

APPLICATION FOR BYPRODUCT MATERIAL LICENSE
INDUSTRIAL

1. APPLICATION FOR:
(Check and/or complete as appropriate)

a. NEW LICENSE

b. AMENDMENT TO:
LICENSE NUMBER

c. RENEWAL OF:
LICENSE NUMBER

X 04-13893-02

See attached instructions for details.

Completed applications are filed in duplicate with the Division of Fuel Cycle and Material Safety, Office of Nuclear Material Safety, and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555 or applications may be filed in person at the Commission's office at 1717 H Street, NW, Washington, D. C. or 7915 Eastern Avenue, Silver Spring, Maryland.

2. APPLICANT'S NAME (Institution, firm, person, etc.)

U.S. Department of Commerce
NOAA, NMFS, SWFC, Tiburon Laboratory
TELEPHONE NUMBER: AREA CODE - NUMBER EXTENSION
(415) 435-3183; 435-3149

3. NAME AND TITLE OF PERSON TO BE CONTACTED
REGARDING THIS APPLICATION

Dr. R. Bruce MacFarlane
TELEPHONE NUMBER: AREA CODE - NUMBER EXTENSION
(415) 435-3183; (415) 435-3149 x44

4. APPLICANT'S MAILING ADDRESS (Include Zip Code)

(Address to which NRC correspondence, notices, bulletins, etc., should be sent.)
NOAA, NMFS, SWFC, Tiburon Laboratory
3150 Paradise Drive
Tiburon, CA 94920

5. STREET ADDRESS WHERE LICENSED MATERIAL WILL BE USED
(Include Zip Code)

3150 Paradise Drive
Tiburon, CA 94920

(IF MORE SPACE IS NEEDED FOR ANY ITEM, USE ADDITIONAL PROPERLY KEYED PAGES.)

6. INDIVIDUAL(S) WHO WILL USE OR DIRECTLY SUPERVISE THE USE OF LICENSED MATERIAL
(See Items 16 and 17 for required training and experience of each individual named below)

FULL NAME

TITLE

a. Robert Bruce MacFarlane

Oceanographer (Research)

b. Pete Edward Benville, Jr.

Research Chemist

c.

7. RADIATION PROTECTION OFFICER

Dr. R. Bruce MacFarlane

Attach a resume of person's training and experience as outlined in Items 16 and 17 and describe his responsibilities under Item 15.

8. LICENSED MATERIAL

LINE NO.	ELEMENT AND MASS NUMBER A	CHEMICAL AND/OR PHYSICAL FORM B	NAME OF MANUFACTURER AND MODEL NUMBER (If Sealed Source) C	MAXIMUM NUMBER OF MILLCURIES AND/OR SEALED SOURCES AND MAXIMUM ACTI- VITY PER SOURCE WHICH WILL BE POSSESSED AT ANY ONE TIME D
(1)	Nickel - 63	Sealed Source	Tracor Model 113550-3200, 113550-3201 or 111019	Single source 15 millicuries
(2)	Carbon - 14	Any		5 millicuries
(3)	Hydrogen - 3	Any		25 millicuries

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SCRIBE USE OF LICENSED MATERIAL
E

- (1) Used in an electron capture detector installed in a 550 Tracor gas chromatograph for quantitating organic compounds.
- (2) Uptake and metabolism studies for aquatic animals.
- (3) Uptake and metabolism studies for aquatic animals.
- (4)

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9. STORAGE OF SEALED SOURCES

LINE NO.	CONTAINER AND/OR DEVICE IN WHICH EACH SEALED SOURCE WILL BE STORED OR USED. A.	NAME OF MANUFACTURER B.	MODEL NUMBER C.
(1)	Electron capture detector	Tracor	550-1
(2)			
(3)			
(4)			

10. RADIATION DETECTION INSTRUMENTS

LINE NO.	TYPE OF INSTRUMENT A.	MANUFACTURER'S NAME B.	MODEL NUMBER C.	NUMBER AVAILABLE D.	RADIATION DETECTED (alpha, beta, gamma, neutron) E.	SENSITIVITY RANGE (milliroentgens/hour or counts/minute) F.
(1)	Liquid scintillation counter	Packard	2111	1	Beta-gamma	
(2)						
(3)						
(4)						

11. CALIBRATION OF INSTRUMENTS LISTED IN ITEM 10

☐ a. CALIBRATED BY SERVICE COMPANY
NAME, ADDRESS, AND FREQUENCY

☒ b. CALIBRATED BY APPLICANT

Attach a separate sheet describing method, frequency and standards used for calibrating instruments.

