FRANKLIN & MARSHALL

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December 22, 2005

Licensing Assistance Team
Division of Nuclear Materials Safety
U.S. Nuclear Regulatory Commission, Region I
475 Allendale Road
King of Prussia, PA 19406-1415

03017052

Dear Sirs or Madams:

Enclosed is our application for renewal of our material license #37-11185-04.

Note that we are reverting to Dr. Linda Fritz as RSO, since she is now back from sabbatical, and "demoting" me to Assistant RSO.

Thank you for your attention.

Sincerely,

Ned S. Dixon

Dr. Ned S. Dixon, RSO
Research Associate and Visiting Assistant Professor

Contact information:

Dr. Fritz	(717) 291-3813 linda.fritz@fandm.edu
Dr. Dixon	(717) 358-4591 ned.dixon@fandm.edu

138143

DEPARTMENT OF PHYSICS AND ASTRONOMY FRANKLIN & MARSHALL COLLEGE P.O. BOX 3003 LANCASTER, PENNSYLVANIA USA 17604-3003
TELEPHONE: 717.291.4136 FAX: 717.358.4474

NMSS/RGN1 MATERIALS-002

NRC FORM 313 (10-2005) 10 CFR 30, 32, 33, 34, 35, 36, 39, and 40

U.S. NUCLEAR REGULATORY COMMISSION

APPLICATION FOR MATERIAL LICENSE

APPROVED BY OMB: NO. 3150-0120 EXPIRES: 10/31/2008

Estimated burden per response to comply with this mandatory collection request: 4.4 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. Send comments regarding burden estimate to the Records and FOIA/Privacy Services Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0120), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

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:

ALABAMA, CONNECTICUT, DELAWARE, DISTRICT OF COLUMBIA, FLORIDA, GEORGIA, KENTUCKY, MAINE, MARYLAND, MASSACHUSETTS, MISSISSIPPI, NEW HAMPSHIRE, NEW JERSEY, NEW YORK, NORTH CAROLINA, PENNSYLVANIA, PUERTO RICO, RHODE ISLAND, SOUTH CAROLINA, TENNESSEE, VERMONT, VIRGINIA, VIRGIN ISLANDS, OR WEST VIRGINIA, SEND APPLICATIONS TO:

LICENSING ASSISTANCE TEAM
DIVISION OF NUCLEAR MATERIALS SAFETY
U.S. NUCLEAR REGULATORY COMMISSION, REGION I
475 ALLENDALE ROAD
KING OF PRUSSIA, PA 19406-1415

IF YOU ARE LOCATED IN:

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

MATERIALS LICENSING BRANCH
U.S. NUCLEAR REGULATORY COMMISSION, REGION III
2443 WARRENVILLE ROAD, SUITE 210
LISLE, IL 60532-4352

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 BRANCH
U.S. NUCLEAR REGULATORY COMMISSION, REGION IV
611 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TX 76011-4005

03017052

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
   - [X] C. RENEWAL OF LICENSE NUMBER 37-11185-04

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

   Franklin & Marshall College
   P. O. Box 3003
   Lancaster, PA 17604-3003

3. ADDRESS WHERE LICENSED MATERIAL WILL BE USED OR POSSESSED

   Franklin & Marshall College
   Main campus, off Harrisburg Pike
   Lancaster, PA 17603

4. NAME OF PERSON TO BE CONTACTED ABOUT THIS APPLICATION

   Dr. Linda S. Fritz

   TELEPHONE NUMBER

   717-291-3813

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. LICENSE FEES *(See 10 CFR 170 and Section 170.31)*

    FEE CATEGORY exempt | AMOUNT ENCLOSED $ 0.00

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	SIGNATURE	DATE
Thomas J. Kingston Jr, Vice President/Finance&Admin	Thomas J. Kingston	12/21/05

FOR NRC USE ONLY

TYPE OF FEE	FEE LOG	FEE CATEGORY	AMOUNT RECEIVED	CHECK NUMBER	COMMENTS
			$		

APPROVED BY | DATE

138148

APPLICATION ITEM #5 (LICENSE ITEMS #6, #7, AND #8): RADIOACTIVE MATERIAL, ITEMS H THROUGH M POSSESSION ONLY

a. Element and mass number.	b. Chemical and/or physical form.	c. Maximum amount which will be possessed at any one time.
A. Any byproduct material with Atomic Nos. 3 through 83 inclusive with half-lives of less than 120 days.	A. Any.	A. 1 millicurie of each radionuclide; not more than 40 millicuries total.
B. Any byproduct material with Atomic Nos. 3 through 83 inclusive with half-lives greater than 120 days.	B. Any.	B. 20 microcuries of each radionuclide; not more than 200 microcuries total.
C. Hydrogen-3.	C. Any.	C. 10 millicuries.
D. Carbon-14.	D. Any.	D. 10 millicuries.
E. Phosphorus-32.	E. Any.	E. 2 millicuries.
F. Sulfur-35.	F. Any.	F. 10 millicuries.
G. Calcium-45.	G. Any.	G. 2 millicuries.
H. Cobalt-60	H. Sealed sources.	H. 10 millicuries.
I. Erbium-169.	I. Metallic foil.	I. 350 millicuries per source; not more than 700 millicuries total.
J. Thulium-170.	J. Metallic foil.	J. 2 millicuries.
K. Polonium-210.	K. Any.	K. 100 microcuries.
L. Plutonium-239.	L. Any.	L. 1 microcurie.
M. Plutonium-239	M. Plated sources	M. 10 nanocuries

In addition to the above possession limits, possession of unsealed byproduct material of half-life greater than 120 days shall be restricted in the following manner: If only one such isotope is possessed, the quantity possessed shall be less than or equal to 10,000 times the applicable quantity in Appendix C to 10 CFR 20. For a combination of such isotopes, R, defined as the sum of the ratios of the quantity of each isotope possessed to the applicable quantity in Appendix C to 10 CFR 20, divided by 10,000 shall be less than or equal to one.

