

MATERIALS LICENSE

Amendment No. 07

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.

398655

Licensee

1. University of Detroit Mercy

2. P.O. Box 19900
Detroit, MI 48219-0900In accordance with application dated
May 26, 19953. License Number 21-00241-09 is renewed in
its entirety to read as follows:

4. Expiration Date March 31, 2007

5. Docket or
Reference No. 030-142886. Byproduct, Source, and/or
Special Nuclear Material7. Chemical and/or Physical
Form8. Maximum Amount that Licensee
May Possess at Any One Time
Under This License

A. Iodine-125
B. Phosphorus-32
C. Carbon-14
D. Hydrogen-3
E. Calcium-45
F. Sulfur-35
G. Rubidium-86
H. Plutonium-239

A. Any
B. Any
C. Any
D. Any
E. Any
F. Any
G. Any
H. Encapsulated as Pu-
Be neutron source
(NUMEC)

A. 500 microcuries
B. 500 microcuries
C. 2 millicuries
D. 5 millicuries
E. 1 millicurie
F. 1 millicurie
G. 1 millicurie
H. 32 grams

9. Authorized Use:

- A. through G. Laboratory research including animal studies. Teaching of students.
O. For storage only in a "Visifluex I" neutron howitzer incident to disposal.

CONDITIONS

10. Licensed material shall be used only at the McNichols Campus, 4001 West McNichols Road, Detroit, Michigan and 8200 Outer Drive, Detroit, Michigan.

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**MATERIALS LICENSE
SUPPLEMENTARY SHEET**

License Number

21-00241-09

Docket or Reference Number

030-14288

Amendment No. 07

11. Licensed material listed in Item 6. above is authorized for use by, or under the supervision of, the following individual(s) for the materials and use indicated:
- A. Mary Low Caspers, Ph.D. Iodine-125, phosphorus-32, carbon-14, hydrogen-3, calcium-45, sulfur-35 and rubidium-86
 - B. Michael Gleason, Ph.D. Iodine-125, phosphorus-32, carbon-14, hydrogen-3, calcium-45, sulfur-35 and rubidium-86
 - C. Nancy J. Bow, Ph.D. Plutonium-239 as Pu-Be source and carbon-14
 - D. R. W. Rowland, D.M.D. Hydrogen-3 and iodine-125
12. The Radiation Safety Officer for this license is Michael Gleason, Ph.D.
13. A. Sealed sources shall be tested for leakage and/or contamination at intervals not to exceed 6 months or at such other intervals as specified by the certificate of registration referred to in 10 CFR 32.210.
- B. Notwithstanding Paragraph A of this Condition, sealed sources designed to emit alpha particles shall be tested for leakage and/or contamination at intervals not to exceed 3 months.
- C. In the absence of a certificate from a transferor indicating that a leak test has been made within 6 months prior to the transfer, a sealed source or detector cell received from another person shall not be put into use until tested.
- D. Sealed sources need not be leak tested if:
- (i) they contain only hydrogen-3; or
 - (ii) they contain only a radioactive gas; or
 - (iii) the half-life of the isotope is 30 days or less; or
 - (iv) they contain not more than 100 microcuries of beta and/or gamma emitting material or not more than 10 microcuries of alpha emitting material; or
 - (v) they are not designed to emit alpha particles, are in storage, and are not being used. However, when they are removed from storage for use or transferred to another person, and have not been tested within the required leak test interval, they shall be tested before use or transfer. No sealed source or detector cell shall be stored for a period of more than 10 years without being tested for leakage and/or contamination.

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- E. The leak test shall be capable of detecting the presence of 0.005 microcurie of radioactive material on the test sample. If the test reveals the presence of 0.005 microcurie or more of removable contamination, a report shall be filed with the U.S. Nuclear Regulatory Commission in accordance with 10 CFR 30.50(b)(2), and the source shall be removed immediately from service and decontaminated, repaired, or disposed of in accordance with Commission regulations. The report shall be filed within 5 days of the date the leak test result is known with the U.S. Nuclear Regulatory Commission, Region III, ATTN: Chief, Nuclear Materials Safety Branch, 801 Warrenville Road, Lisle, Illinois 60532-4351. The report shall specify the source involved, the test results, and corrective action taken.
- F. Tests for leakage and/or contamination shall be performed by the licensee or by other persons specifically licensed by the Commission or an Agreement State to Perform such services.
14. Sealed sources containing licensed material shall not be opened.
15. The licensee shall not use licensed material in or on human beings.
16. Experimental animals administered licensed materials or their products shall not be used for human consumption.
17. No plutonium, regardless of form, shall be delivered to a carrier for shipment by air transport or transported in an aircraft by the licensee except in packages the design of which the NRC has specifically approved for transport of plutonium by air.
18. The licensee is authorized to hold radioactive material with a physical half-life of less than 65 days for decay-in-storage before disposal in ordinary trash provided:
- A. Radioactive waste to be disposed of in this manner shall be held for decay a minimum of 10 half-lives.
- B. Before disposal as ordinary trash, byproduct material shall be surveyed at the container surface with the appropriate survey meter set on its most sensitive scale and with no interposed shielding to determine that its radioactivity cannot be distinguished from background. All radiation labels shall be removed or obliterated.
- C. A record of each disposal permitted under this License Condition shall be retained for three years. The record must include the date of disposal, the date on which the byproduct material was placed in storage, the radionuclides disposed, the survey instrument used, the background dose rate, the dose rate measured at the surface of each waste container, and the name of the individual who performed the disposal.

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19. Except as specifically provided otherwise in this license, the licensee shall conduct its program in accordance with the statements, representations, and procedures contained in the documents, including any enclosures, listed below. The 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 May 26, 1995; and
- B. Letters dated July 31, 1996, and December 4, 1996.

FOR THE U.S. NUCLEAR REGULATORY COMMISSION

Date 2/26/97

By James Mullaw
Nuclear Materials Licensing Branch, Region III

COPY

BETWEEN:

LICENSE FEE MANAGEMENT BRANCH, ARM
AND
REGIONAL LICENSING SECTIONS

(FOR LFMS USE)
INFORMATION FROM LTS

PROGRAM CODE: 03620
STATUS CODE: 2
FEE CATEGORY: EX 3L 1C
EXP. DATE: 19950630
FEE COMMENTS: 170.11(A)(4)
DECOM FIN ASSUR REQD: N

LICENSE FEE TRANSMITTAL

A. REGION

1. APPLICATION ATTACHED
APPLICANT/LICENSEE: DETROIT, UNIVERSITY OF
RECEIVED DATE: 950601
DOCKET NO: 3014288
CONTROL NO.: 398655
LICENSE NO.: 21-00241-09
ACTION TYPE: RENEWAL

2. FEE ATTACHED
AMOUNT: \$
CHECK NO.: \$

3. COMMENTS

SIGNED
DATE

Deane Bell
6-2-95

B. LICENSE FEE MANAGEMENT BRANCH (CHECK WHEN ALL IS DONE) ☒

1. FEE CATEGORY AND AMOUNT: EX 3L 1C **FEE EXEMPT**
170.11(A)(4)

2. CORRECT FEE PAID. APPLICATION MAY BE PROCESSED FOR:
AMENDMENT
RENEWAL ☒
LICENSE

3. OTHER

SIGNED
DATE

SC 6/6/95

RECEIVED BY LFDCB

Date June 5, 1995

Log June 5 TTT

By SC

Date Completed 6/6/95

Storage only

170.11(A)(4)

(10-94)
10 CFR 30.32, 33
34, 35, 36, 39 and 40

APPLICATION FOR MATERIAL LICENSE

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST 3 HOURS. SUBMITTAL OF THE APPLICATION IS NECESSARY TO DETERMINE THAT THE APPLICANT IS QUALIFIED AND THAT ADEQUATE PROCEDURES EXIST TO PROTECT THE PUBLIC HEALTH AND SAFETY. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (T-6 F33) U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001 AND TO THE PAPERWORK REDUCTION PROJECT (3150-0120) OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

INSTRUCTIONS: SEE THE APPROPRIATE LICENSE APPLICATION GUIDE FOR DETAILED INSTRUCTIONS FOR COMPLETING APPLICATION. SEND TWO COPIES OF THE ENTIRE COMPLETED APPLICATION TO THE NRC OFFICE SPECIFIED BELOW.

APPLICATION FOR DISTRIBUTION OF EXEMPT PRODUCTS FILE APPLICATIONS WITH

DIVISION OF INDUSTRIAL AND MEDICAL NUCLEAR SAFETY
OFFICE OF NUCLEAR MATERIALS SAFETY AND SAFEGUARDS
U.S. NUCLEAR REGULATORY COMMISSION
WASHINGTON, DC 20555-0001

ALL OTHER PERSONS FILE APPLICATIONS AS FOLLOWS:

IF YOU ARE LOCATED IN:

CONNECTICUT, DELAWARE, DISTRICT OF COLUMBIA, MAINE, MARYLAND,
MASSACHUSETTS, NEW HAMPSHIRE, NEW JERSEY, NEW YORK, PENNSYLVANIA,
RHODE ISLAND, OR VERMONT, SEND APPLICATIONS TO:

LICENSING ASSISTANT SECTION
NUCLEAR MATERIALS SAFETY BRANCH
U.S. NUCLEAR REGULATORY COMMISSION, REGION I
475 ALLENDALE ROAD
KING OF PRUSSIA, PA 19406-1415

ALABAMA, FLORIDA, GEORGIA, KENTUCKY, MISSISSIPPI, NORTH CAROLINA, PUERTO
RICO, SOUTH CAROLINA, TENNESSEE, VIRGINIA, VIRGIN ISLANDS, OR WEST VIRGINIA,
SEND APPLICATIONS TO:

NUCLEAR MATERIALS LICENSING SECTION
U.S. NUCLEAR REGULATORY COMMISSION, REGION II
101 MARIETTA STREET, NW, SUITE 2000
ATLANTA, GA 30323-0199

IF YOU ARE LOCATED IN:

ILLINOIS, INDIANA, IOWA, MICHIGAN, MINNESOTA, MISSOURI, OHIO, OR WISCONSIN,
SEND APPLICATIONS TO:

MATERIALS LICENSING SECTION
U.S. NUCLEAR REGULATORY COMMISSION, REGION III
501 WARRENVILLE RD
LISLE, IL 60532-4351

ALASKA, ARIZONA, ARKANSAS, CALIFORNIA, COLORADO, HAWAII, IDAHO, KANSAS,
LOUISIANA, MONTANA, NEBRASKA, NEVADA, NEW MEXICO, NORTH DAKOTA,
OKLAHOMA, OREGON, PACIFIC TRUST TERRITORIES, SOUTH DAKOTA, TEXAS, UTAH,
WASHINGTON, OR WYOMING, SEND APPLICATIONS TO:

NUCLEAR MATERIALS LICENSING SECTION
U.S. NUCLEAR REGULATORY COMMISSION, REGION IV
511 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TX 76011-8054

PERSONS LOCATED IN AGREEMENT STATES SEND APPLICATIONS TO THE U.S. NUCLEAR REGULATORY COMMISSION ONLY IF THEY WISH TO POSSESS AND USE LICENSED MATERIAL IN STATES SUBJECT TO U.S. NUCLEAR REGULATORY COMMISSION JURISDICTIONS.

1. THIS IS AN APPLICATION FOR (Check appropriate item)

- ☐ A. NEW LICENSE
☐ B. AMENDMENT TO LICENSE NUMBER _____
☒ C. RENEWAL OF LICENSE NUMBER 21-00-241-09

2. NAME AND MAILING ADDRESS OF APPLICANT (Include Zip code)

University of Detroit Mercy
P.O. Box 19900
Detroit, MI 48219-0900

3. ADDRESS(ES) WHERE LICENSED MATERIAL WILL BE USED OR POSSESSED

4001 West McNichols Rd., Detroit, MI 48221
8200 Outer Drive, Detroit, MI 48235

4. NAME OF PERSON TO BE CONTACTED ABOUT THIS APPLICATION

Mr. Bradley Fitch, Chair
Radiation Safety Committee

TELEPHONE NUMBER
(313) 993-1587

SUBMIT ITEMS 5 THROUGH 11 ON 5-1/2 X 11" PAPER. THE TYPE AND SCOPE OF INFORMATION TO BE PROVIDED IS DESCRIBED IN THE LICENSE APPLICATION GUIDE.

5. RADIOACTIVE MATERIAL

a. Element and mass number b. chemical and/or physical form, and c. maximum amount
which will be possessed at any one time

6. PURPOSE(S) FOR WHICH LICENSED MATERIAL WILL BE USED

7. INDIVIDUAL(S) RESPONSIBLE FOR RADIATION SAFETY PROGRAM AND THEIR TRAINING EXPERIENCE

8. TRAINING FOR INDIVIDUALS WORKING IN OR FREQUENTING RESTRICTED AREAS

9. FACILITIES AND EQUIPMENT

10. RADIATION SAFETY PROGRAM

11. WASTE MANAGEMENT

12. LICENSEE FEES (See 10 CFR 170 and Section 170.31)

FEE CATEGORY Fee Exempt

AMOUNT
ENCLOSED \$ N/A

13. CERTIFICATION (Must be completed by applicant) THE APPLICANT UNDERSTANDS THAT ALL STATEMENTS AND REPRESENTATIONS MADE IN THIS APPLICATION ARE BINDING UPON THE APPLICANT.

THE APPLICANT AND ANY OFFICIAL EXECUTING THIS CERTIFICATION ON BEHALF OF THE APPLICANT, NAMED IN ITEM 2, CERTIFY THAT THIS APPLICATION IS PREPARED IN CONFORMITY WITH TITLE 10 CODE OF FEDERAL REGULATIONS, PARTS 30, 32, 33, 34, 35, 36, 39 AND 40 AND THAT ALL INFORMATION CONTAINED HEREIN IS TRUE AND CORRECT TO THE BEST OF THEIR KNOWLEDGE AND BELIEF.

WARNING: 18 U.S.C. SECTION 1001 ACT OF JUNE 25, 1948 82 STAT. 749 MAKES IT A CRIMINAL OFFENSE TO MAKE A WILLFULLY FALSE STATEMENT OR REPRESENTATION TO ANY DEPARTMENT OR AGENCY OF THE UNITED STATES AS TO ANY MATTER WITHIN ITS JURISDICTION.

CERTIFYING OFFICER - Typed/Printed Name and Title

Maureen A. Fay, O.P., Ph.D. - President

SIGNATURE

Maureen A. Fay

DATE

5-26-95

FOR NRC USE ONLY

TYPE OF FEE	FEE LOG	FEE CATEGORY	AMOUNT RECEIVED	CHECK NUMBER	COMMENTS
			\$		
APPROVED BY				DATE	

398655

RECEIVED

JUN 1 - 1995

REGION III



May 26, 1995

Office of the President

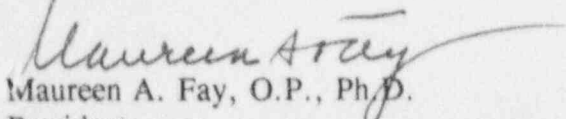
Materials Licensing Section
U.S. Nuclear Regulatory Commission, Region III
801 Warrenville Rd.
Lisle, IL 60532-4351

Gentlemen:

Attached is our renewal application, drafted to reflect our current program. Although several changes cannot be effected until approval of the renewal application, the major changes in the application are the following:

1. Activities utilizing by-product material now being conducted at the Dental Campus will be conducted at the Outer Drive Campus.
2. The plutonium-beryllium neutron source is scheduled for transfer to Los Alamos National Laboratory under their program for the recovery of neutron sources possessed by learning institutions and government agencies. Because of the current downsizing of government agencies at a rapid pace, and since these agencies take priority, the transfer of this neutron source will be delayed until at least March of 1997. We have been advised by Materials Licensing that since the NRC reinstated the annual fee exemption for nonprofit educational institutions, it is appropriate and will require less paperwork to include this source as a stored source under our existing license, rather than to request a separate storage license.
3. Dr. Leo Blackwell, the current Radiation Safety Officer, will continue his association with the University of Detroit Mercy, but will no longer be involved in radiation safety or the use of radioactive materials. He will, however, be available to the new Radiation Safety Officer, the Radiation Safety Committee and its Chair for consultation.

Sincerely,


Maureen A. Fay, O.P., Ph.D.
President

Enclosures

cc: Mr. Bradley N. Fitch, Chair, University Radiation Safety Committee
Dr. Michael Gleason, University Radiation Safety Officer

JUN 1 1995

4001 W. McNichols Road
PO Box 19900
Detroit, Michigan 48219-0900
313-993-1455

University of Detroit Mercy

APPLICATION FOR MATERIAL LICENSE
NRC FORM 313 (10-94)

5. Radioactive Material

<u>Element and Mass #</u>	<u>Chemical Form</u>	<u>Maximum Amount</u>
A. Iodine-125	A. Any	A. 2mCi
B. Phosphorus-32	B. Any	B. 5mCi
C. Carbon-14	C. Any	C. 15mCi
D. Hydrogen-3	D. Any	D. 25mCi
E. Calcium-45	E. Any	E. 5mCi
F. Sulfur-35	F. Any	F. 5mCi
G. Rubidium-86	G. Any	G. 5mCi
H. Plutonium-239	H. Encapsulated as Pu-Be neutron Source (NUMEC) <u>STORAGE ONLY</u>	H. 32 grams

6. Purpose(s) For Which Licensed Material Will Be Used

A - G In vitro studies and in vivo studies in laboratory animals for the training of undergraduate and graduate students.

H - Storage Only.

7. Individual(s) Responsible For Radiation Safety Program and Their Training and Experience

Michael Gleason, Ph.D., D.D.S.

Formal courses in Radiation Biology, Radiation Chemistry, and Radiation Physics as an undergraduate student at University of Dayton and a graduate student at Kent State University, further training as a post-doctoral fellow at Case Western Reserve University.

M. Gleason, Ph.D., D.D.S. - Experience in the Use of Radioactive Material:

ISOTOPE	MAXIMUM ACTIVITY	DURATION OF EXPERIENCE	TYPE OF USE
Hydrogen-3	5 mCi	20 Years	in vitro/in vivo
Carbon-14	1 mCi	20 Years	in vitro/in vivo
Phosphorus-32	1 mCi	10 Years	in vitro
Iodine-125	2 mCi	5 Years	in vitro

8. Training For Individuals Working In Or Frequenting Restricted Areas

Licensed material listed in item 5 above is to be used by or under the supervision of the following individuals. Training and experience is noted following the named individual.

Nancy Bow, M.S.

Formal courses in Nuclear Physics at the University of Detroit as an undergraduate and graduate student, as well as on the job training supervising the radiation laboratory.