See attachment No. 4

12. PERSONNEL MONITORING DEVICES

TYPE (Check and/or complete as appropriate.) A.	SUPPLIER (Service Company) B.	EXCHANGE FREQUENCY C.
<input type="checkbox"/> (1) FILM BADGE N.A.	N.A.	<input type="checkbox"/> MONTHLY N.A.
<input type="checkbox"/> (2) THERMOLUMINESCENCE DOSIMETER (TLD)		<input type="checkbox"/> QUARTERLY
<input type="checkbox"/> (3) OTHER (Specify): _____		<input type="checkbox"/> OTHER (Specify): _____

13. FACILITIES AND EQUIPMENT (Check where appropriate and attach annotated sketch(es) and description(s).)

- ☒ a. LABORATORY FACILITIES, PLANT FACILITIES, FUME HOODS (Include filter, if any), ETC.
- ☒ b. STORAGE FACILITIES, CONTAINERS, SPECIAL SHIELDING (fixed and/or temporary), ETC. See attachment No. 5
- ☐ c. REMOTE HANDLING TOOLS OR EQUIPMENT, ETC.
- ☐ d. RESPIRATORY PROTECTIVE EQUIPMENT, ETC.

14. WASTE DISPOSAL

- a. NAME OF COMMERCIAL WASTE DISPOSAL SERVICE EMPLOYED
Southwest Nuclear Company, 7066-A Commerce Circle, Pleasanton, CA 94566
- b. IF COMMERCIAL WASTE DISPOSAL SERVICE IS NOT EMPLOYED, SUBMIT A DETAILED DESCRIPTION OF METHODS WHICH WILL BE USED FOR DISPOSING OF RADIOACTIVE WASTES AND ESTIMATES OF THE TYPE AND AMOUNT OF ACTIVITY INVOLVED. IF THE APPLICATION IS FOR SEALED SOURCES AND DEVICES AND THEY WILL BE RETURNED TO THE MANUFACTURER, SO STATE
N.A.

INFORMATION REQUIRED FOR ITEMS 15, 16 AND 17

Describe in detail the information required for Items 15, 16 and 17. Begin each item on a separate page and key to the application as follows:

15. RADIATION PROTECTION PROGRAM. Describe the radiation protection program as appropriate for the material to be used including the duties and responsibilities of the Radiation Protection Officer, control measures, bioassay procedures (if needed), day-to-day general safety instruction to be followed, etc. If the application is for sealed source's also submit leak testing procedures, or if leak testing will be performed using a leak test kit, specify manufacturer and model number of the leak test kit.
16. FORMAL TRAINING IN RADIATION SAFETY. Attach a resume for each individual named in Items 6 and 7. Describe individual's formal training in the following areas where applicable. Include the name of person or institution providing the training, duration of training, when training was received, etc.
 - a. Principles and practices of radiation protection.
 - b. Radioactivity measurement standardization and monitoring techniques and instruments.
 - c. Mathematics and calculations basic to the use and measurement of radioactivity.
 - d. Biological effects of radiation.
17. EXPERIENCE. Attach a resume for each individual named in Items 6 and 7. Describe individual's work experience with radiation, including where experience was obtained. Work experience or on-the-job training should be commensurate with the proposed use. Include list of radioisotopes and maximum activity of each used.

18. CERTIFICATE

(This item must be completed by applicant.)

The applicant and any official executing this certificate on behalf of the applicant named in Item 2, certify that this application is prepared in conformity with Title 10, Code of Federal Regulations, Part 30, and that all information contained herein, including any supplements attached hereto, is true and correct to the best of our 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.

a. LICENSE FEE REQUIRED
(See Section 170.31, 10 CFR 170)

N.A.

(1) LICENSE FEE CATEGORY: N.A.

(2) LICENSE FEE ENCLOSED: \$ N.A.

b. CERTIFYING OFFICIAL (Signature)

R. Bruce MacFarlane

c. NAME (Type or print)