ITEM #6: PURPOSES FOR WHICH LICENSED MATERIAL WILL BE USED

Research and development as defined in 10 CFR 30.4 (including animal tissue and plant studies); teaching and training of students. Iodination procedures will not be performed. (See also Item #9.)

ITEM #7: INDIVIDUALS RESPONSIBLE FOR RADIATION SAFETY PROGRAM AND THEIR TRAINING AND EXPERIENCE

Dr. Linda S. Fritz, RSO and Professor, Department of Physics and Astronomy.

TRAINING:

TYPE OF TRAINING	WHERE TRAINED	DURATION OF TRAINING	ON THE JOB / FORMAL TRAINING?
A. PRINCIPLES AND PRACTICES OF RADIATION PROTECTION	1: Stanford University 2: Stanford University 3: Northeastern University 4: Franklin & Marshall College 5: Radiation Safety Associates, Inc.	1: 6 years 2: 2 weeks 3: 3 years 4: 21 years 5: 1 week	1: On the job 2: Formal training 3: On the job 4: On the job 5: Formal training
B. RADIOACTIVITY MEASUREMENT STANDARDIZATION & MONITORING TECHNIQUES AND INSTRUMENTS	1: Stanford University 2: Stanford University 3: Northeastern University 4: Franklin & Marshall College 5: Radiation Safety Associates, Inc.	1: 6 years 2: 2 weeks 3: 3 years 4: 21 years 5: 1 week	1: On the job 2: Formal training 3: On the job 4: On the job 5: Formal training

C. MATHEMATICS AND CALCULATIONS BASIC TO THE USE AND MEASUREMENT OF RADIOACTIVITY	1: Stanford University 2: Stanford University 3: Northeastern University 4: Franklin & Marshall College 5: Radiation Safety Associates, Inc.	1: 6 years 2: 2 weeks 3: 3 years 4: 21 years 5: 1 week	1: On the job 2: Formal training 3: On the job 4: On the job 5: Formal training
D. BIOLOGICAL EFFECTS OF RADIATION	1: Stanford University 2: Stanford University 3: Northeastern University 4: Franklin & Marshall College 5: Radiation Safety Associates, Inc.	1: 6 years 2: 2 weeks 3: 3 years 4: 21 years 5: 1 week	1: On the job 2: Formal training 3: On the job 4: On the job 5: Formal training

EXPERIENCE WITH RADIATION:

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
Co-57	20 mCi	1: Stanford University 2: Northeastern University 3: Franklin & Marshall College	1: 6 years 2: 3 years 3: 11 years	Mössbauer effect
Er-169	350 mCi	1: Stanford University 2: Northeastern University 3: Franklin & Marshall College	1: 6 years 2: 3 years 3: 21 years	Mössbauer effect
Tm-170	300 mCi	Stanford University	6 years	Mössbauer effect

2. Dr. Ned S. Dixon, Assistant RSO, Research Associate and Visiting Assistant Professor, Department of Physics and Astronomy.

TRAINING:

TYPE OF TRAINING	WHERE TRAINED	DURATION OF TRAINING	ON THE JOB / FORMAL TRAINING?
A. PRINCIPLES AND PRACTICES OF RADIATION PROTECTION	1: Stanford University 2: Stanford University 3: Northeastern University 4: Franklin & Marshall College	1: 8 years 2: 2 weeks 3: 3 years 4: 21 years	1: On the job 2: Formal training 3: On the job 4: On the job
B. RADIOACTIVITY MEASUREMENT STANDARDIZATION & MONITORING TECHNIQUES AND INSTRUMENTS	1: Stanford University 2: Stanford University 3: Northeastern University 4: Franklin & Marshall College	1: 8 years 2: 2 weeks 3: 3 years 4: 21 years	1: On the job 2: Formal training 3: On the job 4: On the job
C. MATHEMATICS AND CALCULATIONS BASIC TO THE USE AND MEASUREMENT OF RADIOACTIVITY	1: Stanford University 2: Stanford University 3: Northeastern University 4: Franklin & Marshall College	1: 8 years 2: 2 weeks 3: 3 years 4: 21 years	1: On the job 2: Formal training 3: On the job 4: On the job
D. BIOLOGICAL EFFECTS OF RADIATION	1: Stanford University 2: Stanford University 3: Northeastern University 4: Franklin & Marshall College	1: 8 years 2: 2 weeks 3: 3 years 4: 21 years	1: On the job 2: Formal training 3: On the job 4: On the job

EXPERIENCE WITH RADIATION:

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
Co-57	20 mCi	1: Stanford University 2: Northeastern University 3: Franklin & Marshall College	1: 8 years 2: 3 years 3: 11 years	Mössbauer effect
Er-169	350 mCi	1: Stanford University 2: Northeastern University 3: Franklin & Marshall College	1: 8 years 2: 3 years 3: 21 years	Mössbauer effect
Tm-170	300 mCi	Stanford University	8 years	Mössbauer effect

