 to present

Note: All the documents dated prior to 1988 were obtained from the NRC. Other documents were obtained from Coatesville VAMC. All documents are available from the VA National Health Physics Program office.

Table 1

History of Coatesville NRC Licenses*

Date	Nuclear Medicine	Research
Pre-1964 From 9/8/64 application	31-523-1 31-523-6 E 65 31-423-6 E 60 15-8114-1 E 66	
11/30/64	37-10509-1	
Pre-1966 From 7/20/66 application		196
9/22/66	37-10509-01 combined license continued under this number until license was terminated in 1996	

NHPP Permit

February 21, 2006	Permit # 37-10509-01

Attachment 2

Leak Test Results
Coatesville VAMC
Cesium -137 Sealed Source

Date: November 2, 2006

Sample #	Sample	Channel 1
1	Blank	580 cpm
2	Cs-137	499 cpm
Net cpm		- 81
Net dpm		- 540

The above is less than 0.005 microcuries.

Analysis equipment - Berthold Gamma Counter LB211
Philadelphia VAMC Nuclear Medicine Service

Counting Efficiency = 15%

Net cpm = Cs-137 cpm – Average Background cpm

dpm = cpm / % Efficiency

Performed by Richard Shimko
Richard Shimko, CHP

Reviewed By Mary E. Moore
Mary E. Moore, DABR, DABMP
Radiation Safety Officer

Note: Leak test performed by Beckman on 11/11/06 is referenced in their Returned Goods Authorization Form contained in Attachment 3

Attachment 3

1) Service Report from Beckman Coulter, Inc

2) Transfer Returned Goods Authorization Form
For
Cesium-137 Sealed Source
Part # 598860

3) U.S. NRC License for Beckman Coulter, Inc

BECKMAN COULTER

Customer Technical Support

"Service...the way service should be"

www.beckmancoulter.com
Phone 1-800-742-2345

ACCOUNT	MODEL	SERIAL NUMBER
U S VETERANS ADMINISTRATION BLACKHORSE HILL RD BIO 1400 BLACKHORSE HILL RD COATESVILLE PA 19320 (215) 823-4295	LS9800 ID NUMBER 494283 MODEL DESCRIPTION LIQUID SCINTILLATION COUNTER 9 AGREEMENT TYPE PURCHASE ORDER NUMBER	7300040 PROPERTY NUMBER AGREEMENT NUMBER

SERVICE ORDER NUMBER	REQUEST DATE	CALL COMPLETE DATE
5708666	10/10/2006	11/02/2006

DESCRIPTION OF WORK PERFORMED

PROBLEM: Credit card on file**, Source removal/see notes** PO# P70336

SOLUTION: removed cesium source for instrument. Instrument ok to scrap. source returned on RGA AN92482 ***

END DATE	DESCRIPTION	TYPE	HOURS	RATE	EXTENDED AMOUNT	CUSTOMER CHARGE
11/02/2006	REPAIR	Travel	3.00	$275.00	$825.00	$825.00
		Labor	1.00	$275.00	$275.00	$275.00
				LABOR/TRAVEL TOTAL	$1,100.00	$1,100.00

PART NUMBER	PART DESCRIPTION	QTY	PRICE	EXTENDED AMOUNT	CUSTOMER CHARGE
599764	SHIPPING KIT, 137CS SOURCE	1.00	$500.00	$500.00	$500.00
			PARTS TOTAL	$500.00	$500.00
			TOTAL CHARGE	$1,600.00	$1,600.00

STEVEN MILLER
TECHNICAL SPECIALIST

11/02/2006
BECKMAN COULTER, INC. DATE

Rich Schimko
lab

11/02/2006
U S VETERANS ADMINISTRATION DATE

Total is an estimate only and does not include applicable sales tax and shipping charges.