Dr. R. Bruce MacFarlane

d. TITLE

Oceanographer (Research)

e. DATE

26 October 1982

Application for Byproduct Material License

Attachment No. 1

Item No. 15

Radiation Protection Program

L.B. →
says ok

Radiation Protection Officer - Dr. R. Bruce MacFarlane is an oceanographer with the National Marine Fisheries Service. Duties include supervising and conducting research on the effects of natural and anthropogenic factors on the biochemistry and physiology of aquatic organisms. Responsibilities relating to radioisotope usage include maintenance of records concerning isotope usage, safe storage of isotopes, and appropriate disposal. Other than the sealed source isotope used by P. E. Benville, the Radiation Protection Officer is the only person using radioisotopes and will insure that they are clearly identified, stored away from other chemicals in sealed containers and disposed of according to NRC and waste disposal service instructions. Sealed source radioisotope (^{63}Ni) will be used in Tracor 550 gas chromatograph exclusively. A thermal limit switch prevents detector from exceeding 300°C . Leak tests will be performed using Western Scientific Associates (P. O. Box 698, Danville, CA 94526) Wipe Test Kit. Wipes will be packaged according to their specifications and shipped to them. Other radioisotopes will be stored in containers provided by suppliers (e.g., New England Nuclear) and will be used in a positive pressure, vented hood. Disposable gloves and aprons will be used at all times. Routine area survey tests will be conducted in hood area. Survey will be done after each usage of radioisotope and assayed with a Packard Tricarb (Model 2111) LSC. The levels of contamination will be less than the acceptable levels of air and waste water disposal of ^3H and ^{14}C . All compounds to be used will be in the nano- to micro-curie range for any experiment. Records of surveys and radioisotope usage will be kept in a bound record book for the required amount of time as specified in Part 20 of the N.R.C. Rules and Regulations.

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Attachment No. 2

Item No. 16

ITEM	TYPE OF TRAINING	PROFESSOR	LOCATION	DURATION	YEAR
<u>R. Bruce MacFarlane</u>					
a.	Radiochemistry* (CHEM 407)	Dr. G. Choppin	Florida St. Univ.	1 quarter	1969
b.	" " "	" " "	" " "	" "	"
c.	" " "	" " "	" " "	" "	"
d.	" " "	" " "	" " "	" "	"

* Radioisotopes used in this course: ^{14}C , ^{152}Eu , ^{137}Cs , Ra (D-E std, NBS), ^{147}Pm , ^{204}Tl , ^{32}P , ^{131}I , ^{35}S , ^{22}Na , ^{60}Co , ^{115}In , ^{116}In .

Pete E. Benville, Jr.

a.	Radiochemistry*	Dr. Carr	Wash. St. Univ.	1 semester	1959
b.	"	" "	" " "	" "	"
c.	"	" "	" " "	" "	"
d.	"	" "	" " "	" "	"

* Radioisotopes used in this course: ^{14}C , ^{60}Co , ^{204}Tl , ^{238}U , ^{65}Zn , ^{210}Pb .

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Attachment No. 3
Item No. 17

ISOTOPE	MAX. AMT	LOCATION	DURATION	USE
<u>R. Bruce MacFarlane</u>				
^{14}C	50 mCi	Dept. of Oceanography, Florida State Univ., Tallahassee, FL	1 yr	Primary productivity measurements
	20 μCi	Tiburon Laboratory, Tiburon, CA	3 mo	Corticosteroid sepa- rations methods development
^{32}P	10 mCi	Dept. of Oceanography, Florida State Univ., Tallahassee, FL	1 yr	Adenosine triphosphate exchange reaction kinetics
<u>Pete E. Benville, Jr.</u>				
^{14}C	5 mCi	Western Fish Nutr. Lab., Cook, WA	6 mo	Trace pathway of pesticides
		Tiburon Laboratory, Tiburon, CA	4 yr	Trace pathway of aromatics
^3H	25 mCi	Western Fish Nutr. Lab., Cook, WA	6 mo	Trace pathway of pesticides
		Tiburon Laboratory, Tiburon, CA	1 yr	Trace pathway of aromatics
^{63}Ni	15 mCi	Fish Control Lab., La Crosse, WI	1.5 yr	Electron capture detector
		Tiburon Laboratory, Tiburon, CA	13 yr	Electron capture detector

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Attachment No. 4

Item No. 116

Calibrated with quenched and unquenched reference standards procured from Packard.
Calibrated before and during each experiment.

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ATTACHMENT NO. 5

Item #13

The electron capture detector containing Nickel⁶³ is located in the GAS Chromatography Room on the second floor of the Physiology Building (Diagram 2). The Carbon¹⁴ and Hydrogen³ will be stored in a concrete building (Diagram 3) adjacent to the Physiology Building. The concrete building has a steel door which is kept locked.

The Physiology Building has three exit doors with locks and is equipped with various safety devices, e.g., fire extinguishers, liquid spill kit, first aid kits, solvent disposal can, shower, etc. The Wet Lab (Diagram 1) has two rooms with exhaust fans to provide continuous ventilation.