ITEM #8: TRAINING FOR INDIVIDUALS WORKING IN OR FREQUENTING RESTRICTED AREAS

A. Persons authorized to supervise the use of radioactive material or use material without supervision:

1. Dr. Linda S. Fritz (see above).

2. Dr. Ned S. Dixon (see above).
3. Dr. Meredith J. Bashaw, Assistant Professor, Department of Psychology

TRAINING:

TYPE OF TRAINING	WHERE TRAINED	DURATION OF TRAINING	ON THE JOB / FORMAL TRAINING?
A. PRINCIPLES AND PRACTICES OF RADIATION PROTECTION	Department of Conservation and Research for Endangered Species (CRES), Zoological Society of San Diego	2.5 years	On the job and Formal

B. RADIOACTIVITY MEASUREMENT STANDARDIZATION & MONITORING TECHNIQUES AND INSTRUMENTS	CRES, Zoological Society of San Diego	2.5 years	On the job and Formal
C. MATHEMATICS AND CALCULATIONS BASIC TO THE USE AND MEASUREMENT OF RADIOACTIVITY	CRES, Zoological Society of San Diego	2.5 years	On the job
D. BIOLOGICAL EFFECTS OF RADIATION	CRES, Zoological Society of San Diego	2.5 years	On the job and Formal

EXPERIENCE WITH RADIATION:

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
H-3	5 mCi	CRES, Zoological Society of San Diego	2.5 years	Biological research
I-125	1 mCi	CRES, Zoological Society of San Diego	2.5 years	Biological research

4. Dr. Carl S. Pike, Professor, Department of Biology.

TRAINING:

TYPE OF TRAINING	WHERE TRAINED	DURATION OF TRAINING	ON THE JOB / FORMAL TRAINING?
A. PRINCIPLES AND PRACTICES OF RADIATION PROTECTION	Franklin & Marshall College	35 years	On the job

B. RADIOACTIVITY MEASUREMENT STANDARDIZATIO N & MONITORING TECHNIQUES AND INSTRUMENTS	Franklin & Marshall College	35 years	On the job
C. MATHEMATICS AND CALCULATIONS BASIC TO THE USE AND MEASUREMENT OF RADIOACTIVITY	Franklin & Marshall College	35 years	On the job
D. BIOLOGICAL EFFECTS OF RADIATION	Franklin & Marshall College	35 years	On the job

EXPERIENCE WITH RADIATION:

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
H-3	1 mCi	Franklin & Marshall College	35 years	biochemical research & teaching
C-14	1 mCi	Franklin & Marshall College	35 years	biochemical research & teaching
P-32	1 mCi	Franklin & Marshall College	35 years	biochemical research & teaching
S-35	0.25 mCi	Franklin & Marshall College	24 years	biochemical research & teaching

B. Other faculty who supervise use of radioactive materials in course work or as research advisors will be certified to do so by the RSO or Assistant RSO, by demonstrating a competent understanding of radiation safety, practices, and procedures.

C. Students who use radioactive materials under the supervision of a research advisor will be instructed in the proper safety, practices, and procedures of such work by their research advisors, and will be certified to do so by an exam administered by the RSO or her designee.

D. Students who use radioactive materials under the direct supervision of a classroom instructor in a classroom laboratory setting will be instructed in radiation safety and procedures pertinent to the laboratory exercise in question by the classroom instructor.

E. Ancillary personnel are not required nor allowed to work in areas where radioactive materials are available to them or radiation levels are above those allowed for the general public. In particular, housekeeping personnel enter rooms where radioactive materials are used only in the evening, after all sources have been returned to secure and shielded storage or disposed of and surveys of the areas have been performed. Campus Security personnel who have access to the special keys for rooms P-19 and P-224 (See Item #9 below) enter these rooms only after contacting the RSO or Assistant RSO, and are instructed annually in this procedure.

ITEM #9: FACILITIES AND EQUIPMENT

Radioactive material is used only in two buildings, the Hackman Physical Science Laboratories in the Pfeiffer Science Complex (The name of the building was changed after renovation.) (Department of Physics and Astronomy) and Fackenthal Laboratories (Department of Biology), on the main campus off Harrisburg Pike at College Avenue.

A. THE HACKMAN PHYSICAL SCIENCES LABORATORIES IN THE PFEIFFER SCIENCE COMPLEX

Room P-19: Storage room. (See Attachment #1 for a sketch approximately to scale.) This basement room is used for long-term storage of unused radioactive material and to hold material for decay-in-storage. Keys to this room are held only by the RSO and Campus Security.

Room P-216: Modern Physics laboratory. (See Attachment #2.)

This instructional laboratory is used for the Modern Physics course. Microcurie or smaller (exempt quantity) sources only are used by students, and are surrounded by lead brick housings when in use. Tweezers are available for handling the sources. The sources for use here are stored in a locked chest. No radiation above background is detected outside the chest. Sources are returned to this chest at the end of any lab period of use. The keys to this chest are held by the RSO only.

Room P-224: Faculty Mössbauer research lab. (See Attachment #3.)
This lab is used for Mössbauer effect studies using Er-169 and Co-57 (not licensed through NRC). Lead bricks and leaded glass are in place for shielding, and vinyl gloves and tweezers are available for handling sources. Unpacking of sources and wipe testing for contamination will be done here. Mounting of a source on the Mössbauer drive motor will be done here. Sources are mounted to the drive motor inside a closed brass "cap" with a Be end window. A locked cabinet is available for short-term storage of radioactive materials. Lead "pigs" and bricks provide shielding. The key to the cabinet lock is held by the RSO. The source(s) will be used only within concrete block and lead brick "pits", one for room temperature work, one surrounding the tail section of a 4 K closed-cycle refrigerator, and another surrounding the tail section of a 50 mK ^{3}He-^{4}He dilution refrigerator. These arrangements have been used with 300 mCi Er-169 sources, with external exposure rates limited to less than 0.1 mR/hr and generally (most locations) indistinguishable from background. This room is kept locked at all times when sources are present but research personnel are not present.