N. Bow, M.S. - Experience in the Use of Radioactive Material:

ISOTOPE	MAXIMUM ACTIVITY	DURATION OF EXPERIENCE	TYPE OF USE
Pu-Be Neutron Source	2 Ci	30 Years	Teaching
Carbon-14	50 μ Ci	30 Years	Teaching
Cobalt-60	10 μ Ci	30 Years	Teaching
Cesium-137	10 μ Ci	30 Years	Teaching
Americium-241	0.12 μ Ci	15 Years	Teaching
Thallium-204	50 μ Ci	30 Years	Teaching

Mary Lou Caspers, Ph.D.

Formal courses in Radiation Biology, Radiation Chemistry, and Radiation Physics as an undergraduate and graduate student at the University of Detroit, Wayne State University, and National Institutes of Health.

M. L. Caspers, Ph.D. - Experience in the Use of Radioactive Materials:

ISOTOPE	MAXIMUM ACTIVITY	DURATION OF EXPERIENCE	TYPE OF USE
Hydrogen-3	5 mCi	20 Years	in vitro
Carbon-14	1 mCi	20 Years	in vitro
Phosphorus-32	1 mCi	20 Years	in vitro
Iodine-125	2 mCi	20 Years	in vitro
Lead-210	< 1 mCi	5 Years	in vitro

Michael Gleason, Ph.D., D.D.S.

(See Radiation Safety Officer above.)

Randal W. Rowland, M.S., D.M.D., M.S.D.

Formal courses in Radiation Physics and Radiation Biology, including Radiation Protection, Measurement, Calculation and Effects of Radiation at Medical College of Virginia, University of Alabama-Birmingham and the University of Kentucky.

R. W. Rowland, M.S., D.M.D., M.S.D. - Experience in the Use of Radioactive Materials:

ISOTOPE	MAXIMUM AMOUNT	DURATION OF EXPERIENCE	TYPE OF USE
Hydrogen-3	5 mCi	2 years	in vitro
Iodine-125	2 mCi	3 Years	in vitro

9. Facilities And Equipment

FACILITIES

By-product materials will be used or stored in two buildings on the McNichols Campus, located at 4001 W. McNichols Road, Detroit MI, 48221; and in one building on the Outer Drive Campus, located at 8200 Outer Drive, Detroit, MI 48235.

These facilities are described as follows:

The McNichols Campus

By-product materials will be used in Rooms 201B and 201A of the Life Sciences Building. Room 201B, which has a hood, is designated as a storage and preparation area; and 201A, an area where tracer amounts will be used. By-product materials will be used in Room 205 of the Chemistry Building. Storage and preparation of tracer amounts will be carried out in the hood available in Room 205.

The Outer Drive Campus

By-product materials will be used in Rooms 105A, 105 and 203 of the Science Center. Room 105A is designated as a storage area; Rooms 105 (which has a hood) and 203, as preparation areas.

EQUIPMENT

Radiation Detection Instruments

<u>MODEL NUMBER</u>	<u>RADIATION DETECTED</u>	<u>SENSITIVITY (mR/hr)</u>	<u>USE</u>
Victoreen - Model 450	gamma above 7 keV beta above 100 keV alpha above 4 MeV	0 - ~ 0 - 500 0 - 50,000	Surveying
Picker Pace 1 Gamma Ray Spectrometer	gamma	N/A	Measuring
Wallace Systems 1409 DSA Liquid Scintillation Counter Model A3255	beta alpha gamma	N/A	Measuring
The Nucleus Portable G-M Survey Meter Model S-101	beta alpha gamma	(Co-60) 1400 CPM/mR/hr	Surveying

10. Radiation Safety Program

Duties of the Radiation Safety Officer

The Radiation Safety Officer (RSO) will be responsible to the President of the University of Detroit Mercy for radiation safety at the University. It will be the responsibility of the RSO to recommend procedures for the construction of working areas and protection facilities, procurement, safe handling, monitoring, use and disposal of all radioactive sources. The RSO will be responsible for a periodic radiation survey of all lab areas employing a radiation source. It will be his responsibility to maintain records of receipt, use, and disposal of all radioactive materials. The RSO must be notified in case of accidents involving radioactive materials and will be responsible for the primary considerations involved in the prevention of the spread of contamination. The RSO may have one or more deputies.

Procedures for Ordering and Receiving Radioactive Material

1. Authorized users listed in Item 8 (above) may place and receive orders in amounts less than 1mCi. A copy of the purchase order request will be forwarded to the Radiation Safety Officer at the time of the request.
2. During off-duty hours, security personnel of the University of Detroit Mercy will accept delivery of radioactive packages in accordance with the procedures outlined below for the security personnel.

Procedures for Security Personnel - Receipt of Radioactive Material

MEMORANDUM TO: Security Personnel - University of Detroit

FROM: Michael J. Gleason, Ph.D., D.D.S.
University Radiation Safety Officer

SUBJECT: Receipt of Packages Containing Radioactive Material

Any packages containing radioactive material that arrive between 4:30 p.m. and 8:00 a.m., or on Saturdays or Sundays, shall be signed for by the security guard on duty and taken immediately to Room 201B in the Life Sciences Building. The package should be placed in the hood in the room, and the door should be relocked.

If the package is wet or appears to be damaged, immediately contact the University Radiation Safety Officer. Ask the carrier to remain at the security office until it can be determined that neither he nor the delivery vehicle is contaminated.

University Radiation Safety Officer: Michael Gleason, Ph.D., D.D.S.
Office Phone: (313) 446-1932
Home Phone: (313) 885-5432

Procedures for Opening Packages Containing Radioactive Material

1. Visually inspect package for any sign of damage (e.g., wetness, crushed). If damage is noted stop procedure and notify Radiation Safety Officer.
2. Measure exposure rate at 3 feet from package surface -- record. If $> 10\text{mR/hr}$ -- stop procedure and notify Radiation Safety Officer.
3. Measure surface exposure rate and record. If $> 200\text{ mR/hr}$ -- stop procedure and notify Radiation Safety Officer.
4. Put on gloves.
5. Open the outer package (following manufacturer's directions, if supplied) and remove packing slip. Open inner package to verify contents (compare requisition, packing slips, and label on bottle) check integrity of final source container (inspect for breakage of seals or vials, loss of liquid, discoloration of packing material). Check also that shipment does not exceed possession limits.
6. Wipe external surface of final source container with moistened cotton swab or filter paper held with forceps, assay and record.
7. Monitor the packing material and packages for contamination before discarding:
 - a. if contaminated, treat as radioactive waste.
 - b. if not, obliterate radiation labels before discarding in regular trash.

Procedures for Students and Other Personnel - Use of Radioactive Material

Students are not to enter the radiation laboratories without the supervision of persons authorized to use by-product, source and/or special nuclear material under the terms of the current NRC license. All students using the radiation laboratories will have basic training in radiation detection techniques. Housekeeping and security personnel who are allowed to enter the radiation laboratories are instructed by the person(s) authorized to use the by-product as to where the radioactive materials are stored and locked. Cleaning of the restricted storage areas shall be supervised by persons authorized to use the by-product, source and/or special nuclear material under the terms of the current NRC license. Security personnel are instructed in their responsibility to report promptly to the Radiation Safety Officer any conditions which may lead to or cause a violation of NRC regulations. All personnel working in the radiation laboratory

areas shall be instructed in the appropriate response to warnings made in the event of any unusual occurrences or malfunction that may involve exposure to radiation or radioactive materials. The extent of these instructions shall be commensurate with potential radiological health protection problems in the restricted area.

RADIATION LABORATORY REGULATIONS

1. Eating, drinking, smoking and the application of cosmetics in the laboratory is not permitted.
2. Pipetting or the performance of any similar operation will not be done by mouth suction.
3. Before a worker leaves the laboratory, the hands should be washed first, then checked with a beta-gamma survey meter. Contamination remaining after thorough washing should be reported.
4. If, in the course of work, personal contamination is suspected, a survey with a suitable instrument should be made immediately. This should be followed by the required cleansing and a further survey. Routine precautionary surveys should be made at intervals.
5. Gloves should be worn at all times when working with radioactive by-products.
6. No person should work in the laboratory without wearing an appropriate personnel monitoring device; e.g., film badge, or pocket ionization chamber.
7. Active liquid wastes should be poured into the labeled containers provided. They should never be poured into a standard drain.
8. Active solid wastes and contaminated materials should be placed in trash cans labeled "contaminated" or in designated containers.
9. Good housekeeping is encouraged at all times. Spillage should be prevented, but in the event of such an accident the following procedures should be followed:
 - a. The liquid should be blotted up. (Wear rubber gloves.)
 - b. All disposable materials contaminated by the spill and the cleaning process should be placed in a "contaminated" trash can.
 - c. The area of the spill and the type of activity should be clearly marked.

10. No apparatus should be washed in the public water-sewage system if it contains any activity appreciably above background when measured with a counter-type survey meter.
11. In general, active materials and contaminated materials are to be retained within the radioisotope laboratory and at specific points within the laboratory.
12. All wounds, spills and other emergencies should be reported to the instructor immediately.
13. Before leaving the laboratory, be sure all written records have been completed.
14. At the end of each day's work with labeled materials, appropriate rooms will be monitored by using a survey meter or making smear tests of the bench tops and the fume hood. The smears are to be checked by means of liquid scintillation counter.

RADIATION LABORATORY EMERGENCY PROCEDURES

a. Minor Spills Involving No Radiation Hazard to Personnel

1. Notify all other persons in the room at once.
2. Permit into the area only the minimum number of persons necessary to deal with the spill.
3. Confine the spill immediately.

Liquid Spills:

Don protective gloves.
Drop absorbent paper on spill.

Dry Spills:

Don protective gloves.
Dampen thoroughly, taking care not to spread the contamination.

4. Notify the Radiation Safety Officer as soon as possible.
5. Decontaminate.
6. Monitor all persons involved in the spill and cleaning.
7. Permit no person to resume work in the area until a survey is made, and approval of the Radiation Safety Officer is secured.
8. Prepare a complete history of the accident and subsequent activity related thereto for the laboratory records.

b. Major Spills Involving Radiation Hazard to Personnel

1. Notify all persons not involved in the spill to vacate the room at once.
2. If the spill is liquid and the hands are protected, right the container.
3. If the spill is on the skin, flush thoroughly.
4. If the spill is on clothing, discard outer or protective clothing at once.
5. Switch off all fans.
6. Vacate the room.
7. Notify the Radiation Safety Officer as soon as possible.
8. Take immediate steps to decontaminate personnel involved, as necessary.
9. Decontaminate the area. (Personnel involved in decontamination must be adequately protected.)
10. Monitor all persons involved in the spill and cleaning to determine adequacy of decontamination.
11. Permit no person to resume work in the area until a survey is made and approval of the Radiation Safety Officer is secured.
12. Prepare a complete history of the accident and subsequent activity related thereto for the laboratory records.

c. Injuries to Personnel Involving Radiation Hazard

1. Wash minor wounds immediately, under running water, while spreading the edges of the gash.
2. Report all radiation accidents to personnel (wounds, over-exposure, ingestion, inhalation) to the Radiation Safety Officer as soon as possible.
3. Call the Public Safety Office (emergency number, dial 123) and they will contact emergency medical services.
4. Permit no person involved in a radiation injury to return to work without the approval of the Radiation Safety Officer and the attending physician.
5. Prepare a complete history of the accident and subsequent activity related thereto for the laboratory records.

d. Fires or Other Major Emergencies

1. Notify all other persons in the room and building at once.
2. Attempt to put out fires if radiation hazard is not immediately present.
3. Notify the fire department and other local plant safety personnel.
4. Notify the Radiation Safety Officer.
5. Govern fire-fighting or other emergency activities by the restrictions of the Radiation Safety Officer.
6. Following the emergency, monitor the area and determine the protective devices necessary for safe decontamination.
7. Decontaminate.
8. Permit no person to resume work without approval of Radiation Safety Officer.
9. Monitor all persons involved in combating the emergency.
10. Prepare a complete history of the emergency and subsequent activity related thereto for the laboratory records.

Procedures for Plutonium-239

This neutron source (ZDF) is included in the program for recovering plutonium-beryllium neutron sources from learning institutions by Los Alamos National Laboratory. At this time Project Coordinator Sherry Jones estimates that the Laboratory will be able to accept transfer in March of 1997. The Pu-Be source will be stored in Room 201B of the Life Sciences Building until it is transferred to Los Alamos National Laboratory. Upon approval by Licensing this source will be leak tested with Siemens' Q1 Leak Test Kit. (Siemens Gammasonics, Inc., 2501 Barrington Road, Hoffman Estates, IL 60195-7312) Upon notification that no leakage is present, the source will be placed in its original shipping container. With the source in place in the shipping container, the container will be surveyed for cracks in the paraffin. If cracks are found, appropriate repairs will be made before moving the source to storage. At the time of transfer to Los Alamos National Laboratory, the source will be removed from the shipping container and leak tested to assure that no leakage has occurred before moving occurs.

11. Waste Management

Procedures for Radioactive Waste Disposal

All radioactive waste will be disposed of in accordance with 10 CFR part 20 sections 20.106, 20.301, 20.303, 20.305, and 20.306. Specifically, no radioactive material will be released into the sanitary sewer, into air or unrestricted areas, in excess of the quantities indicated in the above-noted section of 10 CFR part 20. All materials not meeting standards for safe disposal will be stored until they have decayed to an acceptable level for disposal.

(10-94)
10 CFR 30, 32, 33, 34, 35, 36, 39 and 40

APPLICATION FOR MATERIAL LICENSE

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST 9 HOURS. SUBMITTAL OF THE APPLICATION IS NECESSARY TO DETERMINE THAT THE APPLICANT IS QUALIFIED AND THAT ADEQUATE PROCEDURES EXIST TO PROTECT THE PUBLIC HEALTH AND SAFETY. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (T-8 F33) U.S. NUCLEAR REGULATORY COMMISSION WASHINGTON, DC 20555-0001 AND TO THE PAPERWORK REDUCTION PROJECT (3150-0120) OFFICE OF MANAGEMENT AND BUDGET WASHINGTON, DC 20503

INSTRUCTIONS: SEE THE APPROPRIATE LICENSE APPLICATION GUIDE FOR DETAILED INSTRUCTIONS FOR COMPLETING APPLICATION. SEND TWO COPIES OF THE ENTIRE COMPLETED APPLICATION TO THE NRC OFFICE SPECIFIED BELOW.

APPLICATION FOR DISTRIBUTION OF EXEMPT PRODUCTS FILE APPLICATIONS WITH:

DIVISION OF INDUSTRIAL AND MEDICAL NUCLEAR SAFETY
OFFICE OF NUCLEAR MATERIAL SAFETY AND SAFEGUARDS
U.S. NUCLEAR REGULATORY COMMISSION
WASHINGTON, DC 20555-0001

ALL OTHER PERSONS FILE APPLICATIONS AS FOLLOWS:

IF YOU ARE LOCATED IN:

CONNECTICUT, DELAWARE, DISTRICT OF COLUMBIA, MAINE, MARYLAND, MASSACHUSETTS, NEW HAMPSHIRE, NEW JERSEY, NEW YORK, PENNSYLVANIA, RHODE ISLAND, OR VERMONT, SEND APPLICATIONS TO:

LICENSING ASSISTANT SECTION
NUCLEAR MATERIALS SAFETY BRANCH
U.S. NUCLEAR REGULATORY COMMISSION, REGION I
475 ALLENDALE ROAD
KING OF PRUSSIA, PA 19406-1415

ALABAMA, FLORIDA, GEORGIA, KENTUCKY, MISSISSIPPI, NORTH CAROLINA, PUERTO RICO, SOUTH CAROLINA, TENNESSEE, VIRGINIA, VIRGIN ISLANDS, OR WEST VIRGINIA, SEND APPLICATIONS TO:

NUCLEAR MATERIALS LICENSING SECTION
U.S. NUCLEAR REGULATORY COMMISSION, REGION II
101 MARIETTA STREET, NW, SUITE 2900
ATLANTA, GA 30323-0199

IF YOU ARE LOCATED IN:

ILLINOIS, INDIANA, IOWA, MICHIGAN, MINNESOTA, MISSOURI, OHIO, OR WISCONSIN, SEND APPLICATIONS TO:

MATERIALS LICENSING SECTION
U.S. NUCLEAR REGULATORY COMMISSION, REGION III
801 WARRENVILLE RD
LISLE, IL 60532-4351

ALASKA, ARIZONA, ARKANSAS, CALIFORNIA, COLORADO, HAWAII, IDAHO, KANSAS, LOUISIANA, MONTANA, NEBRASKA, NEVADA, NEW MEXICO, NORTH DAKOTA, OKLAHOMA, OREGON, PACIFIC TRUST TERRITORIES, SOUTH DAKOTA, TEXAS, UTAH, WASHINGTON, OR WYOMING, SEND APPLICATIONS TO:

NUCLEAR MATERIALS LICENSING SECTION
U.S. NUCLEAR REGULATORY COMMISSION, REGION IV
811 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TX 76011-8064

PERSONS LOCATED IN AGREEMENT STATES SEND APPLICATIONS TO THE U.S. NUCLEAR REGULATORY COMMISSION ONLY IF THEY WISH TO POSSESS AND USE LICENSED MATERIAL IN STATES SUBJECT TO U.S. NUCLEAR REGULATORY COMMISSION JURISDICTIONS.

1. THIS IS AN APPLICATION FOR (Check appropriate item)

- ☐ A. NEW LICENSE
☐ B. AMENDMENT TO LICENSE NUMBER _____
☒ C. RENEWAL OF LICENSE NUMBER 21-00-241-09

2. NAME AND MAILING ADDRESS OF APPLICANT (Include Zip code)

University of Detroit Mercy
P.O. Box 19900
Detroit, MI 48219-0900

3. ADDRESS(ES) WHERE LICENSED MATERIAL WILL BE USED OR POSSESSED

4001 West McNichols Rd., Detroit, MI 48221
8200 Outer Drive, Detroit, MI 48235

4. NAME OF PERSON TO BE CONTACTED ABOUT THIS APPLICATION

Mr. Bradley N. Fitch, Chair
Radiation Safety Committee

TELEPHONE NUMBER

(313) 993-1587

SUBMIT ITEMS 5 THROUGH 11 ON 8-1/2 X 11" PAPER. THE TYPE AND SCOPE OF INFORMATION TO BE PROVIDED IS DESCRIBED IN THE LICENSE APPLICATION GUIDE.

5. RADIOACTIVE MATERIAL

a. Element and mass number, b. chemical and/or physical form, and c. maximum amount which will be possessed at any one time

6. PURPOSE(S) FOR WHICH LICENSED MATERIAL WILL BE USED

7. INDIVIDUAL(S) RESPONSIBLE FOR RADIATION SAFETY PROGRAM AND THEIR TRAINING EXPERIENCE

8. TRAINING FOR INDIVIDUALS WORKING IN OR FREQUENTING RESTRICTED AREAS

9. FACILITIES AND EQUIPMENT

10. RADIATION SAFETY PROGRAM

11. WASTE MANAGEMENT

12. LICENSEE FEES (See 10 CFR 170 and Section 170.31)

FEE CATEGORY Fee Exempt

AMOUNT ENCLOSED \$ N/A

13. CERTIFICATION (Must be completed by applicant) THE APPLICANT UNDERSTANDS THAT ALL STATEMENTS AND REPRESENTATIONS MADE IN THIS APPLICATION ARE BINDING UPON THE APPLICANT.