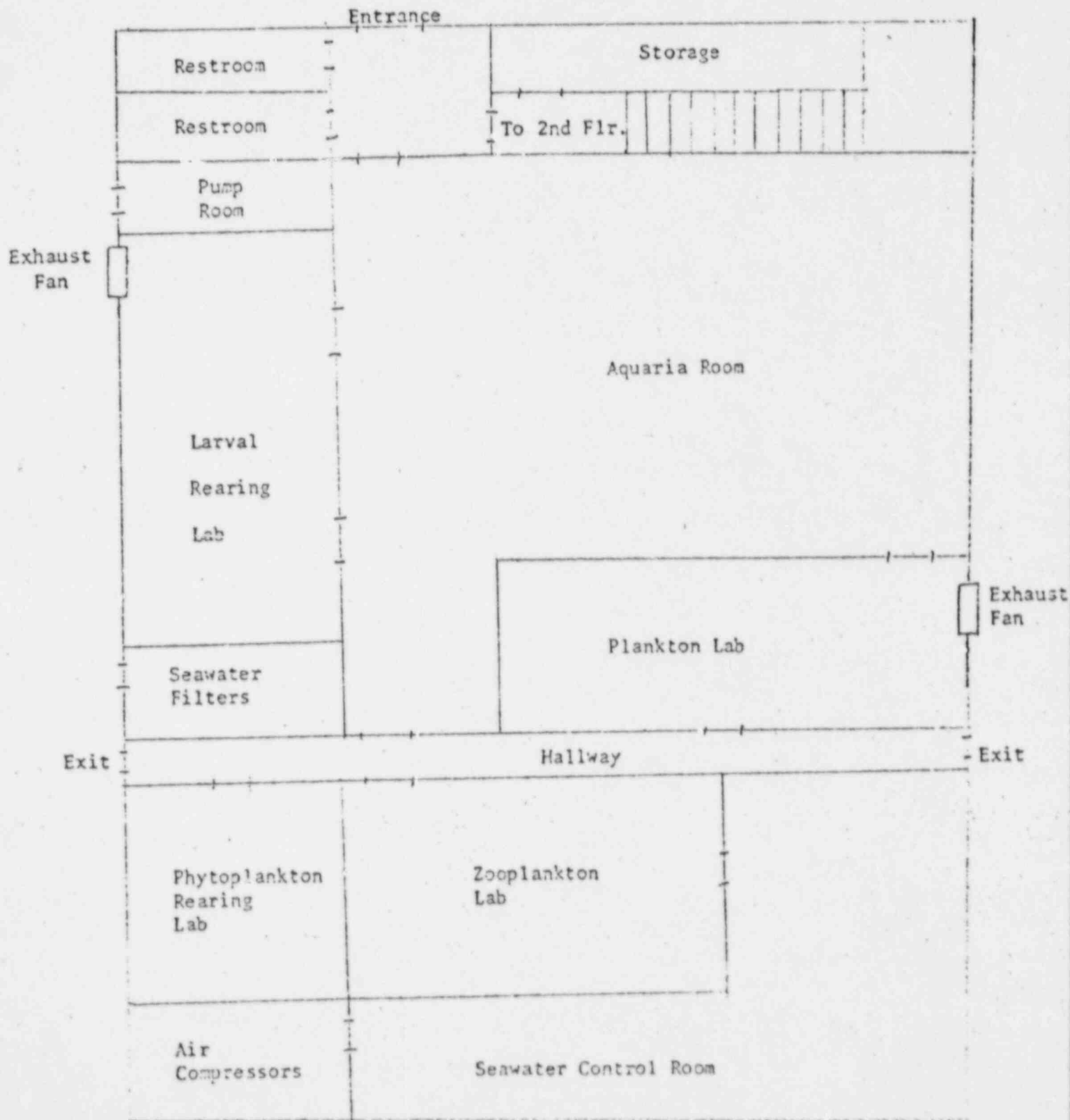
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ATTACHMENT NO. 5