B. FACKENTHAL LABORATORIES.

Room F-214: Instructional laboratory. (See Attachment #4.)
This room is used for classroom laboratories using radioactive materials. Microcurie or less levels of materials only are used by students. Experiments are done on trays with absorbent paper. All pipetting is done mechanically, and lab coats and disposable gloves are worn at all times. No radioactive materials are left out at the end of the laboratory period.

Rooms F-304, -306: Faculty research laboratories. (See Attachments # 5 & 6.)
These rooms are used by faculty and students for research projects. Experiments are done on trays with absorbent paper. All pipetting is done mechanically and lab coats and disposable gloves are worn whenever radioactive material is used. The activity used in these rooms is perhaps up to 100 microcuries. Research includes nucleotide sequence analysis using P-32 labeled nucleotide precursors, research on protein kinase enzymes using P-32 labeled ATP in plants, and research on thyroid hormone receptors using I-125 labeled materials in muscle tissue (no whole animal studies are done).

ITEM #10: RADIATION PROTECTION PROGRAM

General statement: Franklin & Marshall College will operate its program of use of radioactive materials in accordance with all applicable regulations contained in 10 CFR Parts 19, 20, 30, 33, and 70 and will do so, to the extent practicable, in such a fashion as to achieve occupational doses and doses to members of the general public that are as low as is reasonably achievable (ALARA).

10.2 RADIATION MONITORING INSTRUMENTS

We will use instruments that meet the radiation monitoring instrument specifications published in Appendix M to NUREG – 1556, Vol.7 "Program-Specific Guidance About Academic, Research and Development, and Other Laboratory Licenses of Limited Scope", dated December 1999. We reserve the right to upgrade our survey instruments as necessary.

	TYPE	NUMBER	RADIATION	SENSITIVITY	WINDOW THICKNESS	USE
# 1	Dosimeter Corporation Model 3007 GM tube survey meter	3	alpha beta gamma	0-50 mR/hr	1 mg/cm^2	Survey
# 2	Nuclear Chicago GM tubes with The Nucleus Model 500/550 scalars	2	alpha beta gamma		2 mg/cm^2	Wipe tests

CALIBRATION OF INSTRUMENTS

The survey meters will be sent out one at a time for commercial calibrations annually to

EDO Artisan, Inc.
5 Eastmans Road
Parsippany, NJ 07054
(973) 887-7100,

or other accredited calibration services.

The wipe-test equipment will be calibrated annually using an approximate 2π geometry with a Cs-137 source from U.S. Nuclear specified as having 5.62×10^6 dpm as of October 12, 1962.

FILM BADGES

Although no badges are required pursuant to 10 CFR 20.1502 because of the small quantities of radioactive material generally used and the record of past film badge usage with no significant exposures recorded such that no person is

expected to receive anything close to 10% of the applicable annual limit, nonetheless, film badges and finger rings will be worn by Dr. Fritz or Dr. Dixon when handling the Er-169/Tm-170 sources, and are monitored monthly and supplied by

Landauer, Inc.
2 Science Road
Glenwood, Illinois 60425-1586
(708) 755-7000,

or other accredited dosimetry services. Some other personnel may be issued badges from time to time as a general check on the radiation protection program.

10.3 MATERIAL RECEIPT AND ACCOUNTABILITY

Receipt:

1. All radioactive materials will normally be delivered to the Receiving Department at

Franklin & Marshall College
Warehouse
501 Harrisburg Pike
Lancaster, PA 17604-3003

That department will inspect the package for any signs of damage or wetness, and notify the RSO immediately of any such conditions. It will also notify the RSO if there is any delay in delivering the package to Pfeiffer (Hackman) or Fackenthal, and store it in a secure place until delivered. Shipments received outside of the normal Receiving hours (currently 8:00 AM - 12:00 noon, Monday through Friday) will be delivered to the Security Office (open 24 hours/day, 365 days/year). Security will notify the RSO immediately, and otherwise follow the same procedures as Receiving.

2. Incoming packages will normally be wipe-tested and opened in Room P-224 or wipe-tested at the Warehouse or Security if there are any signs of damage or wetness, by the RSO, the Assistant RSO, or their designee.

Accountability:

Physical inventories will be conducted at intervals not to exceed six months, to account for all sealed sources and devices received and possessed under the license.

10.4 OCCUPATIONAL DOSE

We have done a perspective evaluation and determined that unmonitored individuals are not likely to receive, in one year, a radiation dose in excess of 10% of the allowable limits in 10 CFR part 20.

10.6 SAFE USE OF RADIONUCLIDES AND EMERGENCY PROCEDURES

Procedures for safe use and emergency response have been developed.

10.7 SURVEYS, WIPE-TESTS, AND LEAK-TESTS:
Because of the occasional nature of use of radioactive materials, general surveys of each area of use will be made after each such use. Specifically, for the Er-169/Tm-170 sources, each time a source is moved, the area or enclosure from which it came will be wipe-tested for contamination.

Leak tests of sealed sources will be performed by wipe-testing the outside of the source encapsulation or the inside of the container holding the source, as appropriate.