THE APPLICANT AND ANY OFFICIAL EXECUTING THIS CERTIFICATION ON BEHALF OF THE APPLICANT, NAMED IN ITEM 2, CERTIFY THAT THIS APPLICATION IS PREPARED IN CONFORMITY WITH TITLE 10, CODE OF FEDERAL REGULATIONS, PARTS 30, 32, 33, 34, 35, 36, 39 AND 40, AND THAT ALL INFORMATION CONTAINED HEREIN IS TRUE AND CORRECT TO THE BEST OF THEIR KNOWLEDGE AND BELIEF.

WARNING: 18 U.S.C. SECTION 1001 ACT OF JUNE 25, 1948 62 STAT. 749 MAKES IT A CRIMINAL OFFENSE TO MAKE A WILLFULLY FALSE STATEMENT OR REPRESENTATION TO ANY DEPARTMENT OR AGENCY OF THE UNITED STATES AS TO ANY MATTER WITHIN ITS JURISDICTION.

CERTIFYING OFFICER - TYPED/PRINTED NAME AND TITLE

Maureen A. Fay, O.P., Ph.D. - President

SIGNATURE

Maureen A. Fay

DATE

5-26-95

FOR NRC USE ONLY

TYPE OF FEE	FEE LOG	FEE CATEGORY	AMOUNT RECEIVED	CHECK NUMBER	COMMENTS
			\$		
APPROVED BY				DATE	

RECEIVED

JUN 1 1995

REGION III



May 26, 1995

Office of the President

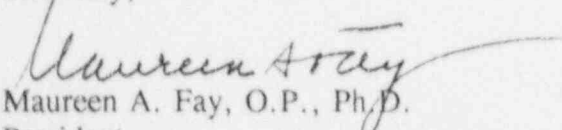
Materials Licensing Section
U.S. Nuclear Regulatory Commission, Region III
801 Warrenville Rd.
Lisle, IL 60532-4351

Gentlemen:

Attached is our renewal application, drafted to reflect our current program. Although several changes cannot be effected until approval of the renewal application, the major changes in the application are the following:

1. Activities utilizing by-product material now being conducted at the Dental Campus will be conducted at the Outer Drive Campus.
2. The plutonium-beryllium neutron source is scheduled for transfer to Los Alamos National Laboratory under their program for the recovery of neutron sources possessed by learning institutions and government agencies. Because of the current downsizing of government agencies at a rapid pace, and since these agencies take priority, the transfer of this neutron source will be delayed until at least March of 1997. We have been advised by Materials Licensing that since the NRC reinstated the annual fee exemption for nonprofit educational institutions, it is appropriate and will require less paperwork to include this source as a stored source under our existing license, rather than to request a separate storage license.
3. Dr. Leo Blackwell, the current Radiation Safety Officer, will continue his association with the University of Detroit Mercy, but will no longer be involved in radiation safety or the use of radioactive materials. He will, however, be available to the new Radiation Safety Officer, the Radiation Safety Committee and its Chair for consultation.

Sincerely,


Maureen A. Fay, O.P., Ph.D.
President

Enclosures

cc: Mr. Bradley N. Fitch, Chair, University Radiation Safety Committee
Dr. Michael Gleason, University Radiation Safety Officer

JUN 1 1995

4001 W. McNichols Road
PO Box 19900
Detroit, Michigan 48219-0900
313-993-1455

University of Detroit Mercy

APPLICATION FOR MATERIAL LICENSE
NRC FORM 313 (10-94)

5. Radioactive Material

<u>Element and Mass #</u>	<u>Chemical Form</u>	<u>Maximum Amount</u>
A. Iodine-125	A. Any	A. 2mCi
B. Phosphorus-32	B. Any	B. 5mCi
C. Carbon-14	C. Any	C. 15mCi
D. Hydrogen-3	D. Any	D. 25mCi
E. Calcium-45	E. Any	E. 5mCi
F. Sulfur-35	F. Any	F. 5mCi
G. Rubidium-86	G. Any	G. 5mCi
H. Plutonium-239	H. Encapsulated as Pu-Be neutron Source (NUMEC) <u>STORAGE ONLY</u>	H. 32 grams

6. Purpose(s) For Which Licensed Material Will Be Used

A - G In vitro studies and in vivo studies in laboratory animals for the training of undergraduate and graduate students.

H - Storage Only.

7. Individual(s) Responsible For Radiation Safety Program and Their Training and Experience

Michael Gleason, Ph.D., D.D.S.

Formal courses in Radiation Biology, Radiation Chemistry, and Radiation Physics as an undergraduate student at University of Dayton and a graduate student at Kent State University, further training as a post-doctoral fellow at Case Western Reserve University.

M. Gleason, Ph.D., D.D.S. - Experience in the Use of Radioactive Material:

ISOTOPE	MAXIMUM ACTIVITY	DURATION OF EXPERIENCE	TYPE OF USE
Hydrogen-3	5 mCi	20 Years	in vitro/in vivo
Carbon-14	1 mCi	20 Years	in vitro/in vivo
Phosphorus-32	1 mCi	10 Years	in vitro
Iodine-125	2 mCi	5 Years	in vitro

8. Training For Individuals Working In Or Frequenting Restricted Areas

Licensed material listed in item 5 above is to be used by or under the supervision of the following individuals. Training and experience is noted following the named individual.

Nancy Bow, M.S.

Formal courses in Nuclear Physics at the University of Detroit as an undergraduate and graduate student, as well as on the job training supervising the radiation laboratory.

N. Bow, M.S. - Experience in the Use of Radioactive Material:

ISOTOPE	MAXIMUM ACTIVITY	DURATION OF EXPERIENCE	TYPE OF USE
Pu-Be Neutron Source	2 Ci	30 Years	Teaching
Carbon-14	50 μ Ci	30 Years	Teaching
Cobalt-60	10 μ Ci	30 Years	Teaching
Cesium-137	10 μ Ci	30 Years	Teaching
Americium-241	0.12 μ Ci	15 Years	Teaching
Thallium-204	50 μ Ci	30 Years	Teaching

Mary Lou Caspers, Ph.D.

Formal courses in Radiation Biology, Radiation Chemistry, and Radiation Physics as an undergraduate and graduate student at the University of Detroit, Wayne State University, and National Institutes of Health.

M. L. Caspers, Ph.D. - Experience in the Use of Radioactive Materials:

ISOTOPE	MAXIMUM ACTIVITY	DURATION OF EXPERIENCE	TYPE OF USE
Hydrogen-3	5 mCi	20 Years	in vitro
Carbon-14	1 mCi	20 Years	in vitro
Phosphorus-32	1 mCi	20 Years	in vitro
Iodine-125	2 mCi	20 Years	in vitro
Lead-210	< 1 mCi	5 Years	in vitro

Michael Gleason, Ph.D., D.D.S.

(See Radiation Safety Officer above.)

Randal W. Rowland, M.S., D.M.D., M.S.D.

Formal courses in Radiation Physics and Radiation Biology, including Radiation Protection, Measurement, Calculation and Effects of Radiation at Medical College of Virginia, University of Alabama-Birmingham and the University of Kentucky.

R. W. Rowland, M.S., D.M.D., M.S.D. - Experience in the Use of Radioactive Materials:

ISOTOPE	MAXIMUM AMOUNT	DURATION OF EXPERIENCE	TYPE OF USE
Hydrogen-3	5 mCi	2 years	in vitro
Iodine-125	2 mCi	3 Years	in vitro

9. Facilities And Equipment

FACILITIES

By-product materials will be used or stored in two buildings on the McNichols Campus, located at 4001 W. McNichols Road, Detroit MI, 48221; and in one building on the Outer Drive Campus, located at 8200 Outer Drive, Detroit, MI 48235.

These facilities are described as follows:

The McNichols Campus

By-product materials will be used in Rooms 201B and 201A of the Life Sciences Building. Room 201B, which has a hood, is designated as a storage and preparation area; and 201A, an area where tracer amounts will be used. By-product materials will be used in Room 205 of the Chemistry Building. Storage and preparation of tracer amounts will be carried out in the hood available in Room 205.

The Outer Drive Campus

By-product materials will be used in Rooms 105A, 105 and 203 of the Science Center. Room 105A is designated as a storage area; Rooms 105 (which has a hood) and 203, as preparation areas.

EQUIPMENT

Radiation Detection Instruments

<u>MODEL NUMBER</u>	<u>RADIATION DETECTED</u>	<u>SENSITIVITY (mR/hr)</u>	<u>USE</u>
Victoreen - Model 450	gamma above 7 keV beta above 100 keV alpha above 4 MeV	0 - 5 0 - 500 0 - 50,000	Surveying
Picker Pace 1 Gamma Ray Spectrometer	gamma	N/A	Measuring
Wallace Systems 1409 DSA Liquid Scintillation Counter Model A3255	beta alpha gamma	N/A	Measuring
The Nucleus Portable G-M Survey Meter Model S-101	beta alpha gamma	(Co-60) 1400 CPM/mR/hr	Surveying

10. Radiation Safety Program

Duties of the Radiation Safety Officer

The Radiation Safety Officer (RSO) will be responsible to the President of the University of Detroit Mercy for radiation safety at the University. It will be the responsibility of the RSO to recommend procedures for the construction of working areas and protection facilities, procurement, safe handling, monitoring, use and disposal of all radioactive sources. The RSO will be responsible for a periodic radiation survey of all lab areas employing a radiation source. It will be his responsibility to maintain records of receipt, use, and disposal of all radioactive materials. The RSO must be notified in case of accidents involving radioactive materials and will be responsible for the primary considerations involved in the prevention of the spread of contamination. The RSO may have one or more deputies.

Procedures for Ordering and Receiving Radioactive Material

1. Authorized users listed in Item 8 (above) may place and receive orders in amounts less than 1mCi. A copy of the purchase order request will be forwarded to the Radiation Safety Officer at the time of the request.
2. During off-duty hours, security personnel of the University of Detroit Mercy will accept delivery of radioactive packages in accordance with the procedures outlined below for the security personnel.

Procedures for Security Personnel - Receipt of Radioactive Material

MEMORANDUM TO: Security Personnel - University of Detroit

FROM: Michael J. Gleason, Ph.D., D.D.S.
University Radiation Safety Officer

SUBJECT: Receipt of Packages Containing Radioactive Material

Any packages containing radioactive material that arrive between 4:30 p.m. and 8:00 a.m., or on Saturdays or Sundays, shall be signed for by the security guard on duty and taken immediately to Room 201B in the Life Sciences Building. The package should be placed in the hood in the room, and the door should be relocked.

If the package is wet or appears to be damaged, immediately contact the University Radiation Safety Officer. Ask the carrier to remain at the security office until it can be determined that neither he nor the delivery vehicle is contaminated.

University Radiation Safety Officer: Michael Gleason, Ph.D., D.D.S.

Office Phone: (313) 446-1932

Home Phone: (313) 885-5432

Procedures for Opening Packages Containing Radioactive Material

1. Visually inspect package for any sign of damage (e.g., wetness, crushed). If damage is noted stop procedure and notify Radiation Safety Officer.
2. Measure exposure rate at 3 feet from package surface -- record. If $> 10\text{mR/hr}$ -- stop procedure and notify Radiation Safety Officer.
3. Measure surface exposure rate and record. If $> 200\text{ mR/hr}$ -- stop procedure and notify Radiation Safety Officer.
4. Put on gloves.
5. Open the outer package (following manufacturer's directions, if supplied) and remove packing slip. Open inner package to verify contents (compare requisition, packing slips, and label on bottle) check integrity of final source container (inspect for breakage of seals or vials, loss of liquid, discoloration of packing material). Check also that shipment does not exceed possession limits.
6. Wipe external surface of final source container with moistened cotton swab or filter paper held with forceps, assay and record.
7. Monitor the packing material and packages for contamination before discarding:
 - a. if contaminated, treat as radioactive waste.
 - b. if not, obliterate radiation labels before discarding in regular trash.

Procedures for Students and Other Personnel - Use of Radioactive Material

Students are not to enter the radiation laboratories without the supervision of persons authorized to use by-product, source and/or special nuclear material under the terms of the current NRC license. All students using the radiation laboratories will have basic training in radiation detection techniques. Housekeeping and security personnel who are allowed to enter the radiation laboratories are instructed by the person(s) authorized to use the by-product as to where the radioactive materials are stored and locked. Cleaning of the restricted storage areas shall be supervised by persons authorized to use the by-product, source and/or special nuclear material under the terms of the current NRC license. Security personnel are instructed in their responsibility to report promptly to the Radiation Safety Officer any conditions which may lead to or cause a violation of NRC regulations. All personnel working in the radiation laboratory

areas shall be instructed in the appropriate response to warnings made in the event of any unusual occurrences or malfunction that may involve exposure to radiation or radioactive materials. The extent of these instructions shall be commensurate with potential radiological health protection problems in the restricted area.

RADIATION LABORATORY REGULATIONS

1. Eating, drinking, smoking and the application of cosmetics in the laboratory is not permitted.
2. Pipetting or the performance of any similar operation will not be done by mouth suction.
3. Before a worker leaves the laboratory, the hands should be washed first, then checked with a beta-gamma survey meter. Contamination remaining after thorough washing should be reported.
4. If, in the course of work, personal contamination is suspected, a survey with a suitable instrument should be made immediately. This should be followed by the required cleansing and a further survey. Routine precautionary surveys should be made at intervals.
5. Gloves should be worn at all times when working with radioactive by-products.
6. No person should work in the laboratory without wearing an appropriate personnel monitoring device; e.g., film badge, or pocket ionization chamber.
7. Active liquid wastes should be poured into the labeled containers provided. They should never be poured into a standard drain.
8. Active solid wastes and contaminated materials should be placed in trash cans labeled "contaminated" or in designated containers.
9. Good housekeeping is encouraged at all times. Spillage should be prevented, but in the event of such an accident the following procedures should be followed:
 - a. The liquid should be blotted up. (Wear rubber gloves.)
 - b. All disposable materials contaminated by the spill and the cleaning process should be placed in a "contaminated" trash can.
 - c. The area of the spill and the type of activity should be clearly marked.

10. No apparatus should be washed in the public water-sewage system if it contains any activity appreciably above background when measured with a counter-type survey meter.
11. In general, active materials and contaminated materials are to be retained within the radioisotope laboratory and at specific points within the laboratory.
12. All wounds, spills and other emergencies should be reported to the instructor immediately.
13. Before leaving the laboratory, be sure all written records have been completed.
14. At the end of each day's work with labeled materials, appropriate rooms will be monitored by using a survey meter or making smear tests of the bench tops and the fume hood. The smears are to be checked by means of liquid scintillation counter.

RADIATION LABORATORY EMERGENCY PROCEDURES

a. Minor Spills Involving No Radiation Hazard to Personnel

1. Notify all other persons in the room at once.
2. Permit into the area only the minimum number of persons necessary to deal with the spill.
3. Confine the spill immediately.

Liquid Spills:

- Don protective gloves.
- Drop absorbent paper on spill.

Dry Spills:

- Don protective gloves.
- Dampen thoroughly, taking care not to spread the contamination.

4. Notify the Radiation Safety Officer as soon as possible.
5. Decontaminate.
6. Monitor all persons involved in the spill and cleaning.
7. Permit no person to resume work in the area until a survey is made, and approval of the Radiation Safety Officer is secured.
8. Prepare a complete history of the accident and subsequent activity related thereto for the laboratory records.

b. Major Spills Involving Radiation Hazard to Personnel

1. Notify all persons not involved in the spill to vacate the room at once.
2. If the spill is liquid and the hands are protected, right the container.
3. If the spill is on the skin, flush thoroughly.
4. If the spill is on clothing, discard outer or protective clothing at once.
5. Switch off all fans.
6. Vacate the room.
7. Notify the Radiation Safety Officer as soon as possible.
8. Take immediate steps to decontaminate personnel involved, as necessary.
9. Decontaminate the area. (Personnel involved in decontamination must be adequately protected.)
10. Monitor all persons involved in the spill and cleaning to determine adequacy of decontamination.
11. Permit no person to resume work in the area until a survey is made and approval of the Radiation Safety Officer is secured.
12. Prepare a complete history of the accident and subsequent activity related thereto for the laboratory records.

c. Injuries to Personnel Involving Radiation Hazard

1. Wash minor wounds immediately, under running water, while spreading the edges of the gash.
2. Report all radiation accidents to personnel (wounds, over-exposure, ingestion, inhalation) to the Radiation Safety Officer as soon as possible.
3. Call the Public Safety Office (emergency number, dial 123) and they will contact emergency medical services.
4. Permit no person involved in a radiation injury to return to work without the approval of the Radiation Safety Officer and the attending physician.
5. Prepare a complete history of the accident and subsequent activity related thereto for the laboratory records.

d. Fires or Other Major Emergencies

1. Notify all other persons in the room and building at once.
2. Attempt to put out fires if radiation hazard is not immediately present.
3. Notify the fire department and other local plant safety personnel.
4. Notify the Radiation Safety Officer.
5. Govern fire-fighting or other emergency activities by the restrictions of the Radiation Safety Officer.
6. Following the emergency, monitor the area and determine the protective devices necessary for safe decontamination.
7. Decontaminate.
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Procedures for Plutonium-239

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11. Waste Management

Procedures for Radioactive Waste Disposal

All radioactive waste will be disposed of in accordance with 10 CFR part 20 sections 20.106, 20.301, 20.303, 20.305, and 20.306. Specifically, no radioactive material will be released into the sanitary sewer, into air or unrestricted areas, in excess of the quantities indicated in the above-noted section of 10 CFR part 20. All materials not meeting standards for safe disposal will be stored until they have decayed to an acceptable level for disposal.

FEB 27 1997

Maureen A. Fay, O.P., Ph.D.
President
University of Detroit Mercy
Post Office Box 19900
Detroit, MI 48219-0900

Dear Dr. Fay:

Enclosed is Amendment No. 07 renewing your NRC Material License No. 21-00241-09 in accordance with your request.

Please review the enclosed document carefully and be sure that you understand all conditions. If there are any errors or questions, please notify the U.S. Nuclear Regulatory Commission, Region III office at (630) 829-9887 so that we can provide appropriate corrections and answers.