Item 13

Diagram 1

Physiology Building (First Floor)
Net Laboratory



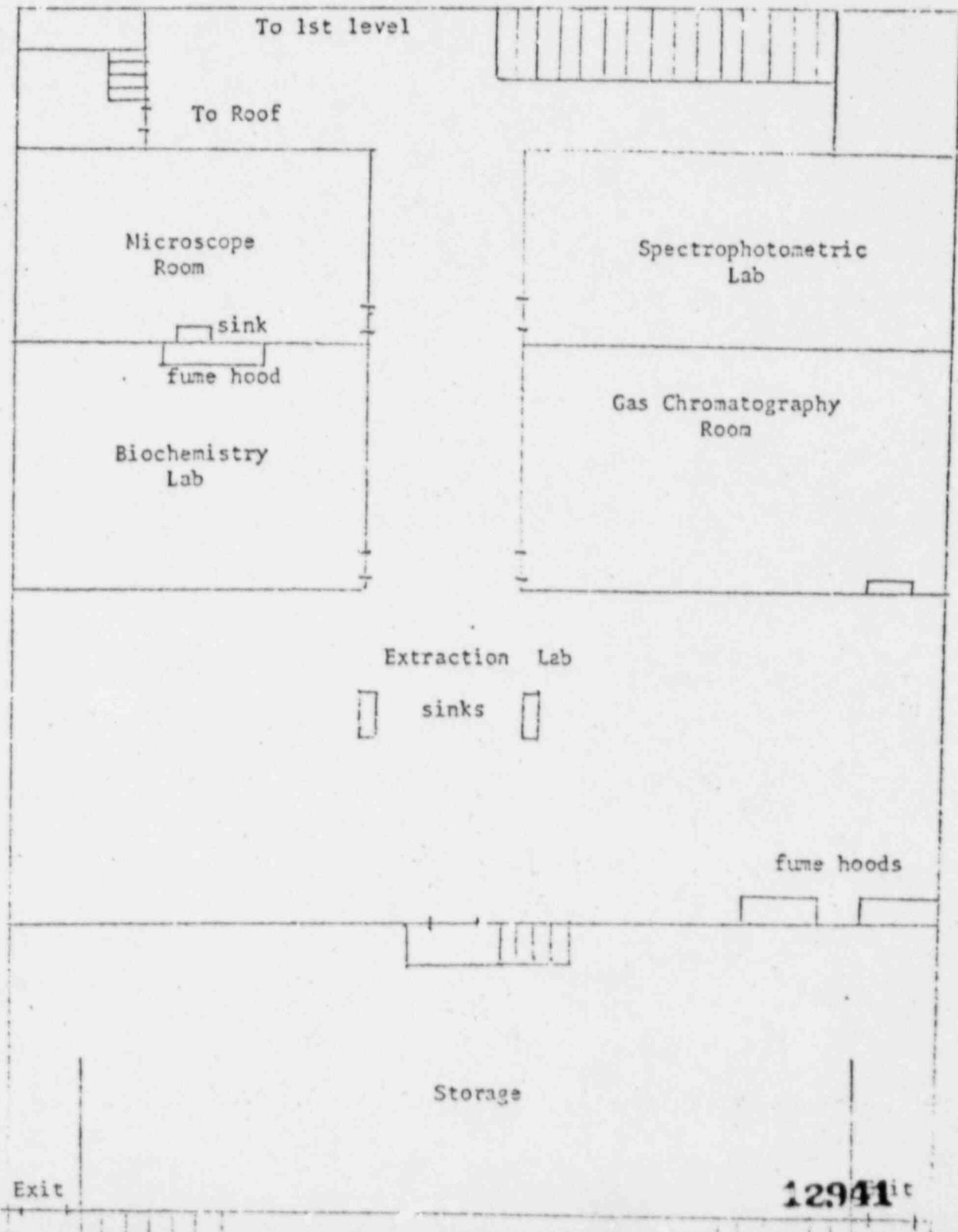
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ATTACHMENT NO. 5

Item 13

Diagram 2

Physiology Building (Second Floor)
Chemistry Laboratory



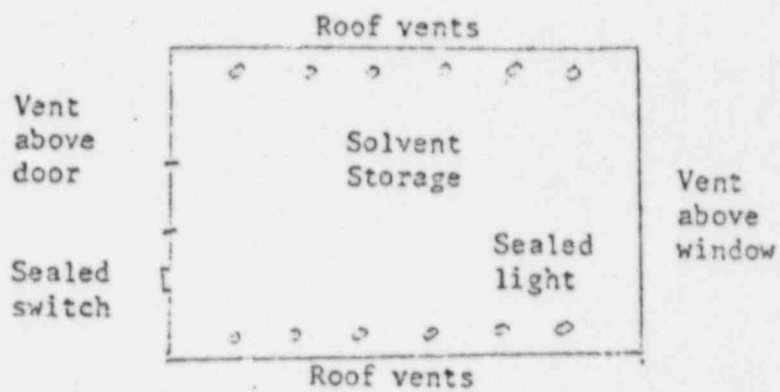
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ATTACHMENT NO. 5

Item 13

Diagram 3

Solvent Storage Building
(Building #32)



Physiology Building