Returned Goods Authorization

From: U S VETERANS ADMINISTRATION
1400 BLACKHORSE HILL RD
COATESVILLE, PA 19320
Attn:RICH SCHIMKO

To: Beckman Coulter, Inc

Attn: Returned Goods RGA # AN92482
Francisco Martinez/BII

This authorization expires 11/19/2006

Reference Information (Original Shipment)
Purchase Order No. N/A
Purchase Order Date 10/19/2006
Sales Order No N/A

Purchase Order No.
Sales Order Number

Item	Part Number	Description	Quantity	Serial No.
1	596800	**HM** SOURCE (RGA ROD) SHIP W/ 599764	1	7300040
2				
3				
4				
5				
6				

NOTES: Source Removal - MODEL: LS9800 S/N: 7300040

Your RGA Processor is: Brandon K Corbin

RGA INFORMATION

Originator:	Brandon K Corbin	Date:	10/19/2006
Responsible Person:	Brandon K Corbin		
Territory:	S815	Status:	Closed 11/14/2006
CSR Supervisor Name:	Karen A Baker/Bil	Product Category:	Other
RGA Processor:	Brandon K Corbin	Instrument Category:	Radioactive Source
Receiving Processor:	Francisco Martinez/Bil	Tracking Codes:	S3-Radioactive Source/Field Service
Ready For Pickup Date:		Vendor Pickup?	No
Location where Product to be Returned:	Beckman Coulter, Inc		

CUSTOMER INFORMATION

Customer Name (Code)	U S VETERANS ADMINISTRATION	DCYB000
Ship To Address	1400 BLACKHORSE HILL RD COATESVILLE, PA 19320	
Attention Line	RICH SCHIMKO	
Telephone	215-823-4295	
FAX		

PRODUCT INFORMATION

Purchase Order No.:	N/A	Shipper Document No:	N/A		
Purchase Order Date:	10/19/2006	Credit Memo No.:	918209SD00Z	PCC Code	STD

Part No.	Description	Serial No	Qty	Qty Ret'd	Disposition
588660	**HM** SOURCE (RGA RQD) SHIP W/ 599764	7300040	1	1	Scrap

NOTES

Received Date: 11/11/2006 Date last changed: 11/14/2006

Received By: Francisco Martinez/Bil Changed by: Brandon K Corbin

RGA PROCESSOR NOTES

10/19/2006 01:41 PM Brandon K Corbin -- EMAILED RGA TO FSE: STEVE MILLER

RECEIVING NOTES

11/11/2006 07:53 AM Francisco Martinez -- SWAB TEST PENDING
11/11/2006 12:04 PM Francisco Martinez -- SWAB TEST IS A PASS

CUSTOMER NOTES

Source Removal - MODEL: LS9800 S/N: 7300040

CONTRACT ADMIN NOTES

VENDOR NOTES

CUSTOMER ADVOCATE NOTES

NRC FORM 374

U.S. NUCLEAR REGULATORY COMMISSION

Amendment No. 08

MATERIALS LICENSE

Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974 (Public Law 93-438), and Title 10, Code of Federal Regulations, Chapter I, Parts 30, 31, 32, 33, 34, 35, 36, 39, 40, and 70, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess, and transfer byproduct, source, and special nuclear material designated below; to use such material for the purpose(s) and at the place(s) designated below; to deliver or transfer such material to persons authorized to receive it in accordance with the regulations of the applicable Part(s). This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, as amended, and is subject to all applicable rules, regulations, and orders of the Nuclear Regulatory Commission now or hereafter in effect and to any conditions specified below.

Licensee	
1. BECKMAN COULTER INC.	In accordance with application dated December 18, 2001, 3. License number 04-02624-03E is renewed in its entirety to read as follows:
2. 4300 Harbor Blvd. P.O. Box 3100 Fullerton, California 92835	4. Expiration date May 31, 2012 5. Docket No. 030-09356 Reference No.

6. Byproduct, source, and/or special nuclear material	7. Chemical and/or physical form	8. Maximum amount that licensee may possess at any one time under this license
A. Iodine-125 B. Hydrogen-3 C. Carbon-14 D. Cesium-137	A. - D. Sealed liquid and solid calibration standards	A. - D. Not applicable (See Condition 10)

9. Authorized use:

Pursuant to Section 32.18, 10 CFR Part 32, "Specific Domestic Licenses to Manufacture or Transfer Certain Items Containing Byproduct Material," the licensee is authorized to distribute iodine-125, hydrogen-3, carbon-14, and cesium-137, sealed liquid and solid calibration standards to persons exempt from licensing pursuant to Section 30.18, 10 CFR Part 30, or equivalent provisions of the regulations of any Agreement State.