Such wipe-tests, as well as wipe-tests on arrival of radioactive materials, will be done by the RSO, the Assistant RSO, or their designee using approximately one square inch pieces of filter paper and instrument #2 of Item #10.2. Wipes will be counted for one minute. With background also counted for one minute, and a typical background rate of 40 cpm, the minimum detectable count rate at the 95% confidence level is 29 cpm $\left[MDCR = 2(1.645)\sqrt{\frac{R_b}{t_b} + \frac{R_b}{t_s}} = 4.65\sqrt{R_b}\right]$. For overall counter efficiencies of 1% (with the counter at 1 inch distance from the wipe), this then gives a minimum detectable activity of approximately 0.001 mCi.

ITEM #11: WASTE MANAGEMENT

Most, if not all, radioactive waste is generated in the Biology Department, which maintains a radioactive waste accumulation record and flow chart.

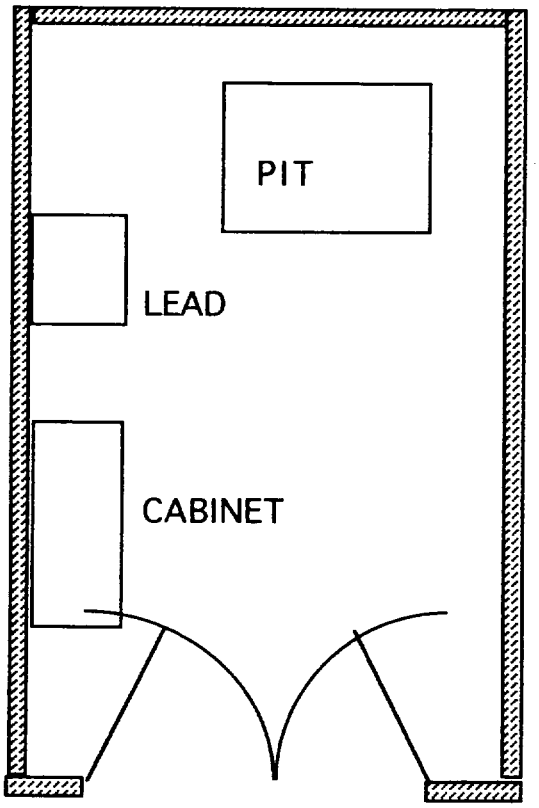
When possible, radioactive waste will be released into sanitary sewerage in accordance with 10 CFR 20.2003(a). The Biology building (Fackenthal Laboratories) plumbing empties into sewer lines whose flow rate is approximately 100,000 gallons per month.

When appropriate, radioactive material with a physical half-life of less than 90 days [to include S-35 with a half-life of 88 days] will be held in either room F-12 or P-19 for decay-in-storage before disposal in ordinary trash under the following conditions: A. Radioactive waste to be disposed of in this manner will be held for decay a minimum of 10 half-lives. B. Before disposal as normal waste, the radioactive waste will be surveyed to determine that its radioactivity cannot be distinguished from background, and all radiation labels will be removed or obliterated.

Other radioactive waste will be held in storage in either room P-19, until it can be disposed of by:

Ecology Services, Inc.
10220 Old Columbia Road
Columbia, MD 21046
(800) 932-7299

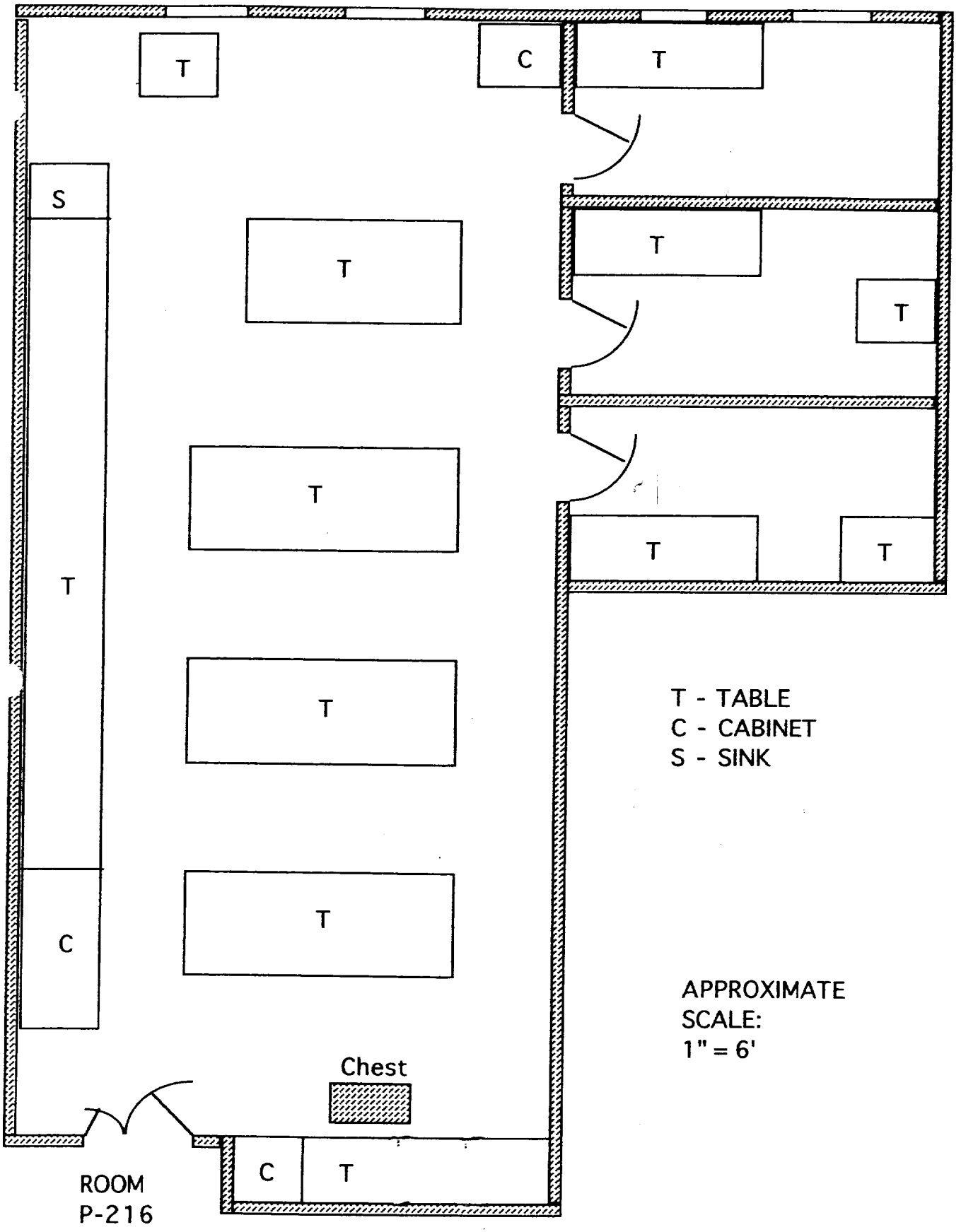
or other licensed radioactive waste handlers.