Please be advised that your license expires at the end of the day, in the month, and year stated in the license. Unless your license has been terminated, you must conduct your program involving byproduct materials in accordance with the conditions of your NRC license, representations made in your license application, and NRC regulations. In particular, note that you must:

1. Operate in accordance with NRC regulations 10 CFR Part 19, "Notices, Instructions and Reports to Workers; Inspections," 10 CFR Part 20, "Standards for Protection Against Radiation," and other applicable regulations.
2. Notify NRC, in writing, within 30 days:
 - a. When the Radiation Safety Officer permanently discontinues performance of duties under the license or has a name change; or
 - b. When the licensee's mailing address changes (no fee is required if the location of byproduct material remains the same).
3. In accordance with 10 CFR 30.36(b) and/or license condition, notify NRC, promptly, in writing, and request termination of the license when you decide to terminate all activities involving materials authorized under the license.
4. Request and obtain a license amendment before you:
 - a. Change Radiation Safety Officers;

398655

- b. Order byproduct material in excess of the amount, or radionuclide, or form different than authorized on the license;
 - c. Add or change the areas of use or address or addresses of use identified in the license application or on the license; or
 - d. Change ownership of your organization.
5. Submit a complete renewal application with proper fee or termination request at least 30 days before the expiration date of your license. You will receive a reminder notice approximately 90 days before the expiration date. Possession of byproduct material after your license expires is a violation of NRC regulations. A license will not normally be renewed, except on a case-by-case basis, in instances where licensed material has never been possessed or used.

In addition, please note that NRC Form 313 requires the applicant, by his/her signature, to verify that the applicant understands that all statements contained in the application are true and correct to the best of the applicant's knowledge. The signatory for the application should be the licensee or certifying official rather than a consultant.

You will be periodically inspected by NRC. Failure to conduct your program in accordance with NRC regulations, license conditions, and representations made in your license application and supplemental correspondence with NRC will result in enforcement action against you. This could include issuance of a notice of violation, or imposition of a civil penalty, or an order suspending, modifying or revoking your license as specified in the General Policy and Procedures for NRC Enforcement Actions. Since serious consequences to employees and the public can result from failure to comply with NRC requirements, prompt and vigorous enforcement action will be taken when dealing with licensees who do not achieve the necessary meticulous attention to detail and the high standard of compliance which NRC expects of its licensees.

Sincerely,
Original Signed By
James R. Mullauer, M.H.S.
Health Physicist
Nuclear Materials Licensing Branch

License No.: 21-00241-09

Docket No.: 030-14288

Enclosure: Amendment No. 07

DOCUMENT NAME: M:\03014288.CL6

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OFFICE	DNMS/RIII								
NAME	JMULLAUER:jaw								
DATE	12-18-96 3/25/97								

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UNITED STATES
NUCLEAR REGULATORY COMMISSION

REGION III
801 WARRENVILLE ROAD
LISLE, ILLINOIS 60532-4351

February 24, 1997

96-81

MEMORANDUM TO: B. J. Holt, Chief
Nuclear Materials Licensing Branch

FROM: Bruce L. Jorgensen, Chief 
Decommissioning Branch

SUBJECT: RESPONSE TO REQUEST FOR TECHNICAL
ASSISTANCE REGARDING UNIVERSITY OF
DETROIT MERCY (CONTROL NO. 398655)

In a Request for Technical Assistance dated December 19, 1996, you requested our review of data and information submitted by the University of Detroit Mercy regarding the releasing for unrestricted use and deleting as locations of use, Rooms 403, 407, 408, 421 and 501 of Mercy's Dinan Hall, 2985 East Jefferson, Detroit, Michigan (License No. 21-00241-09). Based on our review of the information provided, this would normally be classified as a Type III Decommissioning. However, we have determined that it would be appropriate to evaluate this as a Type II.

According to the licensee, the only isotope ever used in the specified rooms was Ca-45, and this was only used in Room 403, and was only used one time. The quantity used was 1 millicurie (mCi).

Based on the *NMSS Handbook for Decommissioning Fuel Cycle and Materials Licensees*, a Type III Decommissioning evaluation is indicated for Ca-45. However, the handbook states that licensees who used only small quantities of H-3 or C-14 can decommission under a Type II or III Decommissioning. Since Ca-45, like H-3 and C-14, only has a low energy beta, as well as a much shorter half-life, it was determined that Ca-45 could be treated the same as H-3 and C-14. Since the quantity used in this case was small, as well as a one time use, it was deemed to be appropriate to conduct the review at the Type II level. As such, our review under the Type II criteria has concluded that the information submitted by the licensee was adequate to demonstrate that Rooms 403, 407, 408, 421 and 501 of the licensee's facility are free of radiological contamination and would not pose a health and safety concern to members of the public. Based on our review, these rooms may be released for unrestricted use and removed from the license as locations of use. Neither a closeout inspection or confirmatory survey are considered necessary to be performed. The technical basis for our position is provided below.

CONTACT: William Snell
(630) 829-9871

The 1 mCi of Ca-45 that was acquired was received on February 4, 1993, and used on February 8, 1993. With a half-life of 162.7 days, this would have decayed to a current quantity of about 2.2 microcuries (μCi). The Ca-45 was received as $^{45}\text{CaCl}_2$ and the stock solution was transferred to a petri dish. Teeth with dental sealants were placed in the solution for two hours. The teeth and the stock bottle were then rinsed in running water for 24 hours at 4 liters/minute. All materials except the teeth were stored for 8 half-lives. On July 10, 1996, the materials were surveyed with a GM pancake probe and all measurements indicated background. In addition, the licensee performed scans of the floors, benches and in hoods in the above rooms with a GM pancake probe and identified no areas above background. Wipes were also taken in hoods and sinks and on the floor and lab benches. These wipes were counted via liquid scintillation in the beta windows for H-3, C-14, S-35 and Ca-45, and all results indicated background.

As an upper bound, the 10 CFR Part 20 Appendix B Ingestion ALI is 2000 μCi , which equates to 5000 millirem dose per year. If the entire 2.2 μCi was still available and ingested, a resulting annual dose would only be 2.5 millirem. This is considerably less than the annual allowable dose to a member of the public of 100 millirem. Considering the materials were rinsed for 24 hours, any postulated scenario that could result in the ingestion of residual Ca-45 would clearly result in no dose of consequence. It is also worth noting that the 10 CFR Part 30.71 Schedule B exempt quantity for Ca-45 is 10 μCi , which is almost a factor of 5 greater than the time decayed quantity of 2.2 μCi .

DEC 26 1996

96-81

REQUEST FOR TECHNICAL ASSISTANCE

DATE: December 19, 1996
TO: Bruce Jorgensen, Chief, Decommissioning Branch, Region III
FROM: B.J. Holt, Chief, Nuclear Materials Licensing Branch, RIII
LICENSEE: University of Detroit Mercy
LICENSE NO. 21-00241-09
CONTROL NO. 398655

Problem/Issue:

The subject license is currently being reviewed for renewal and as part of the renewal the licensee is decommissioning 5 of its laboratories. Hydrogen-3 was primarily used in these laboratories and on 1 occasion, 1 millicurie of calcium-45 was used in 1993. Enclosed is a letter dated 5/4/96, containing the close-out survey for these 5 laboratories. We believe the laboratories are suitable for unrestricted use. Bill Snell has already seen this letter and is already familiar with its contents.

Action Requested:

Please review the close-out survey and provide guidance if additional information or actions are needed. Please notify the Licensing Branch of the results of your review.

Contact: James R. Mullauer, ext. 9873

Attachments: Ltr dtd 12/4/1996

DOCUMENT NAME: M:\03014288.TR6

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OFFICE	DNMS/RIII	DNMS/RIII							
NAME	JMULLAUER:jaw	BHOLT							
DATE	12/1/96	12/1/96							

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Office of the President

December 4, 1996

James R. Mullauer, M.H.S.
Health Physicist
Nuclear Materials Licensing Branch
United States Nuclear Regulatory Commission
Region III
801 Warrenville Road
Lisle, IL 60532-4351

Re: Control Number 398655

Dear Mr. Mullauer:

Please pardon our delay in answering your letter of September 11, 1996. We felt it necessary to purchase some new equipment to facilitate the answers to questions you raised about releasing our Jefferson Avenue facility for unrestricted use. The collection and analysis of data is presented below, and we hope that this additional information satisfactorily addresses the issue of removable contamination in Dinan Hall.

1. Authorized Place of Use

a. A resurvey of the fourth and fifth floors of Dinan Hall utilizing a Victoreen Thyac IV Survey Meter with a "pancake" GM probe reveals no activity above background (0.02 mr/hour) on lab benches, in hoods, or the floor. Attachments one (1) and two (2) show the floor plan and the areas tested for removable contamination. Attachment three (3) gives the results of these wipe test surveys in dpm/100 cm². These wipe tests surveys made for removable contamination demonstrate no removable hydrogen-3 contamination above 1000 dpm/100 cm². In addition an examination of windows set to evaluate removable contamination contributed by more energetic beta emitters (carbon-14, sulfur-35, calcium-45), show no cpm above background confirming the survey with the GM survey meter showing only background activity (0.02 mr/hr).

b. We have purchased a Victoreen Thyac IV Survey Meter (Model 290) with a "pancake" GM probe (Model 489-110C). The calibration data for this instrument is included in attachment four (4). Information on the sensitivity of this instrument is discussed under 4 below - Survey Instrument Calibration.

RECEIVED

DEC 17 1996

REGION III

4001 W.McNichols Road
P.O. Box 19900
Detroit, Michigan 48219-0900

Mr. James R. Mullauer, M.H.S.

December 4, 1996

Page 2

Hydrogen-3 wipe test for surface contamination was measured with a Wallac Systems 1409 DSA Liquid Scintillation Counter, Model A3255. This counter provides for the examination of hydrogen-3 in dpm/100 cm² as well as three windows for the examination of beta emitters with higher energies in cpm/100 cm². Internal standards for hydrogen-3 traceable to what was NBS were used to confirm that the standards provided with the instrument were reliable for the counting procedures used in the wipe test assay (See Attachment three).

c. One millicurie of Calcium-45 (assayed for February 4, 1993) arrived on February 5, 1993 and was used on February 8, 1993. This isotope was in the chemical form of ⁴⁵CaCl₂ and the stock solution was transferred to a petri dish by washing the stock bottle so that the resulting solution in the petri dish was 100 µCi/ml. Teeth with dental sealants being studied for leakage were placed in the solution and left for 2 hours. The teeth as well as the stock bottle were rinsed in running water (4 l/min) for 24 hours using the laboratory sink in room 403 DH. During the 24 hour period about 6000 liters of rinse water flowed into the sanitary sewer. Therefore one millicurie of Calcium-45 as calcium chloride was diluted well below the 0.2 nCi/ml required for disposal in the sanitary sewer when the building waste water is added to this total effluent. The petri dish, teeth, stock bottle, and other materials used in the experiment were monitored and were found to have an activity of 0.035 mr/hr while background was around 0.02 mr/hr. All materials except the teeth were stored for approximately 8 half lives and monitored with a Victoreen Model 450 Ion Chamber survey meter on July 10, 1996. Only background radiation was detected (0.02 mr/hr). Even though an ion chamber survey meter was used to estimate residual activity we are confident that any residual activity was within the limits provided for in CFR 20.1301 since most of the original activity was disposed of in the sanitary sewer as a part of the experimental protocol.

2. Authorized Users

Please list Professor Nancy Bow as the authorized user for the Plutonium-239 Beryllium neutron source. It is our intent to transfer the Plutonium-239 source to Los Alamos within the next two years.

3. Facilities

The term "acute experiments" is used in the physiological sense, that is experimental work on any animal will be carried out in an authorized laboratory, with the animal being killed at the end of the experiment. Thus any animal used for experimental purposes involving radioactive materials would be removed from the animal quarters before the administration of radioactive materials, and the animal would not return to the animal quarters after the end of the experiment.

Mr. James R. Mullauer, M.H.S.
December 4, 1996
Page 3

4. Survey Instrument Calibration

Your letter of July 11, 1996, under item 8 states, "If you intend to contract out the calibration of your instruments, you only need to specify the name of the firm and the license number or submit a copy of the license that authorizes the firm to perform calibration services." Medical Physics Consultant, INC (NRC License 21-20153-01) currently calibrates our survey instruments once a year. We intend to continue with that calibration frequency as required by our current license.

We have purchased a Victoreen Thyac IV Survey Meter (Model 290) with a "pancake" GM probe (Model 489-110C) which is capable of detecting alpha emitters with energies above 3.5 MeV, beta emitters with energies above 35 keV, and gamma emitters above 6 keV minimum. In addition to the operational check source (Cesium-137) provided with the instrument the university has the following standard reference sources traceable to what was NBS: Carbon-14, 0.01 μCi ; Strontium-90, 0.09 μCi ; Bismuth-210, 0.021 μCi ; Plutonium-237, 0.000788 μCi . The minimum detectable activity (MDA) will vary with the yield (mainly efficiency) of the probe for the isotope analyzed. The above standard reference sources reveal that this instrument has an MDA for Carbon-14 of about 0.0002 μCi , Strontium-90 of about 0.00004 μCi , Bismuth-210 of about 0.00007 μCi and for Plutonium-239 of about 0.0005 μCi if one assumes a reasonable estimate of the count rate is twice the background count. A Wallac liquid scintillation counter is available for wipe test analysis of H-3 beta activity measurement as outlined above.

5. Personnel Monitoring

It is important to emphasize that usage of isotopes occurs in any given laboratory only once or twice a year. In routine handling (transfer of tracer amounts from stock solutions of isotope for experimental use) an individual would only receive in one hour (at 30 cm) a dose of 0.56 mrem if 1 mCi of Rubidium was involved and 0.33 mrem if 0.5 mCi of Iodine-125 was involved (Rubidium-86 and Iodine-125 have gamma factors (Γ) of 0.5 and 0.6 rem/mCi-hour respectively at 1 cm). These estimates are based on an one hour work time and a two minute preparation time is usual. Therefore, we feel strongly that the most effective way of insuring that laboratory workers do not exceed 10% of the regulatory limits noted in 10 CFR 20.1201(a) is a survey at the end of the work day when isotopes are used, or an immediate survey and decontamination if necessary, when a spill is suspected.

6. Area Monitoring

Surveys will occur at the end of each day that isotopes are used in the laboratory. Decontamination procedures will be instituted immediately if contamination (any dpm above background) is

Mr. James R. Mullauer, M.H.S.

December 4, 1996

Page 4

discovered or if a spill occurs during experimental activity. Work will be stopped immediately and decontamination procedures instituted at that time.

7. Material Control and Inventory

No transfer or transportation of licensed material between authorized users within our institution or transfers and transportation of licensed material to other licensees outside our institution will occur, the only exception being the Plutonium source when it is transferred to Los Alamos. The transfer of this source was addressed in our application.

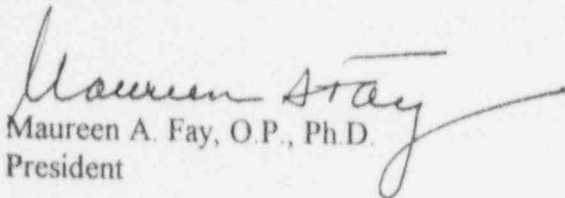
8. Waste Disposal

All radioactive waste with half-lives greater than 65 days will be disposed of as required by 20.2003.

Radioactive waste with half lives of 65 days and less will be stored for 10 half-lives then surveyed in a low background area with a low-level survey meter with all shielding removed and then disposed of as normal trash when the radiation level is at background. All radioactive material labels will be defaced or removed from all containers, etc.

Thank you for your patience in working with us in revising our NRC byproduct materials license. Once again forgive our delay in responding to your letter of September 11, 1996.