CONDITIONS

10. This license does not authorize possession or use of licensed material.

11. The licensee is authorized to distribute only from its facility located at 4300 Harbor Blvd., Fullerton, CA.

12. The licensee shall submit periodic material transfer reports as specified in Section 32.20, 10 CFR Part 32.

NRC FORM 374A	U.S. NUCLEAR REGULATORY COMMISSION	PAGE 2 OF 2 PAGES
MATERIALS LICENSE **SUPPLEMENTARY SHEET**		License Number 04-02624-03E
		Docket or Reference Number 030-09356
		Amendment No. 08

CONDITIONS

(Continued)

13. Except as specifically provided otherwise by this license, the licensee shall conduct its program in accordance with the statements, representations, and procedures contained in the documents, including any enclosures, listed below. The U.S. Nuclear Regulatory Commission's regulations shall govern unless the statements, representations, and procedures in the licensee's application and correspondence are more restrictive than the regulations.

    A. Application dated December 18, 2001; and
    B. Letter dated March 18, 2002.

FOR THE U.S. NUCLEAR REGULATORY COMMISSION

Date May 1, 2002

By Anthony S. Kirkwood

Anthony S. Kirkwood
Nuclear Materials Safety and Inspection Branch
Division of Industrial and Medical Nuclear Safety
Office of Nuclear Materials Safety and Safeguards
Washington, D.C. 20555

Attachment 4

Manifests for Removal and Disposal of 28 Sources

From

Radiac Research Corporation

And

Duratek

Attachment 5

VA National Health Physics Program Closeout Survey Questionnaire

VA medical center\Permit number: 37-01509-01

Building/room location: Building 11, Coatesville VAMC

1. List radionuclides used in the room; circle form used (Sealed, Unsealed, or Gas):

Radionuclides Used	Form Used	First Use Date	Last Use Date
H-3	Unsealed	Unknown	1989
C-14	Unsealed	Unknown	1989
I-125	Unsealed	Unknown	1989
	S U G		
	S U G		
	S U G		
	S U G		
	S U G		
	S U G		
	S U G		

2. Did a major spill occur in the room which resulted in residual radioactivity?

[X] No [ ] Yes (if yes, attach description)

3. Did any sealed sources stored or used in the room leak or fail a leak test?

[X] No [ ] Yes (if yes, attach description)

4. Were sealed sources which require a leak test transferred or relocated from the room?

[X] No [ ] Yes (if yes, attach regulatory current test results)

5. Were all radioactive materials, sources, and equipment removed?

[ ] No [X] Yes (if yes, attach description)

6. Did the closeout survey methods follow best practices in NHPP FAQ 02-03?

[ ] No [X] Yes (if no, attach alternate methods) (See Report for complete description)

7. What survey instruments were used?

Exposure rate measurements

Survey meter/probe manufacturer/model: Ludlum Model 44-9 pancake G-M probe

Calibration date: 11/1/05 Background reading in mR per hour: 0.03

Surface scans for fixed radioactivity

Survey meter/probe manufacturer/model: Ludlum Model 44-9 pancake G-M probe

Calibration date: 11/1/05 Background reading in CPM or DPM: see note

Swipe surveys for removable radioactive contamination

Counting equipment manufacturer/model: Beckman Model LS 6500

Background counts: see Table 2 in Report Calibration source counts: 49537 cpm for H-3, 34723 cpm for C-14

Calibration source efficiencies: 0.577 for H-3, 0.799 for C-14

Minimum detectable activities (uCi or DPM): see Table 2 in Report

8. Were any results for exposure rate measurements or surface scans for fixed radioactivity greater than background readings?

[X] No [ ] Yes (if yes, attach description)

9. Were any swipe survey results greater than applicable release criteria in NUREG 1556, Volume 11, Table S.5?

[X] No [ ] Yes (if yes, attach description)

10. Information attached (other than listed above).

[X] Room diagram [ ] Survey grid [ ] Counting system calibration/quality assurance results

[X] Other (specify): Survey Report

Point of contact Name: Mary E. Moore

Telephone number/e-mail address: 215-823-6009, MaryE.Moore@med.va.gov

Note: Survey meter calibrated for mR/hr, not cpm

Department of Veterans Affairs
Central Arkansas Veterans Healthcare System
4300 West 7th Street
Little Rock, Arkansas 72205-5484

OFFICIAL BUSINESS

115HP/NLR

NEOPOST **$2.84**
JUN 28 2007
US POSTAGE
FIRST CLASS
MAILED FROM 72114
048J0085001513

Nuclear Regulatory Commission
Attn: Cassandra Frazier
2443 Warrenville Rd #210
Lisle, IL 60532-4352