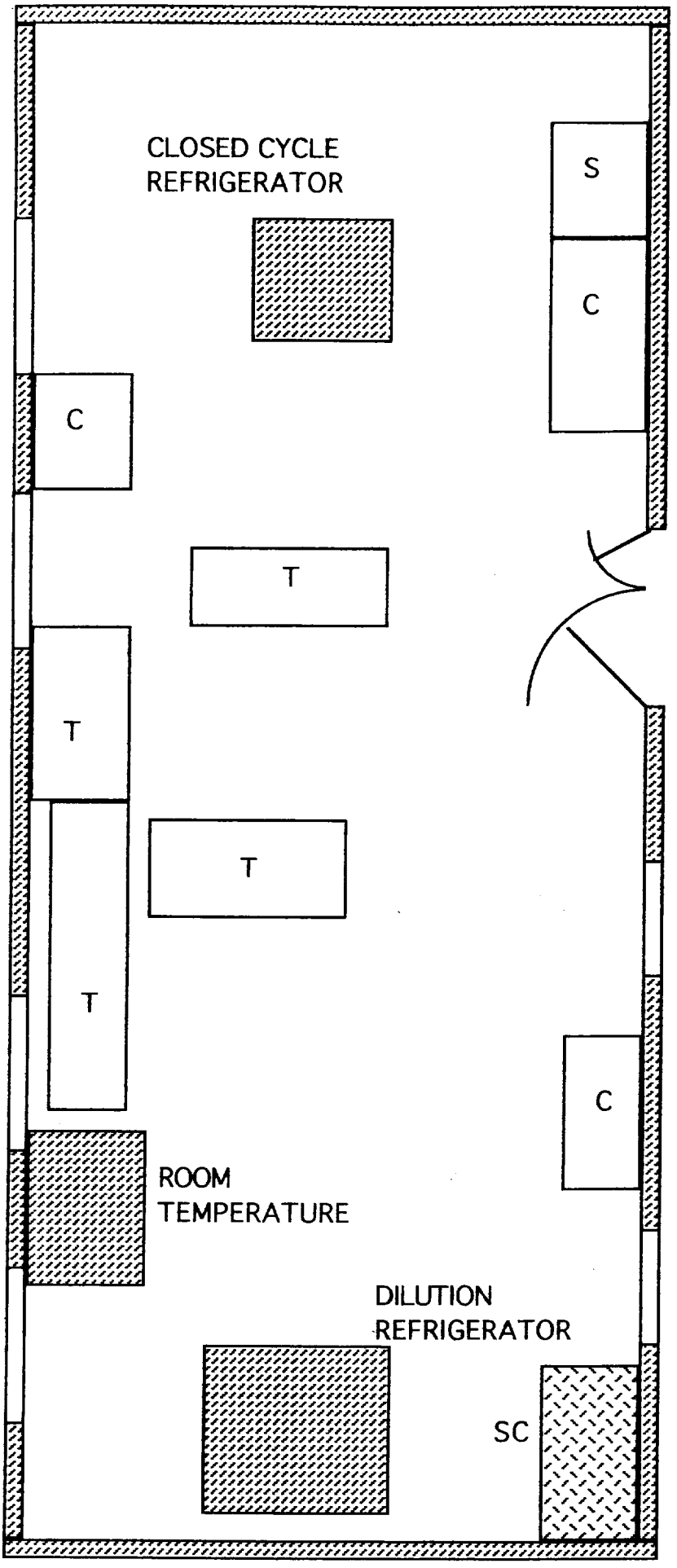
ROOM P-19

APPROXIMATE
SCALE:
1" = 3'