Sincerely,


Maureen A. Fay, O.P., Ph.D.
President

MAF/bf/grb

Key: O = Office

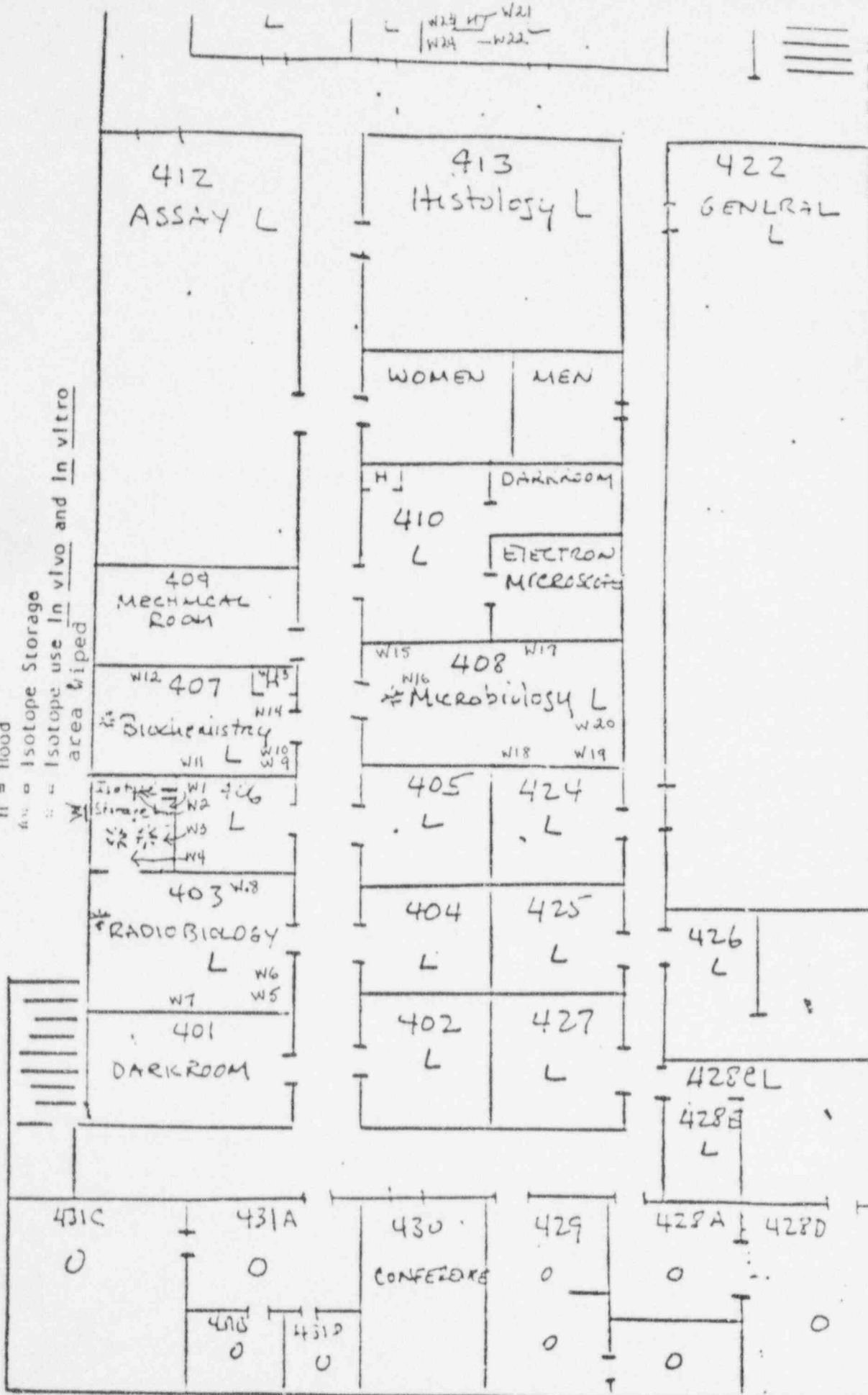
I = Laboratory

H = Hood

IS = Isotope Storage

IS = Isotope use In vivo and In vitro area wiped

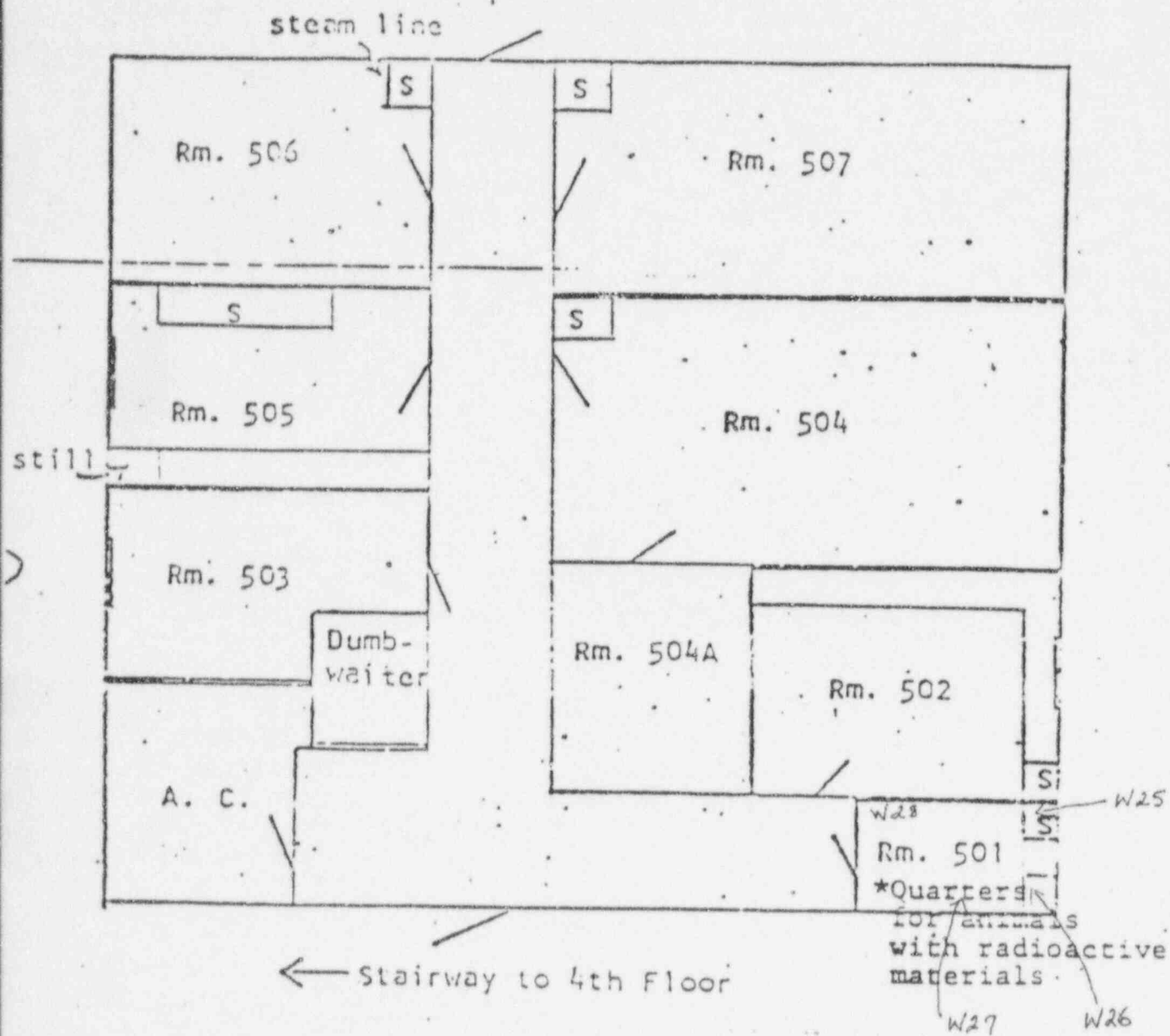
Attachment



5th Floor Dinan Hall Dental School
Animal Quarters

Attachment 2

* area wiped



Attachment 3

WIPE TEST RESULTS

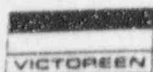
4th and 5th Floors - Dinan Hall

Room # wipe test #	Area	³ H dpm/100cm ²	W-1 cpm/100cm ²	W-2 cpm/100cm ²	W-3 cpm/100cm ²
403 a-1	Hood	13	164	13	3
403 a-2	Floor	43	101	9	3
403 a-3	Sink	40	77	13	4
403 a-4	Floor	48	80	13	2
403-5	Sink	32	94	11	2
403-6	Floor	15	98	10	4
403-7	Lab Bench	40	95	12	3
403-8	Lab Bench	46	83	12	3
407-9	Sink	44	115	12	2
407-10	Floor	41	63	13	3
407-11	Lab Bench	47	65	12	3
407-12	Lab Bench	34	51	10	4
407-13	Hood	15	94	11	3
407-14	Floor	39	66	13	3
408-15	Sink	37	77	12	4
408-16	Floor	50	72	11	2
408-17	Lab Bench	42	63	11	3
408-18	Lab Bench	41	52	11	3
408-19	Sink	36	50	12	4
408-20	Floor	41	61	13	3
421-21	Hood	45	66	12	3
421-22	Floor	37	58	11	4
421-23	Sink	41	72	14	4
421-24	Sink	39	84	12	5
501-25	Sink	39	37	11	3
501-26	Lab Bench	40	51	12	2
501-27	Lab Bench	36	63	14	3
501-28	Floor	46	77	12	3

W-1 → β energy ³H, ¹⁴CW-2 → β energy ¹⁴C, ³⁵SW-3 → β energy ⁴⁵Ca

Standard	³ H dpm	W-1 cpm	W-2 cpm	W-3 cpm
³ H 0.01μCi	9584	431	10	3
³ H 0.005μCi	4606	301	12	3
Wallac ³ H Std. *	177,950	113,645	670	3
Packard ³ H Std. **	36,641	22,293	42	4
Wallac ¹⁴ C Std. ***	17,289	20,515	77,292	16
Wallac Blank	34	25	13	2
Packard Blank	13	20	17	4
Wipe Test Blank	45	87	13	3
Wipe Test Blank	51	35	12	2
Wipe Test Blank	39	31	12	3

* 191,900 dpm 3/1/94 ** 155,800 dpm 5/8/70 *** 100,700 dpm 3/94



Survey Meter Calibration Report / Certificate of Calibration

Customer UNIVERSITY OF DETROIT MERCY

Order PO # 42761

Victoreen # 284224

Model 290 w/ 489-110

Serial Nos. 2289 2946

CALIBRATION NOTES

Radiation levels are based on standards whose calibrations are traceable to the N.I.S.T. (formerly N.B.S.)

The suggested re-calibration date is only a suggestion. The actual frequency of re-calibration may vary depending on Federal, state or local requirements.

During calibration the GM probe was positioned perpendicular to the beam axis with the beta shield closed. For the check source the beta shield was open.

The source used for calibration was Cs-137.

All readings below 10 mR/h were corrected for Background Radiation.

The formula for % Error is:

$$(\text{Reading} - \text{Rate}) / \text{Rate} \times 100$$

IMPORTANT

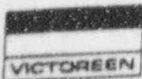
Any corrections made to the instrument readings (e.g. Energy Dependence) are up to the user to apply. Care must be used in applying those factors.

The test response data is on page two (2) of this report.

6000 Cochran Road
Cleveland, Ohio 44139-3395
(216) 248-9300
FAX (216) 248-9301
DATA (216) 248-9043

Victoreen, Inc.

Attachment 4 continued



Model 290 w/ 489-110
Serial Nos. 2289 2946

CALIBRATION DATA

RATE

	Range	Rate (mR/h)	Reading (mR/h)	% Error
	X 100	80.0	78.0	-2.50
	X 100	24.6	24.0	-2.40
	X 10	7.65	7.68	0.39
	X 10	2.37	2.38	0.42
	X 1	0.743	0.780	4.98
	X 1	0.233	0.240	3.00
	X .1	0.055	0.058	5.07
	X .1	0.018	0.018	1.41
Background	X .1	N/A	0.020	N/A
Check Source	X 10	N/A	3	N/A

DOSE

	Range	Exposure (mR)	Reading (mR)	% Error
	X 1	0.765	0.760	-0.65

USRCAL = .16

Calibrated by Dennis Cameron

11-Oct-96

Operational checkout by Jeff Keller

04-Oct-96

Suggested re-cal due 11-Oct-97

Traceable to the N.I.S.T.
Test No. DG 8953/89
Dated FEB. 8, 1989
FTW Chamber Model 30-349
Serial No. 610

6000 Cochran Road
Cleveland, Ohio 44139-3395
(216) 248-9300
FAX (216) 248-9301
DATA (216) 248-9043



Office of the President

December 4, 1996

James R. Mullauer, M.H.S.
Health Physicist
Nuclear Materials Licensing Branch
United States Nuclear Regulatory Commission
Region III
801 Warrenville Road
Lisle, IL 60532-4351

Re: Control Number 398655

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RECEIVED

DEC 17 1996

REGION III

DEC 17 1996

4001 W. McNichols Road
P.O. Box 19900
Detroit, Michigan 48219-0900
313-993-1455

Hydrogen-3 wipe test for surface contamination was measured with a Wallac Systems 1409 DSA Liquid Scintillation Counter, Model A3255. This counter provides for the examination of hydrogen-3 in dpm/100 cm² as well as three windows for the examination of beta emitters with higher energies in cpm/100 cm². Internal standards for hydrogen-3 traceable to what was NBS were used to confirm that the standards provided with the instrument were reliable for the counting procedures used in the wipe test assay (See Attachment three).

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3. Facilities

The term "acute experiments" is used in the physiological sense; that is experimental work on any animal will be carried out in an authorized laboratory, with the animal being killed at the end of the experiment. Thus any animal used for experimental purposes involving radioactive materials would be removed from the animal quarters before the administration of radioactive materials, and the animal would not return to the animal quarters after the end of the experiment.

Mr. James R. Mullauer, M.H.S.

December 4, 1996

Page 3

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5. Personnel Monitoring

It is important to emphasize that usage of isotopes occurs in any given laboratory only once or twice a year. In routine handling (transfer of tracer amounts from stock solutions of isotope for experimental use) an individual would only receive in one hour (at 30 cm) a dose of 0.56 mrem if 1 mCi of Rubidium was involved and 0.33 mrem if 0.5 mCi of Iodine-125 was involved (Rubidium-86 and Iodine-125 have gamma factors (Γ) of 0.5 and 0.6 rem/mCi-hour respectively at 1 cm). These estimates are based on an one hour work time and a two minute preparation time is usual. Therefor we feel strongly that the most effective way of insuring that laboratory workers do not exceed 10% of the regulatory limits noted in 10 CFR 20.1201(a) is a survey at the end of the work day when isotopes are used, or an immediate survey and decontamination if necessary, when a spill is suspected.

6. Area Monitoring

Surveys will occur at the end of each day that isotopes are used in the laboratory. Decontamination procedures will be instituted immediately if contamination (any dpm above background) is

Mr. James R. Mullauer, M.H.S.

December 4, 1996

Page 4

discovered or if a spill occurs during experimental activity. Work will be stopped immediately and decontamination procedures instituted at that time.

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No transfer or transportation of licensed material between authorized users within our institution or transfers and transportation of licensed material to other licensees outside our institution will occur, the only exception being the Plutonium source when it is transferred to Los Alamos. The transfer of this source was addressed in our application.

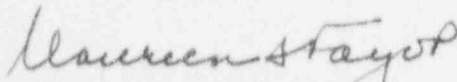
8. Waste Disposal

All radioactive waste with half-lives greater than 65 days will be disposed of as required by 20.2003.

Radioactive waste with half lives of 65 days and less will be stored for 10 half-lives then surveyed in a low background area with a low-level survey meter with all shielding removed and then disposed of as normal trash when the radiation level is at background. All radioactive material labels will be defaced or removed from all containers, etc.

Thank you for your patience in working with us in revising our NRC byproduct materials license. Once again forgive our delay in responding to your letter of September 11, 1996.

Sincerely,



Maureen A. Fay, O.P., Ph.D.
President

MAF/bf/grb

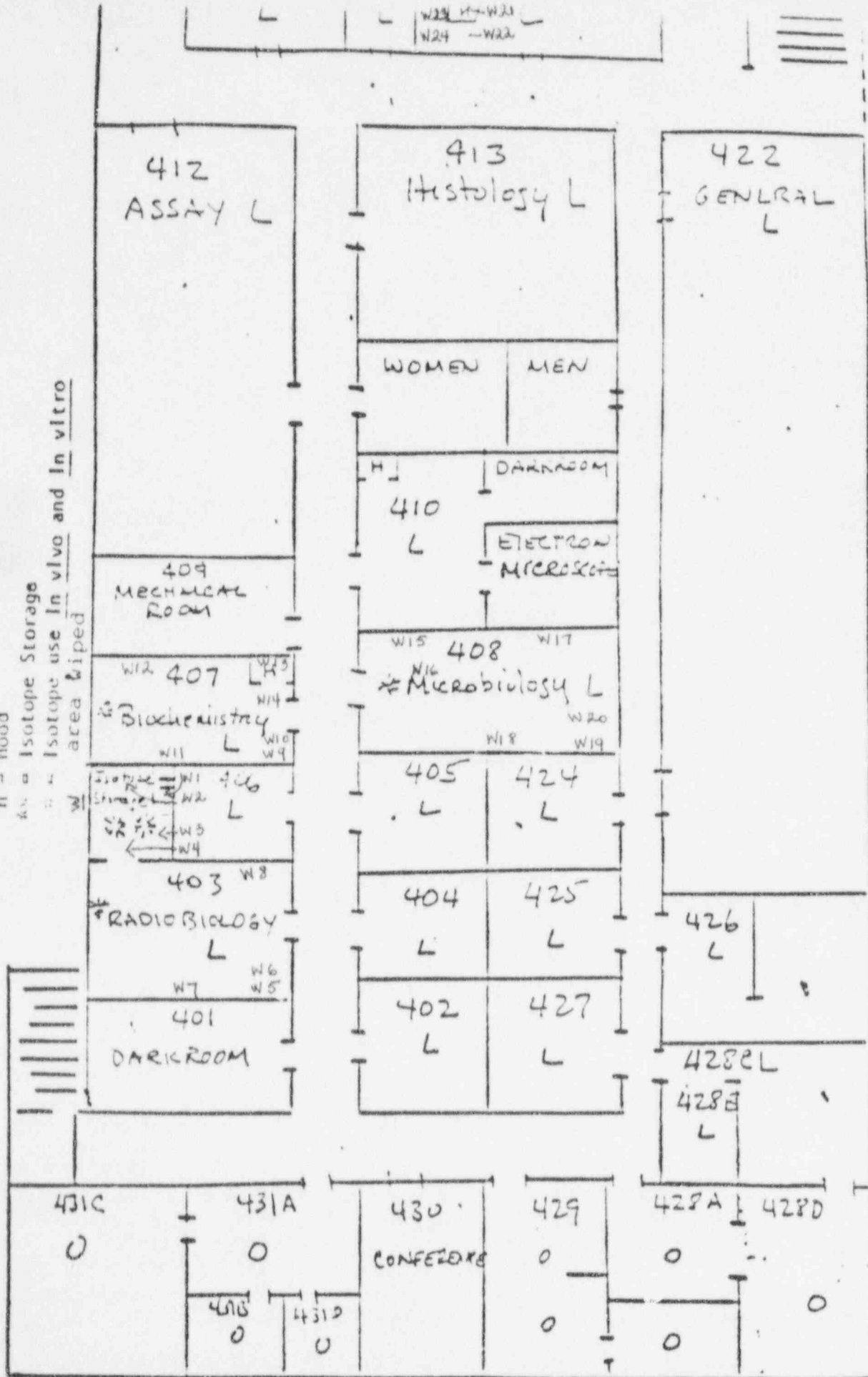
Key: O = Office

L = Laboratory

H = Hood

IS = Isotope Storage

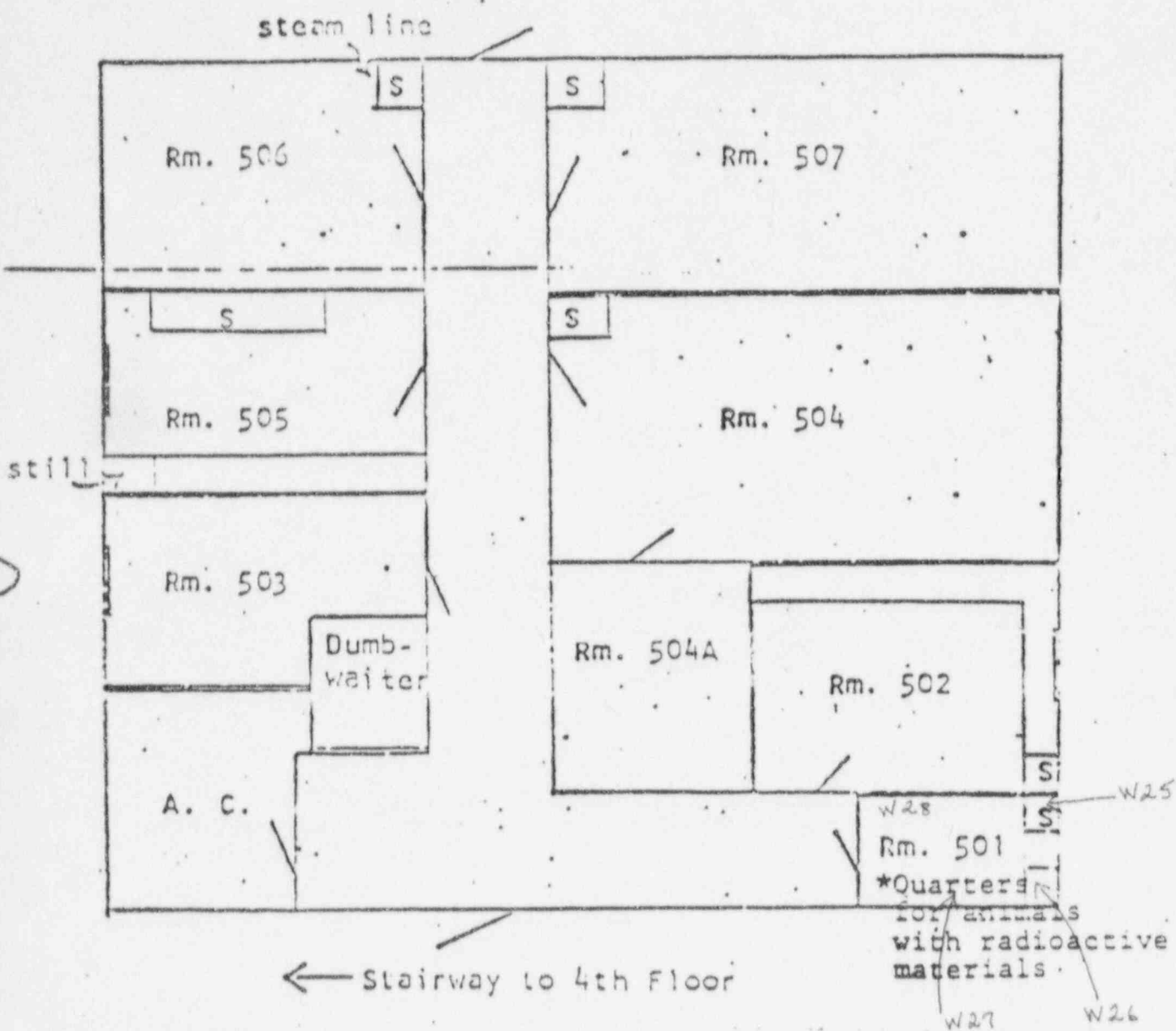
IS = Isotope use In vivo and In vitro
area Wiped