ATTACHMENT #2



ATTACHMENT #3



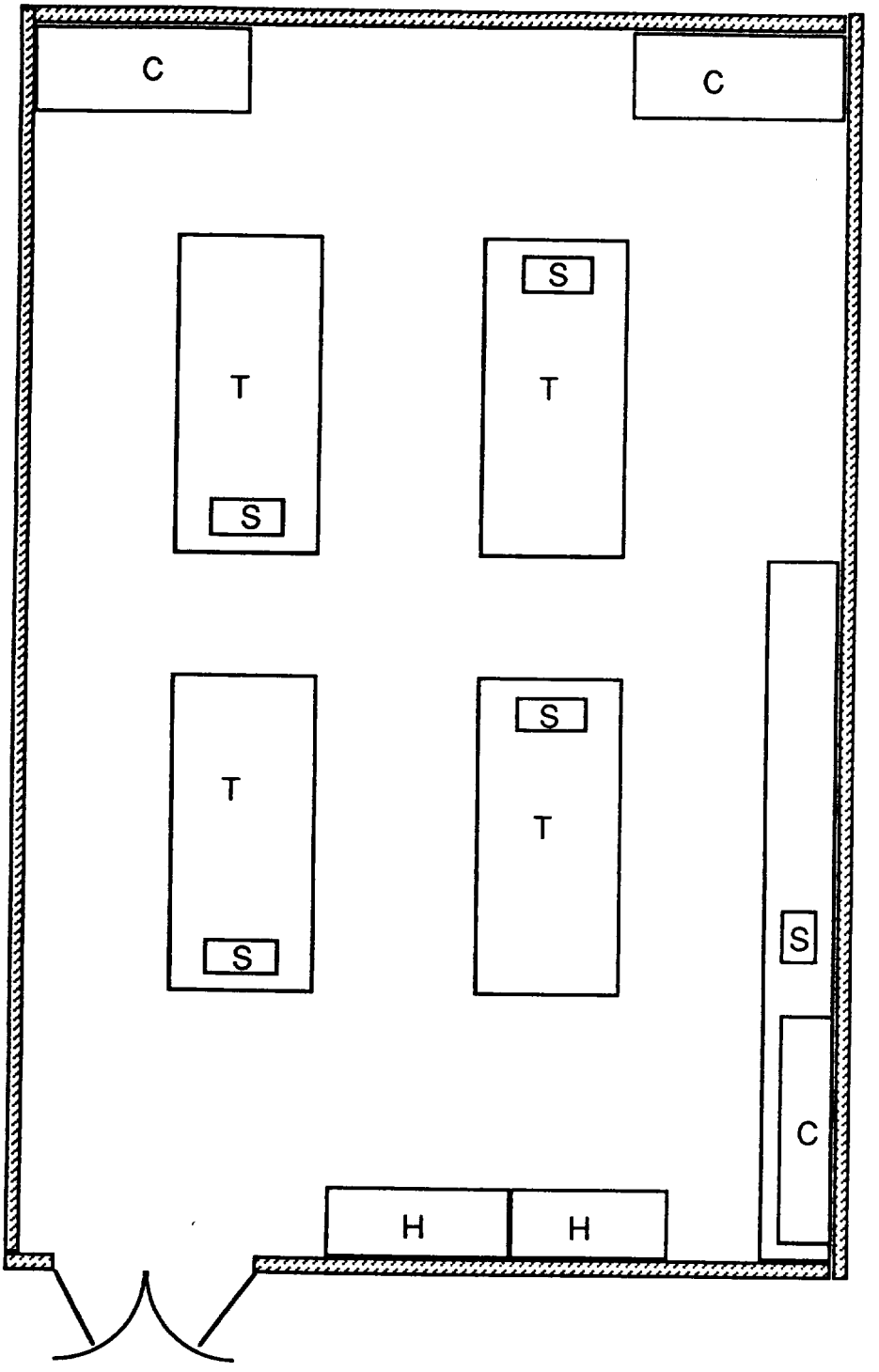
Explanation
of symbols

experimental set-up where radioactive material is used

S- sink
C- built-in cabinet
SC- storage cabinet
T- table

scale
1 inch = 4 feet

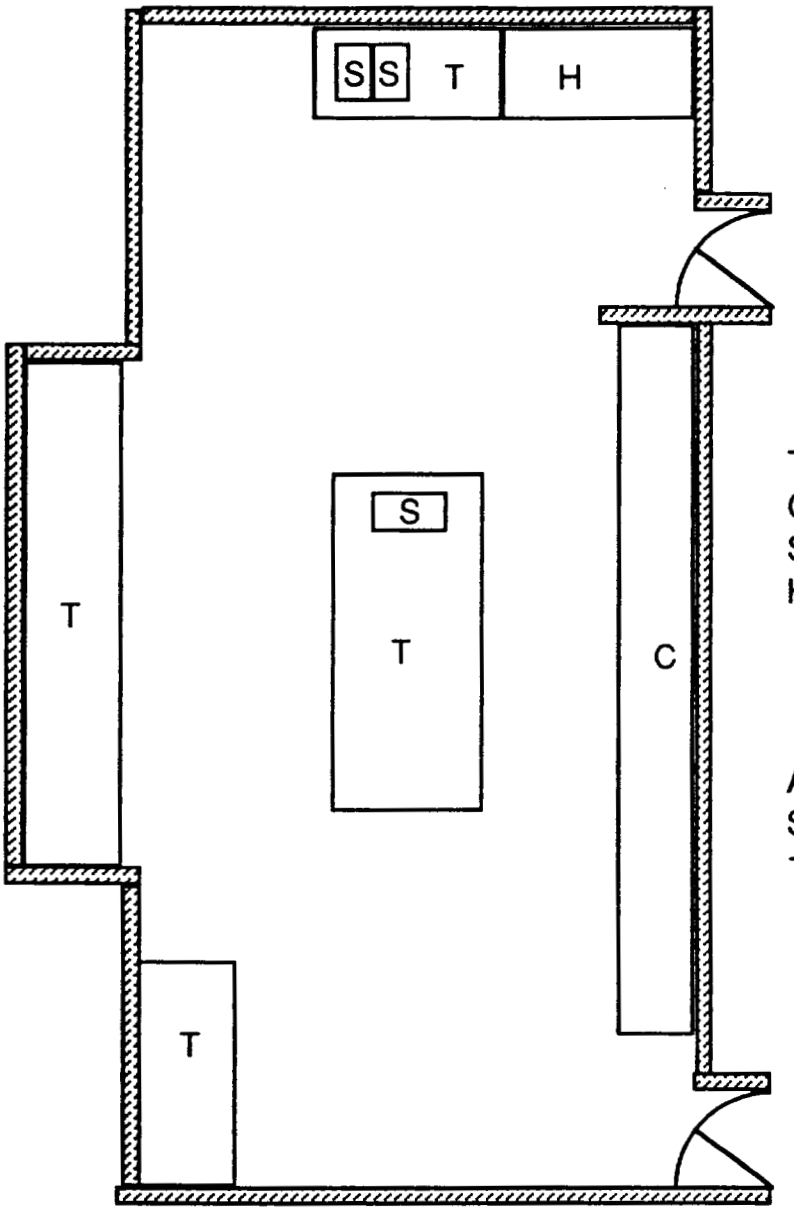
ATTACHMENT #4



T - TABLE
C - CABINET
S - SINK
H - HOOD

APPROXIMATE
SCALE:
1" = 6'

ATTACHMENT #5

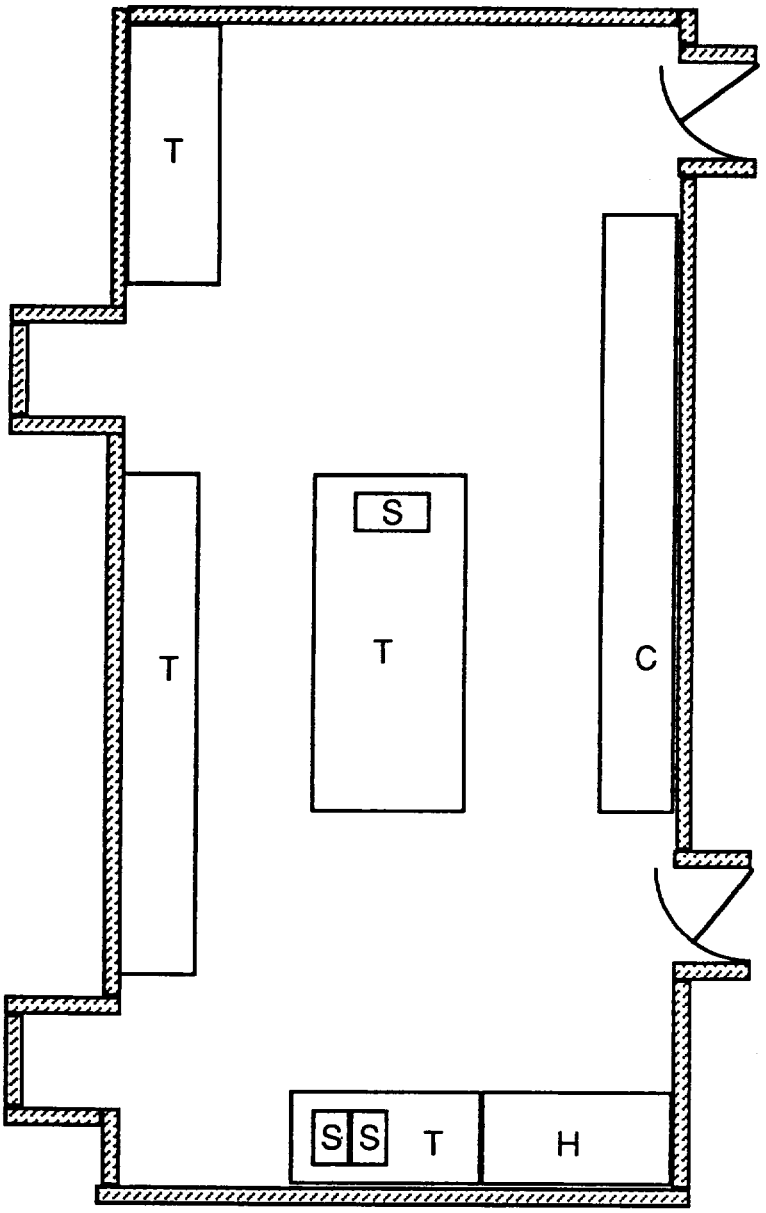


T - TABLE
C - CABINET
S - SINK
H - HOOD

APPROXIMATE
SCALE:
1" = 6'

ROOM
F-304

ATTACHMENT #6



T - TABLE
C - CABINET
S - SINK
H - HOOD

APPROXIMATE
SCALE:
1" = 6'

ROOM
F-306

This is to acknowledge the receipt of your letter/application dated

12/21/2005, and to inform you that the initial processing which includes an administrative review has been performed.

☑ RENEW 37-11185-04 There were no administrative omissions. Your application was assigned to a technical reviewer. Please note that the technical review may identify additional omissions or require additional information.

☐ Please provide to this office within 30 days of your receipt of this card

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A copy of your action has been forwarded to our License Fee & Accounts Receivable Branch, who will contact you separately if there is a fee issue involved.

Your action has been assigned **Mail Control Number** 138148.
When calling to inquire about this action, please refer to this control number.
You may call us on (610) 337-5398, or 337-5260.

NRC FORM 532 (RI)
(6-96)

Sincerely,
Licensing Assistance Team Leader