5th Floor Dinan Hall Dental School
Animal Quarters

Attachment 2

* area wiped



Attachment 3

WIPE TEST RESULTS

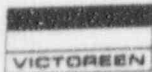
4th and 5th Floors - Dinan Hall

Room # wipe test #	Area	³ H dpm/100cm ²	W-1 cpm/100cm ²	W-2 cpm/100cm ²	W-3 cpm/100cm ²
403 a-1	Hood	13	164	13	3
403 a-2	Floor	43	101	9	3
403 a-3	Sink	40	77	13	4
403 a-4	Floor	48	80	13	2
403-5	Sink	32	94	11	2
403-6	Floor	15	98	10	4
403-7	Lab Bench	40	95	12	3
403-8	Lab Bench	46	83	12	3
407-9	Sink	44	115	12	2
407-10	Floor	41	63	13	3
407-11	Lab Bench	47	65	12	3
407-12	Lab Bench	34	51	10	4
407-13	Hood	15	94	11	3
407-14	Floor	39	66	13	3
408-15	Sink	37	77	12	4
408-16	Floor	50	72	11	2
408-17	Lab Bench	42	63	11	3
408-18	Lab Bench	41	52	11	3
408-19	Sink	36	50	12	4
408-20	Floor	41	61	13	3
421-21	Hood	45	66	12	3
421-22	Floor	37	58	11	4
421-23	Sink	41	72	14	4
421-24	Sink	39	84	12	5
501-25	Sink	39	37	11	3
501-26	Lab Bench	40	51	12	2
501-27	Lab Bench	36	63	14	3
501-28	Floor	46	77	12	3

W-1 → β energy ³H, ¹⁴CW-2 → β energy ¹⁴C, ³⁵SW-3 → β energy ⁴⁵Ca

Standard	³ H dpm	W-1 cpm	W-2 cpm	W-3 cpm
³ H 0.01μCi	9584	431	10	3
³ H 0.005μCi	4606	301	12	3
Wallac ³ H Std. *	177,950	113,645	670	3
Packard ³ H Std. **	36,641	22,293	42	4
Wallac ¹⁴ C Std. ***	17,289	20,515	77,292	16
Wallac Blank	34	25	13	2
Packard Blank	13	20	17	4
Wipe Test Blank	45	87	13	3
Wipe Test Blank	51	35	12	2
Wipe Test Blank	39	31	12	3

* 191,900 dpm 3/1/94 ** 155,800 dpm 5/8/70 *** 100,700 dpm 3/94

Victoreen, Inc.

Survey Meter Calibration Report / Certificate of Calibration

Customer UNIVERSITY OF DETROIT MERCY

Cust PO # 42761

Victoreen # 284224

Model 290 w/ 489-110

Serial Nos. 2289 2946

CALIBRATION NOTES

Radiation levels are based on standards whose calibrations are traceable to the N.I.S.T. (formerly N.B.S.)

The suggested re-calibration date is only a suggestion. The actual frequency of re-calibration may vary depending on Federal, state or local requirements.

During calibration the GM probe was positioned perpendicular to the beam axis with the beta shield closed. For the check source the beta shield was open.

The source used for calibration was Cs-137.

All readings below 10 mR/h were corrected for Background Radiation.

The formula for % Error is:

$$(\text{Reading} - \text{Rate}) / \text{Rate} \times 100$$

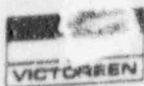
IMPORTANT

Any corrections made to the instrument readings (e.g. Energy Dependence) are up to the user to apply. Care must be used in applying those factors.

The test response data is on page two (2) of this report.

6000 Cochran Road
Cleveland, Ohio 44139-3395
(216) 248-9300
FAX (216) 248-9301
DATA (216) 248-9043

Victoreen, Inc.



Model 290 w/ 489-110
Serial Nos. 2289 2946

CALIBRATION DATA

RATE

	Range	Rate (mR/h)	Reading (mR/h)	% Error
	X 100	80.0	78.0	-2.50
	X 100	24.6	24.0	-2.40
	X 10	7.65	7.68	0.39
	X 10	2.37	2.38	0.42
	X 1	0.743	0.780	4.98
	X 1	0.233	0.240	3.00
	X .1	0.055	0.058	5.07
	X .1	0.018	0.018	1.41
Background	X .1	N/A	0.020	N/A
Check Source	X 10	N/A	3	N/A

DOSE

	Range	Exposure (mR)	Reading (mR)	% Error
	X 1	0.765	0.760	-0.65

USRCAL = .16

Calibrated by Julius Camer 11-Oct-96

Operational checkout by Jeff Kaler 04-Oct-96

Suggested re-cal due 11-Oct-97

Traceable to the N.I.S.T.
Test No. DG 8953/89
Dated FEB. 8, 1989
PTW Chamber Model 30-349
Serial No. 610

6000 Cochran Road
Cleveland, Ohio 44139-3395
(216) 248-9300
FAX (216) 248-9301
DATA (216) 248-9043



School of Dentistry

September 20, 1996

James R. Mullauer, M.H.S.
Health Physicist Nuclear Materials Licensing Branch
United States Nuclear Regulatory Commission
Region III
801 Warrenville Road
Lisle, IL 60532-4351

Re: Control Number 398655

Dear Mr. Mullauer:

Your letter of September 11, 1996 to Sister Fay reached my desk yesterday, and I want to assure you, as I did last summer, that our response will be timely. If it is not possible to respond to the questions that remain concerning our NRC license renewal by November 1, 1996 I will let you know by October 21, 1996.

A quick perusal of your letter of September 11, 1996 prompts me to observe that your offer to call you concerning questions about our license renewal might very well facilitate our efforts and minimize your time, thus I am confident you will be hearing from me several times prior to October 21, 1996.

Sincerely,

Leo H. Blackwell, Ph.D.
Radiation Safety Officer

RECEIVED
SEP 23 1996
REGION III

Pm: 9-20-96

2985 E. Jefferson Avenue
Detroit, Michigan 48207-4282
313-446-1800

SEP 23 1996

SEP 11 1996

Maureen A. Fay, O.P., Ph.D.
President
University of Detroit Mercy
P.O. Box 19900
Detroit, MI 48219-0900

Dear Dr. Fay:

We reviewed your response letter dated July 31, 1996, providing additional information regarding your application for renewal of your NRC license. It appears that you adequately addressed certain questions we had regarding your application, however, certain issues were not addressed and still remain open. Please be advised that we cannot renew your NRC license until each area in this letter have been adequately addressed. **Enclosed** are excerpts of regulatory guides that may be helpful in providing the minimum acceptable standards for issuance of an NRC license. To help assure completeness and accuracy, please address each item in the same order as this letter.

1. Authorized Place of Use

✓ Item No. 1 of your letter specified that the only isotope that was used at Dinan Hall, Room 403 was calcium-45 and the last experiment was conducted in February of 1993 and that all equipment and unused stock solutions were stored for 10 half lives and disposed of. Item No. 1 further specifies that all radioisotope approved areas were surveyed on July 10, 1996, with a Victoreen Model 450 Ion Chamber and no contamination was found. This information raises the following concerns: (1) Since calcium-45 has a half life of 163 days, it would take approximately 4.5 years to decay 10 half lives, a period of time that has not yet elapsed and (2) an Ion Chamber may not be the best suited instrument to measure beta contamination. Ion Chambers are typically used to quantify moderate to high gamma radiation levels. Further, it appears that no assessment was made to verify that there is no removable contamination in Dinan Hall, room 403. Again be advised that we cannot authorized release of the Jefferson Avenue facility for unrestricted use until you perform and provided the results of your closeout surveys which shows the residual radiation levels and the levels of residual removable contamination using appropriate instrumentation. We have **enclosed** for your convenience another copy of the criteria for release of facilities for unrestricted use. Therefore, please provide the following information:

- a. Results of surveys using appropriate instrumentation in milliroentgen per hour (Mr/hr) and of wipe test surveys made for removable contamination using appropriate instrumentation in disintegrations per minute per 100 square centimeters (dpm/100 cm²).

- b. The manufacturer, model number, and sensitivity of radiation detection instruments used to perform these measurements.
- c. The date of disposal of the calcium-45 used and a discussion showing how you determined that the calcium-45 was determined to be decayed and not distinguishable from background.

2. ✓ Authorized Users

Item No. 4 of your letter states that there will be no authorized users for the Plutonium-239 Beryllium neutron source since it will be in storage only. Please be advised that there needs to be an authorized user for each type of radioactive material listed on a license whether in storage or not. Therefore it appears that Dr. Bow should still be listed as the authorized user of the Plutonium-239 source until such time as it is transferred to Los Alamos. Please also confirm that it is your intent to either dispose or transfer the Plutonium-239 source within the next two years.

3. Facilities

How long do experiments last?
Item No. 7 of your letter states that no animal experiments will be conducted that will require housing and/or animal caretakers; i.e., any animal experiments conducted will be acute experiments. It is unclear why experimental animals would require no housing or caretakers and the meaning of "acute experiments" is unclear. Please clarify.

4. Survey Instrument Calibration

✓ Item No. 8 of your letter does not address the frequency that your survey instruments will be calibrated and does not address how your counting equipment used to analyze wipes for removable contamination will be calibrated. Please state the frequency that your instruments will be calibrated and discuss the calibration and the minimum detectable activity (MDA) of your counting equipment.

5. Personnel Monitoring

✓ Item No. 9 of your letter states that you believe that the amounts requested with the reevaluation of your current needs would indicate that no individual is likely to receive exposure in excess of the limits of 10 CFR 20.1502. 10 CFR 20.1502 requires each licensee to supply and require the use of individual monitoring devices by adults likely to receive, in 1 year a radiation dose in excess of 10 percent of the limits in 10 CFR 20.1201(a). Please provide your criteria for determining which individuals are likely to exceed or not exceed 10% of the regulatory limits. These criteria should consider both routine handling and accidents which are likely to occur, such as spills.

6. Area Monitoring

✓ Item No. 11 of your letter does not discuss action levels for radiation and contamination surveys and the actions to be taken when these limits are exceeded. Please specify your action levels at which point decontamination procedures will be implemented.

7. Material Control and Inventory

✓ Item No. 13 of your letter did not address the information requested in Item 13, paragraph b, of our letter. Therefore, please provide your procedures for transfer and transportation of licensed material between authorized users at your facility, and your procedures for transfer and transportation of licensed material to other licensees. Describe your program to control such transfers, including update of material inventory and audits of users' procedures.

8. Waste Disposal

Item No. 16 of your letter did not address the information requested in Item 16 of our letter. Therefore, please provide the following:

- a. your procedures for disposal of licensed radioactive waste by decay-in-storage. Your procedures will need to provide assurance that you will:
 1. Hold the radioactive waste with a half life of 65 days and less in storage for at least 10 half-lives,
 2. Survey the waste in a low background area with a low-level survey meter with all the shielding removed,
 3. Not dispose of the waste as normal trash unless the radiation level is at background,
 4. Remove or deface the radioactive material labels or otherwise indicate that containers no longer hold radioactive materials, and
- b. If you will be storing radioactive materials with half lives greater than 65 days but less than 120 days, you need to provide the information requested in **enclosure I "DECAY-IN-STORAGE OF RADIOACTIVE MATERIALS WITH HALF-LIVES GREATER THAN 65 DAYS"**.
- c. Please be advised that current NRC policy does not allow for "Decay-in-Storage" of radioactive material with half lives greater than 120 days since currently a disposal site is accepting low level radioactive waste. Since you request possession of calcium-45, please discuss your method of disposal.

M. Fay

-4-

- c. Your procedures for waste disposal references outdated regulations in the old 10 CFR Part 20. The regulations in 10 CFR Part 20 were revised on January 1, 1994. Please review the new 10 CFR Part 20 and reference the appropriate parts of the new Part 20.

We will continue our review of your application upon receipt of this information. Please reply in duplicate, within 20 days, and refer to Control Number 398655.

If you have any questions or require clarification on any of the information stated herein, you may contact me at (630) 829-9873.

Sincerely,

Original Signed By
James R. Mullauer, M.H.S.
Health Physicist
Nuclear Materials Licensing Branch

License No. 21-00241-09
Docket No. 030-14288

DOCUMENT NAME: M:\03014288.DF6

To receive a copy of this document, indicate in the box: "C" = Copy without attachment/enclosure "E" = Copy with attachment/enclosure "N" = No copy

OFFICE	DNMS/RIII								
NAME	JRMullauer/brt								
DATE	09/11/96								

OFFICIAL RECORD COPY



July 31, 1996

Office of the President

James R. Mullauer, M.H.S.
Nuclear Materials Licensing Branch
U.S. Nuclear Regulatory Commission
801 Warrenville Road
Lisle, IL 60532-4351

Dear Mr. Mullauer:

RE: Control Number 398655

I am addressing the information you requested by number and title as outlined in your letter of June 11, 1996. In reviewing the information we are providing, please note the changes in Maximum Amount by-product requested which follows.

Element and Mass #	Chemical Form	Maximum Amount
A. Iodine-125	A. Any	A. 0.5 mCi
B. Phosphorus-32	B. Any	B. 0.5 mCi
C. Carbon-14	C. Any	C. 2 mCi
D. Hydrogen-3	D. Any	D. 5 mCi
E. Calcium-45	E. Any	E. 1 mCi
F. Sulfur-35	F. Any	F. 1 mCi
G. Rubidium-86	G. Any	G. 1 mCi

1. Authorized Place of Use

The only isotope that has been used at the 2985 East Jefferson facility (Dinan Hall Room 403) was Calcium-45. In vitro use of this isotope occurred in μ Ci amounts, the last experiment in February of 1993. All of the equipment used (glassware, rubber gloves, pipettes, paper products, etc.) and the unused stock solution were stored for 10 half lives and disposed of. Only room 403 in Dinan Hall was used for experimental

RECEIVED

AUG 6 - 1996

REGION III

4001 W. McNichols Road
P.O. Box 19900
Detroit, Michigan 48219-0900
313-993-1455

AUG 06 1996

PM: 8-2-96

procedures involving Calcium-45. All of the areas approved for isotope use in our current license were surveyed even though no experimental isotope work was undertaken. These areas were surveyed on July 10, 1996, with a Victroeen Model 450 Ion Chamber Survey Meter and no evidence of surface contamination was found. A copy of the most recent calibration and sensitivity of this instrument is attached for your information (Attachment 1).

2. **Licensee's Name**

On December 21, 1990, the University of Detroit merged with Mercy College of Detroit. The University of Detroit and Mercy College of Detroit, each Michigan nonprofit corporations engaged in furnishing academic courses and awarding academic degrees, merged their assets so that the University of Detroit is the surviving corporation under the new name "University of Detroit Mercy." The acquired person was Mercy College of Detroit, 8200 W. Outer Drive, Detroit, Michigan 48219. The acquiring person is University of Detroit, 4001 W. McNichols, Detroit Michigan 48221. In consideration of the merger, the University of Detroit acquired the assets of Mercy College of Detroit and assumed the liabilities of Mercy College of Detroit.

Given the above, a change of ownership of the University of Detroit has not occurred. The University of Detroit Mercy has continued its operations under the NRC license and by-product material approvals that were issued to the University of Detroit since it is one and the same institution.

3. **Deletion of Radioactive Material**

The isotopes deleted from our current license were never procured, thus their deletion.

4. **Authorized Users**

Please note that we are asking that the Plutonium-239-Beryllium neutron source be licensed for storage only, therefore there will be no users. Dr. Gleason should be listed for all materials, and Dr. Rowland listed for Hydrogen-3 and Iodine-125.

5. **Duties of the Radiation Safety Officer (RSO) and Management Control**

- a. The radiation safety officer will audit and review laboratory records on a quarterly basis. He will be available on request to help each of the authorized users if necessary. Each user is responsible for surveys, wipe tests, etc., of his or her own laboratory.
- b. The statement "the RSO may have one or more deputies" is unnecessary for the current program needs and should be deleted.

- c. In our application, please add the following under item 10 Radiation Safety Program (page 5)

THE RADIATION SAFETY COMMITTEE

The Radiation Safety Committee is composed of one administrator representing the President of the University, and four faculty members knowledgeable about radioactive isotopes and ionizing radiation. The Radiation Safety Committee will review and recommend changes in the current NRC license and review with the Radiation Safety Officer his records and ensure compliance with the NRC license and the University's radiation safety program. The committee will meet at least twice a year for these activities.

6. Training

Each individual approved for isotope use is responsible for instructing his or her personnel concerning the safety procedures, maintenance, security, etc., involved in isotope work in the laboratory. These procedures will be reviewed at least annually, and records of this training and review will be maintained with the radiation safety records of each laboratory.

7. Facilities

- a. No animal experiments will be conducted that will require housing and/or animal caretakers; i.e., any animal experiments conducted will be acute experiments. Animal carcasses will be frozen and stored for decay if necessary.
- b. Diagrams of the floor plans of isotope storage and usage areas on the McNichols campus and the Outer Drive campus are attached (Attachments 2,3,4 and 5). As noted in our application, both of these areas have hoods where storage and preparation will occur. Although lead bricks are available in these hoods, the isotopes and their quantities would not require special shielding or handling equipment.
- c. Since writing our current application, we have built a more secure storage area in the Engineering Building (Room 372) where the Plutonium-239 source is located. Therefore, it is unnecessary to move this source to the Life Science Building as proposed in our application. A diagram of this area is appended (Attachment 6). Professor Bow and the Radiation Safety Officer are the only personnel that have access to this area. Professor Bow will check on the posting and security of this source on a monthly basis.

Sherry Jones of Los Alamos National Laboratory (referenced in our application) indicated in a telephone conversation on July 30, 1996, that they anticipate they will be able to accept transfer of the Plutonium-239 source in April 1997.

8. Survey Instrument Calibration

Medical Physics Consultants, INC. (NRC License 21-20153-01) currently calibrates our survey instrument.

9. Personnel Monitoring

We believe that the amounts requested with the reevaluation of our current needs, indicated above, would indicate that no individual is likely to receive exposures in excess of the limitations of 10 CFR 20.1502.

10. Bioassays

See item 9 above.

11. Area Monitoring

As noted in item 5a above, each individual approved for by-product material usage is responsible for radiation safety in his or her laboratory. The use of radioactive materials in any given laboratory is infrequent. During the time an experiment involving radioactive materials is underway, the individual responsible for isotope usage will monitor the area during the work and survey for contamination at the end of each work day. Records of isotope usage and survey of work area will be recorded by this individual. These records will be reviewed by the RSO during his quarterly visits to each laboratory and by the Radiation Safety Committee at their semi-annual meetings.

12. Effluent Monitoring

The only isotopes requested that could not be practically stored for 10 half lives are Hydrogen- 3 and Carbon-14. These isotopes will be disposed of only as authorized by 10 CFR 20.2005.

13. Material Control and Inventory

In item 10, page 5, of our application titled "Radiation Safety Program," please note the following change:

Procedures for Ordering and Receiving Radioactive Material

1. Authorized users listed in Item 8 (above) will send their request for radioactive material to the RSO. The RSO will transfer the request to purchasing after determining that the licensed material possession limits for the University are not exceeded.

2. The radioactive material purchased will be delivered directly to the authorized user by the shipper chosen by the provider.

14. Records

The University will maintain records as required by 10 CRF 20.2101, 20.2102, and 20.2103 including items a-h listed in your letter of June 11, 1996.

15. General Laboratory Safety Instructions

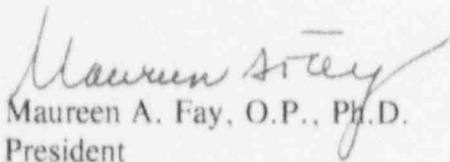
General Laboratory Safety Instructions in our application will be modified to reflect items a - j as outlined in your letter of June 11.

16. Waste Disposal

Please refer to the attached diagrams for decay-in-storage areas. The areas noted with two asterisks (**) for isotope storage are adequate to store stock as well as items for decay-in-storage (Attachments 2, 3, and 5). As noted above each individual approved for the use of radioactive materials is responsible for the materials he or she is using. They alone have access to the area where isotopes are stored and used and will survey and record the results of storage decay.

We trust that you will find this an acceptable response to your letter of June 11, 1996, regarding our application.

Sincerely,


Maureen A. Fay, O.P., Ph.D.
President

Attachments

cc: George Lundy, S.J., Ph.D., Vice President for Academic Affairs and Provost
Leo Blackwell, Radiation Safety Officer
Bradley N. Fitch, Chair, Radiation Safety Committee

ATTACHMENT 1

MEDICAL PHYSICS CONSULTANTS, INC.

2309 Shelby
Ann Arbor, Michigan 48103
(313) 662-3197

CERTIFICATE OF INSTRUMENT CALIBRATION

Facility: University of Detroit Mercy

Instrument: Manufacturer - Victoreen
Type - Ion Chamber
Model Number - 450
Serial Number - 1482
Probe Type - N/A

Calibration Geometry: Chamber perpendicular to source.
└ = perpendicular // = parallel On sticker

Calibration Source: Exposure Rate at Specified Distance Calibration Accuracy
Cs - 137 34.67 mR/h at 1m on 5/17/95 +/- 3% NBS
Original Calibration Date: 12/6/83
NRC License 21-20153-01

Calibration Data:

	Exposure rate	Instrument Reading	Correction Factor	Exposure rate	Instrument Reading	Correction Factor	Avg. Scale Correction Factor
Range	(mSv/h)	(mR/h)		(mR/h)	(mR/h)		
0-1	0.3	0.32	0.938	0.7	0.72	0.971	1.0
1-10	3.0	3.1	0.968	7.0	7.0	1.0	1.0
10-100	30	30	1.0	70	68	1.029	1.0
100-1000	300	300	1.0	700	670	1.045	1.0

Dedicated source check: N/A
Battery check reading: N/A (internal check, ok)
High Voltage: N/A
Repairs: None

Date Received: 11/9/95 Date Calibrated: 11/21/95

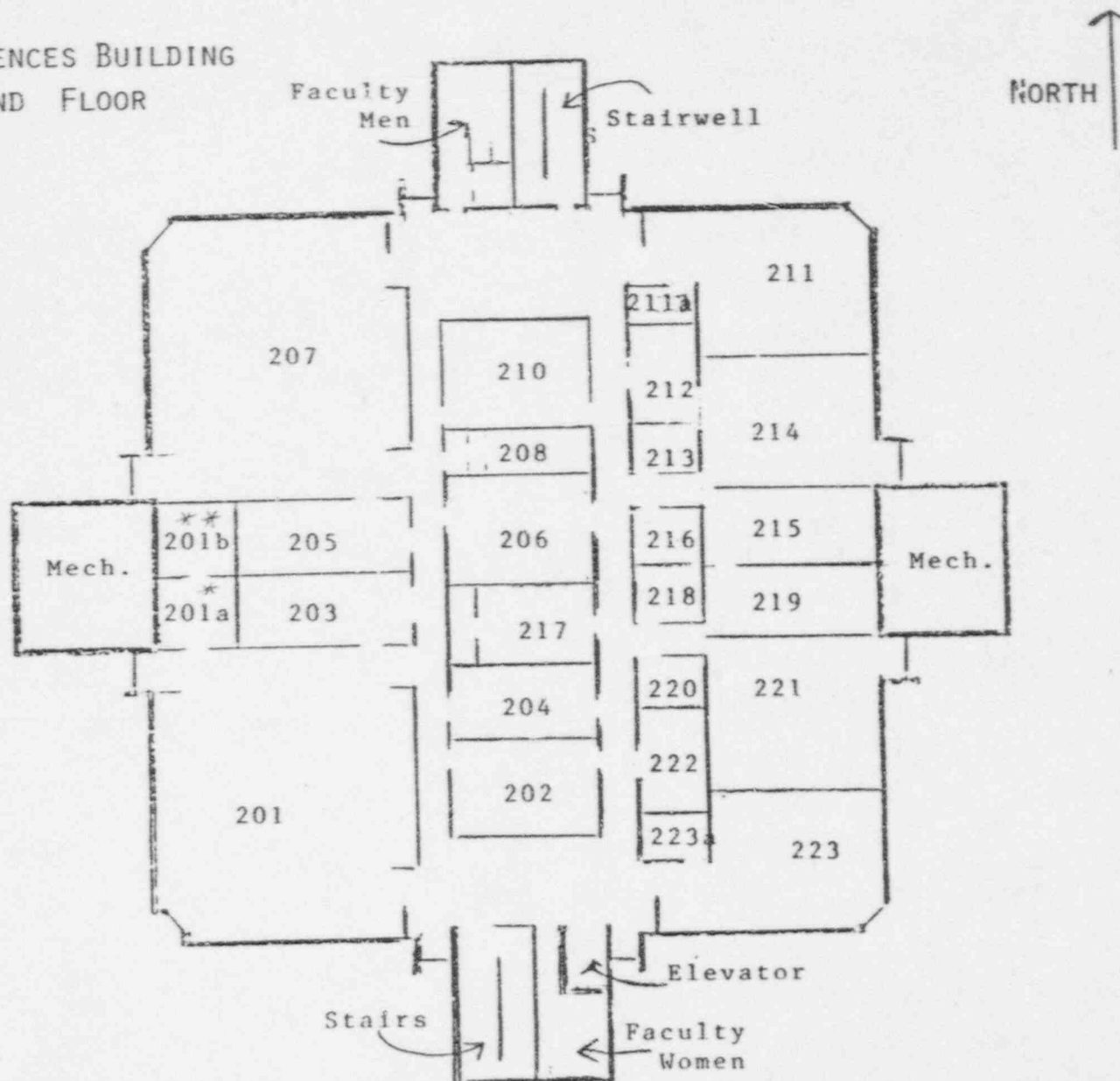
Comments: All instrument readings are within +/- 10% for all scales used. Drift check was acceptable. Please note any applicable average scale correction factors in order to obtain accurate readings in mR/h.

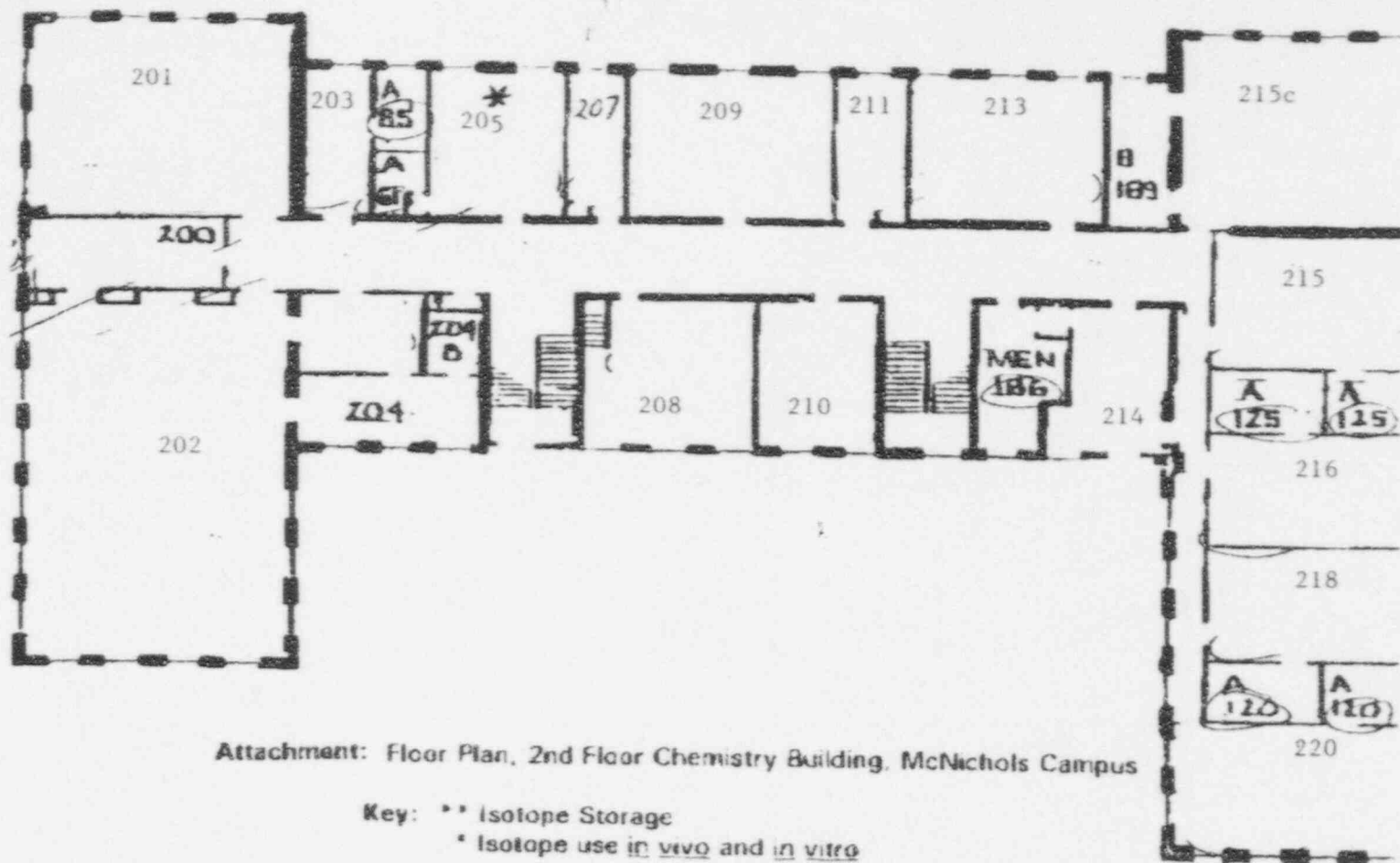
Note: This instrument should be checked for proper operation with a dedicated check source prior to use.

Calibrated by: Christine Widmayer
Christine Widmayer, B.S.

MPC ver 2.1

LIFE SCIENCES BUILDING
SECOND FLOOR



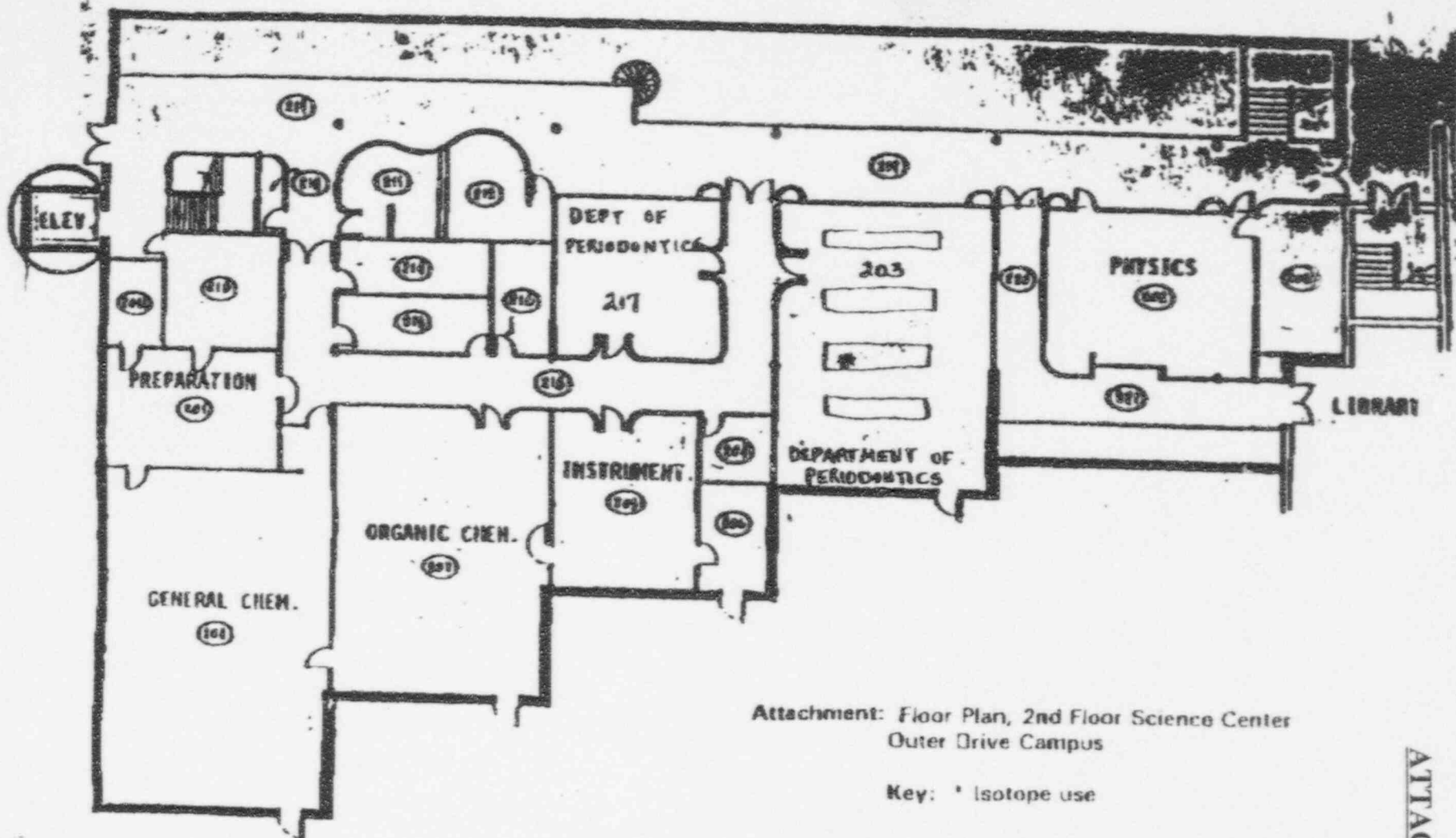


Attachment: Floor Plan, 2nd Floor Chemistry Building, McNichols Campus

Key: ** Isotope Storage
* Isotope use in vivo and in vitro



CHEMISTRY BUILDING



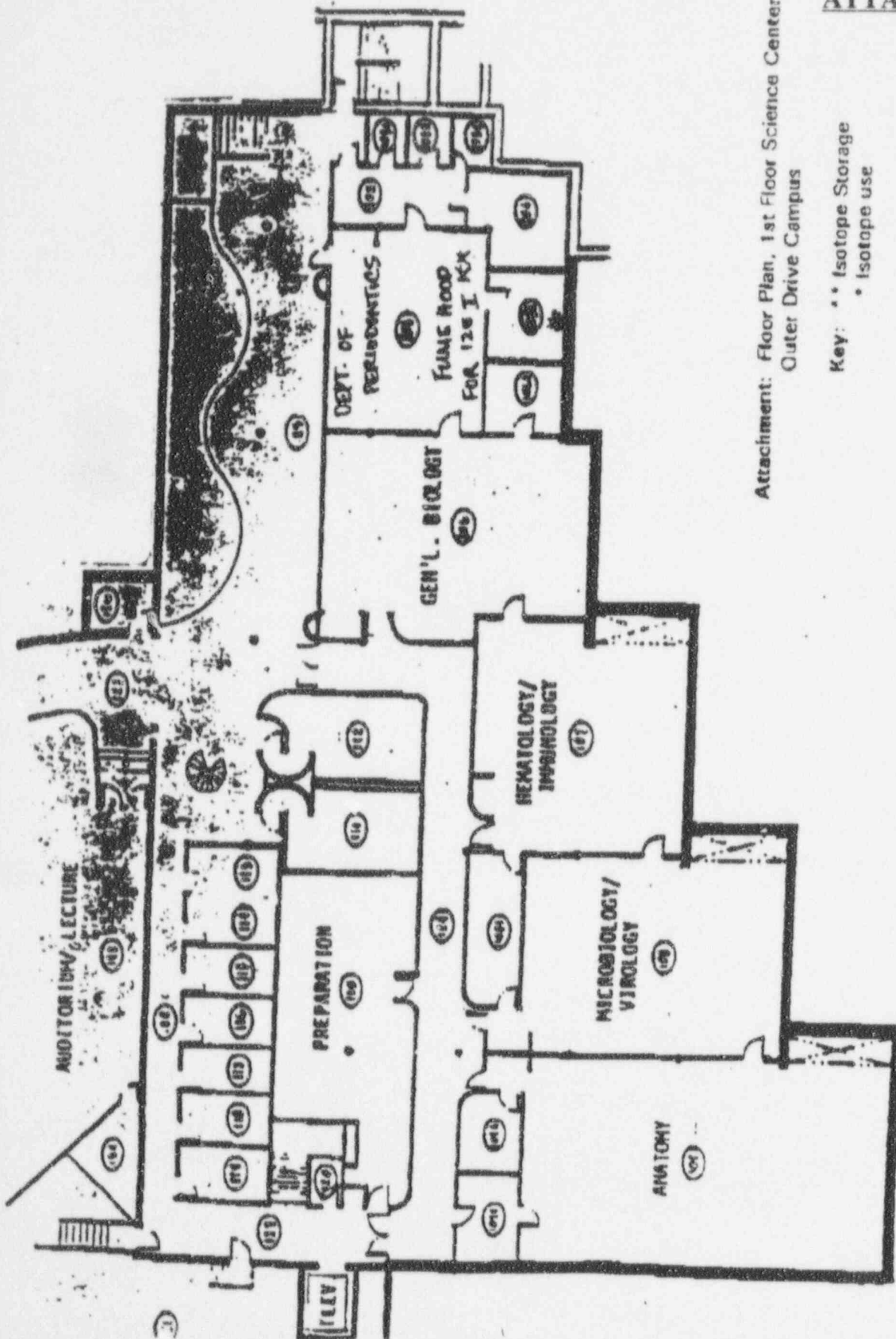
Attachment: Floor Plan, 2nd Floor Science Center
Outer Drive Campus

Key: * Isotope use



SCALE:

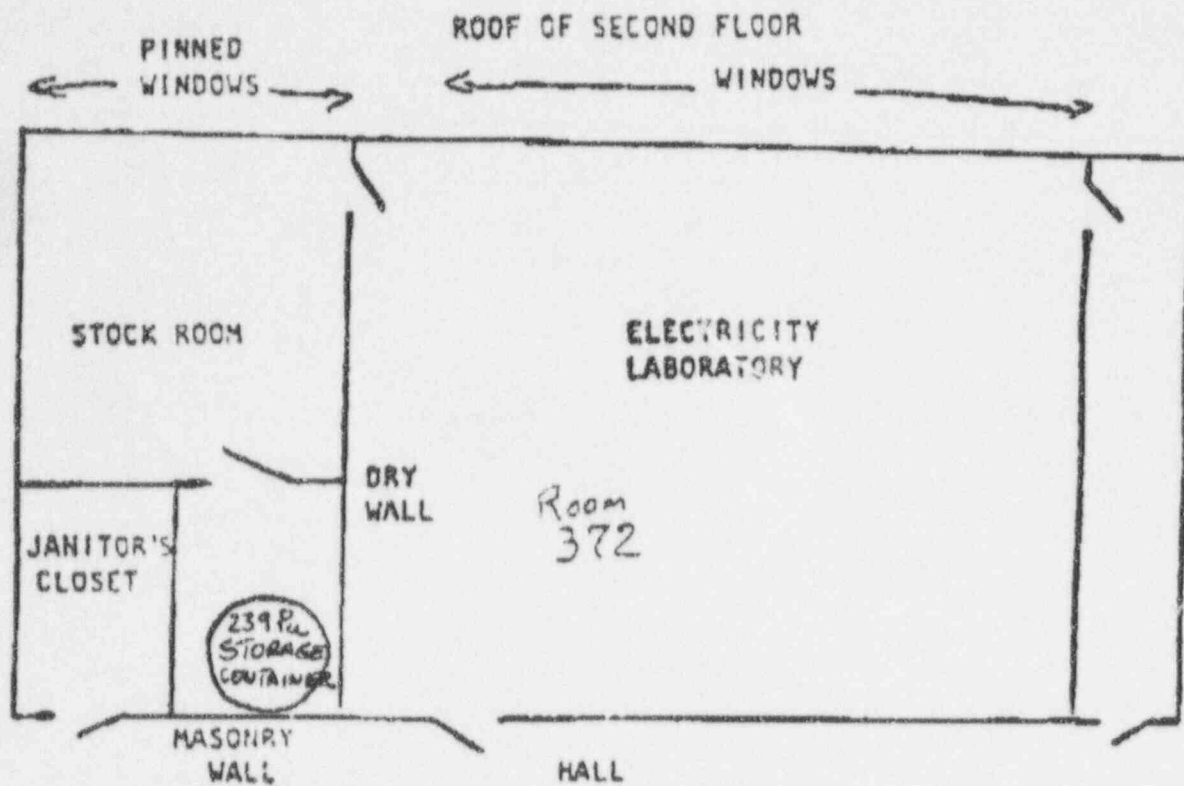




Attachment: Floor Plan, 1st Floor Science Center
Outer Drive Campus

Key: ** Isotope Storage
• Isotope use

ATTACHMENT 6



Attachment: Engineering Building, 3rd Floor Storage,
Area for Plutonium - 239 Source

JUN 11 1996

Maureen A. Fay, O.P., Ph.D.
President
University of Detroit Mercy
P.O. Box 19900
Detroit, MI 48219-0900

Dear Dr. Fay:

We have reviewed your application dated May 26, 1995, for renewal of your NRC License No. 21-00241-09 and find that we will need the following additional information in order to continue our review.

1. Authorized Place of Use

Your current license listed a facility at 2985 East Jefferson Avenue as an authorized place of use. Your renewal application listed a facility at 8200 Outer Drive. Please be advised that we cannot authorize release of the Jefferson Avenue facility for unrestricted use until you perform and provided the results of your closeout surveys which shows the residual radiation levels and the levels of residual removable contamination. Criteria for release of facilities for unrestricted use are included in the **enclosed guide**. Please submit the following additional information:

a. results of surveys made for radiation levels in milliroentgen per hour (Mr/hr) and of wipe test surveys made for removable contamination in disintegrations per minute per 100 square centimeters (dpm/100 cm²), and

b. the manufacturer, model number, sensitivity and the last calibration date of the survey instruments used to perform these measurements.

2. Licensee's Name

It appears from your letter that a possible change of ownership has occurred since the new name of your facility is University of Detroit Mercy School of Dentistry. 10 CFR 30.34(b) requires NRC consent prior to a change of ownership. Please clarify whether a merger, change of ownership, control of licensed activity, etc. has occurred. If so, the 15 questions contained in the enclosed Information Notice 89-25 need to be addressed.

398655

3. Deletion of Radioactive Material

- ✓ Your request for radioactive material is considerably less than what the current license authorizes. Please confirm that for the materials no longer listed in your renewal request, you either never procured the material or that all the material has decayed and been properly disposed.

4. Authorized Users

- ✓ Please clarify what materials you wish Drs. Gleason, Bow and Rowland to be listed for. From our review of their training and experience, Dr. Gleason can be listed for all except Plutonium-239, Dr. Bow can be listed for Plutonium-239 and Carbon-14 and Dr. Rowland can be list for Hydrogen-3 and Iodine-125.

5. Duties of the Radiation Safety Officer (RSO) and Management Control

- a. In the duties of the Radiation Safety Officer, there is a statement that "the RSO will be responsible for a periodic radiation survey of all lab areas employing a radiation source".
? Please define periodic and expand on what type of survey is performed, i.e. wipe test for removable contamination, etc. and clarify whether this is a compliance survey or more of an user audit type survey that would include a review of laboratory records.
- b. There is also a statement that "the RSO may have one or more deputies". Please clarify the intent of this statement and specify the conditions which other individuals will act for the RSO. Normally, other qualified individuals will act for the RSO during absence due to sickness or vacations. The duties of the RSO cannot be alternated to other individuals during normal working conditions when the RSO is available.
✓
- c. 10 CFR 20.1101(c) requires that the licensee review the radiation protection program content and implementation at least annually. Submit a description of your program for performing the required annual review. It should include the following criteria:
- ✓ (1) Senior management oversight of the radiation protection program. Specify the mechanisms that will be used by senior management to ensure that they are aware of NRC regulations, the provisions of the license, and the compliance status of the institution's licensed program.

- (2) Review of the Radiation Safety Officer and staff performance. Specify the minimum qualifications for an individual who will perform this review, and confirm that the results will be reported to senior management.
- (3) Audits by the Radiation Safety Officer and staff to determine user compliance with the requirements of the NRC license and your radiation protection program. Audits should include such topics as: reviews of users' inventory and survey records, evaluation of users' radiation safety procedures through observation and discussion, and performance of independent work area surveys.

6. Training

In your application, you described a training program for ancillary personnel (maintenance, security, etc.) and personnel involved in radionuclide work. Please also confirm that; (1) these personnel will be instructed before assuming duties with, or in the vicinity of licensed materials; (2) will receive annual refresher training; and (3) records of this training will be maintained.

7. Facilities

- a. If licensed materials are to be used in animals, please submit:
 - (1) a description of the animal's housing facilities, and
 - (2) a copy of the instructions provided to animal caretakers for handling of animals, animal waste carcasses, and cleaning and decontamination of animal cages.
- b. Describe the facilities and equipment (e.g., remote handling equipment, storage containers, shielding,) to be made available at each location where licensed material will be used. Please provide a description of the areas assigned for the receipt, storage, preparation, and measurement of licensed materials. Submit a diagram showing the locations of shielding, the proximity of radiation sources to unrestricted areas, and other items related to radiation safety. Diagrams should be drawn to a specified scale, or dimensions should be indicated.
- c. Since you are requesting possession of your Pu-239 source for storage only, please provide a diagram of your storage facility and address posting, security and control of the device. Please also confirm that you will continue to seek proper disposal of the source.

8. Survey Instrument Calibration

Your application for renewal does not address calibration of survey instrumentation and counting equipment. Please describe your instrument calibration procedure and state the frequency. If you intend to contract out the calibration of your instruments, you only need to specify the name of the firm and the license number or submit a copy of the license that authorizes the firm to perform calibration services.

9. Personnel Monitoring

a. Please provide a description of your personnel monitoring program which addresses the following:

- (1) the criteria you will use to determine which groups of workers will be assigned dosimetry,
- (2) types of devices which will be used (e.g., film badges, TLD, body, wrist, ring),
- (3) frequency of exchange, and
- (4) the NVLAP accredited dosimetry processor you will use.

b. In support of your request for more than one millicurie of phosphorus-32, submit special safety instructions to be provided to individuals. Your procedures should include:

- (1) the use of low density shielding (e.g., plexiglass) in order to keep Bremsstrahlung radiation at a minimum,
- (2) a mandatory radiation survey and wipe test for radioactive contamination after each use,
- (3) the use of finger extremity monitors for procedures that involve one millicurie or more,
- (4) a dry run prior to the performance of unfamiliar procedures in order to preclude unexpected complications. In addition, it is recommended that the radiation protection officer be present during new procedures, and
- (5) the use of eye protection for procedures that involve 10 millicuries or more.

10. Bioassays

- ✓
- a. Please describe your bioassay program, including the type of bioassay (thyroid counts, urine counts, whole body counts, etc), the criteria and the frequency for performing bioassays, and the type of action taken when positive results are obtained. It is recommended that bioassay procedures be considered for personnel using millicurie quantities of tritiated organic compounds, iodine-131, and iodine-125 in noncontained forms.
 - b. Your application did not specify the instrument used in your bioassay program for determining activity in the thyroid. Please specify your instrumentation and calibration procedures, including the type of phantom you will use.
 - c. Please specify the criteria used to set the type and frequency at which routine surveys for airborne licensed materials are performed (e.g., breathing zone and general work area air sampling, hood and room ventilation air flow rate measurement, and stack effluent sampling). Describe the instrumentation that will be used for sample collection and analysis, the calibration method and frequency for each, and specify the lower limit of detection and action levels for each.
 - d. In support of your request for more than one millicurie of radioiodine, submit special safety instructions to be provided to individuals. Your procedures should include:
 - (1) A mandatory radiation survey and wipe test for radioactive contamination after each use.
 - (2) Bioassay procedures for individuals working with millicurie quantities of radioiodine.
 - (3) The use of vented hoods for iodination and for the storage of millicurie quantities of radioiodine.
 - (4) A dry run prior to the performance of unfamiliar procedures in order to preclude unexpected complications. In addition, it is recommended that the radiation protection officer be present during new procedures.
 - (5) Procedures for measuring the concentration of radioiodine from the hoods where material is stored and where iodinations are performed.

- e. Your equipment should include a survey instrument with a thin sodium iodide crystal detector probe to detect iodine-125 contamination. Please specify the instrument that will be used for this purpose.

11. Area Monitoring

Please provide a more complete description of the routine survey program, including the areas to be surveyed, the frequency, the types and levels of radiation and contamination considered to be acceptable, and provisions for maintaining records of surveys. The individual user should supplement the surveys performed by the radiation staff. Regularly used laboratories should be surveyed for contamination at the end of each workday and the user needs to maintain records of each survey in units required by 10 CFR Part 20, even if only a single measurement is necessary. Also, please specify the action limits for radiation and contamination surveys and the actions to be taken when these limits are exceeded. The action limits need be in appropriate units.

12. Effluent Monitoring

10 CFR 20.2003(a)(1) requires that a licensee may discharge licensed material into sanitary sewerage if the material is readily soluble (or is readily dispersible biological material). Information Notice 94-07 (enclosed) provides methods for determining compliance with this requirement which are acceptable to the NRC. Please review this Information Notice and provide specific information as to how you will assure that your releases to the sanitary sewerage system will meet the solubility criteria in 10 CFR 20.2003(a)(1). If you wish, you may indicate that you will use one of the methods described in Information Notice 94-07. Otherwise, describe your alternative methodology including the models, calculations, analytical techniques, and quality control measurements as well as the records that will be maintained.

13. Material Control and Inventory

- a. Please describe your licensed material inventory, control and accountability program. Your inventory and control system should have the capability to assure that licensed material possession limits are not exceeded and that material is accountable throughout the institution at any given time.
- b. Please provide your procedures for transfer and transportation of licensed material between authorized users at your facility, and your procedures for transfer and transportation of licensed material to other licensees. Describe your program to control such transfers, including update of material inventory and audits of users' procedures.

14. Records

✓ Please confirm that you will maintain records of the following activities:

- a. Radiation safety training, including initial and retraining, list of topics covered, the amount of time spent, the date(s), and the instructor(s) and student(s) names.
- b. Radiation Safety Committee meeting minutes, including review and approval of authorized users and uses of licensed material.
- c. Results of audits performed by the Radiation Safety Committee.
- d. Results of audits and surveys performed by the Radiation Safety Officer and staff.
- e. Decay-in-storage waste records, including the date licensed material is placed into storage, and the date and results of surveys performed when disposed.
- f. Receipt and transfer of licensed material.
- g. Licensed material inventory.
- h. Calibration of radiation monitoring instruments and equipment.

15. General Laboratory Safety Instructions

✓ Your laboratory safety instructions listed on page 7 often uses the word "should" which indicates an option to perform the task or not perform the task. To assure good health physics practices, please confirm that your laboratory instructions will require, at a minimum, the following:

- a. Wear laboratory coats or other protective clothing at all times in areas where licensed materials are used.
- b. Wear disposable gloves at all times while handling licensed materials.
- c. Either after each procedure or before leaving the area, monitor your hands for contamination in low-background area.
- d. Do not eat, drink, smoke or apply cosmetics in any area where licensed material is stored or used.
- e. Do not store food, drink or personnel effects in areas where licensed material is stored or used.

- f. Wear required personnel monitoring devices at all times while in areas where licensed materials are used or stored.
- g. Dispose of radioactive waste only in designated, labeled and properly shielded receptacles.
- h. Never pipette by mouth.
- i. Confine radioactive solutions in clearly labeled containers.
- j. Secure all licensed material when not under the constant surveillance and immediate control of the authorized users.

16. Waste Disposal

- a. Please provide your procedures for disposal of licensed radioactive waste by decay-in-storage. Your procedures must provide assurance that you will:
 - (1) hold the radioactive waste in storage for at least 10 half-lives,
 - (2) survey the waste in a low background area with a low-level survey meter with all the shielding removed,
 - (3) not dispose of the waste as normal trash unless the radiation level is at background,
 - (4) remove or deface the radioactive material labels or otherwise indicate that containers no longer hold radioactive materials, and
 - (5) you will maintain records of these waste disposal surveys.

"Guidance to Licensees Regarding Requests to Dispose of Radioactive Waste by Decay-In-Storage" (enclosed) may be helpful in preparing your response.
- b. ✓ Your procedures for waste disposal references outdated regulations in the old 10 CFR Part 20. The regulations in 10 CFR Part 20 were revised on January 1, 1994. Please review the new 10 CFR Part 20 (**enclosed**) and reference the appropriate parts of the new Part 20.

We will continue our review of your application upon receipt of this information. Please reply in duplicate, within 20 days, and refer to Control Number 398655.

M. Fay

-9-

If you have any questions or require clarification on any of the information stated herein, you may contact me at (708) 829-9873.

Sincerely,

Original Signed By
James R. Mullauer, M.H.S.
Health Physicist
Nuclear Materials Licensing Branch

License No. 21-00241-09
Docket No. 030-14288

DOCUMENT NAME: M:\03014288.DF6

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DATE	06/10/96								

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June 5, 1995

University of Detroit
School of Dentistry
ATTN: Leo H. Blackwell, Ph.D.
Radiation Safety Officer
P.O. Box 19900
Detroit, MI 48219-0900

SUBJECT: LICENSE RENEWAL APPLICATION

Dear Dr. Blackwell:

This is to acknowledge receipt of your application for renewal of the material(s) license identified above. Your application is deemed timely filed, and accordingly, the license will not expire until final action has been taken by this office.

Any correspondence regarding the renewal application should reference the control number specified and your license number.

Sincerely,

Original Signed By
Marianne Meenan, Chief
Nuclear Materials Support Section

License No. 21-00241-09
Control No. 398655

DOCUMENT NAME: M:\03014288.DT5

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School of Dentistry

May 15, 1996

Marianne Meenan, Chief
Nuclear Materials Support Section Region III
United States Nuclear Regulatory Commission
801 Warrenville Road
Lisle, IL 60532-4351

Re: License No. 21-00241-09
Control No. 398655

Dear Ms. Meenan:

I received a card and then your letter of June 5, 1995 indicating that the license noted above was filed in a timely fashion and that this license would not expire until final action was taken.

The renewal application filed was drafted to reflect our current program and includes a planned move of the programs currently at the Dental campus to another campus of the University along with my intention to pass the duties of Radiation Safety Officer on to a younger colleague.

We have had no problem operating under the conditions of license No. 21-00241-09, however the move of the Dental program is scheduled for August of 1997. It would be helpful if you could advise us about the status of our renewal application as we have ample time in the ensuing year to address any problems your review of this application may reveal.

Thank you.

Sincerely,

Leo H. Blackwell, Ph.D.
Radiation Safety Officer

RECEIVED

MAY 20 1996

REGION III

cc: Brad Fitch, Chairman
Radiation Safety Committee

MAY 20 1996

2985 E. Jefferson Avenue
Detroit, Michigan 48207-4282
313-446-1800