P. R. GUINN

United States Department of the Interior

GEOLOGICAL SURVEY
RESTON, VA 22092 85 APR 23 A 9:34
18 April 1985

In Reply Refer To:
Mail Stop 990

Mr. Paul R. Guinn
U.S. Nuclear Regulatory Commission
Region II
Material Radiation Protection Section
101 Marietta Street, NW, Suite 2900
Atlanta, GA 30323

Ref: 45-15923-01
Docket No. 030-100034
Control No. 17197

Dear Mr. Guinn:

This letter is to request amendment of Materials License 45-15923-01, which is pending renewal under an application deemed timely filed under the docket and control numbers cited above.

Amendment is requested to permit use of the licensed material listed below by Dr. Derek R. Lovley and Dr. Ronald R. Cohen, whose education and training are listed on attachments 1 & 2.

The material to be licensed is as follows:

Element and Mass No.	Form	Maximum Amount
Hydrogen-3	Tritiated compounds	2 millicuries
Carbon-14	Labeled compounds & carbonate	2 millicuries
Phosphorus-32	Labeled compounds	1 millicurie
Phosphorus-33	Labeled compounds	1 millicurie
Sulfur-35	Labeled compounds & sulfuric acid	2 millicuries

The licensed material is to be used for tracer studies to assay the metabolic activity of microorganisms in cultures and natural samples of water and sediments. No more than 1 microcurie of licensed material will be added per sample.

All operations using the licensed material will be performed on the fifth floor of the Geological Survey's National Center Building at the license address. Sketches of the fifth floor and of the facilities in the rooms affected are shown in attachments 3 through 6. Manipulation of the material will be done in hoods located in rooms 5B225 or 5B135, or, if no gases are involved, occasionally on the bench adjacent to the assay instrument, a liquid scintillation counter in room 5B133. Storage of the licensed material and loaded scintillation vials will be in refrigerators in rooms 5B225 or 5B135. Storage of solid wastes, for example, soiled paper, in plastic bags, and of liquid wastes, in scintillation vials, will be within cabinet doors under the bench adjacent to the liquid scintillation counter in room 5B133. Vials will be transported in styrofoam coolers.

Samples for liquid scintillation counting and wipe tests will be counted in an LKB 1219 Rackbeta liquid scintillation counter. The instrument is self-calibrated by a shielded external standard of 5 microcuries of radium-226.

A protective laboratory coat and vinyl gloves will be worn during manipulation of licensed material, to prevent contact with skin. Personal film badge monitoring will be required of the users, under a contract currently with Siemens Gammasonics, Inc.

Hood and bench areas and vial holders will be routinely surveyed with a Ludlum Measurements counter and 44-4 beta-sensitive probe after each session of manipulation of licensed material. The survey instrument will be calibrated annually by a qualified contractor. The exterior and interior surfaces of the liquid scintillation counter will be surveyed with the same instrument on a weekly basis during active use of the equipment and quarterly otherwise. In case of any indication of contamination in these surveys, wipe tests will be performed and measured in the liquid scintillation counter. Wipe tests will be conducted at least semiannually during periods of use of licensed material or upon resumption of use after a period of non-use.

The activities in scintillation vials will not exceed 0.02 microcurie. Scintillation vials containing only hydrogen-3 and carbon-14 activity will be disposed of per 10CFR20.306(a). Scintillation vials containing other licensed materials, which have short half lives, will be held until the residual activity has decreased to less than 0.001 microcurie and then disposed of with respect to their non-radioactive hazard.

Records of material inventories, receipt and disposal of licensed material, surveys, and wipe tests, will be maintained by the users and examined by the radiation protection officer.

We wish to start these experiments at the beginning of this summer, and should appreciate approval of the amendment by that time.

Sincerely yours,

Allan B. Tanner

Allan B. Tanner
Radiation Protection Officer

Attachments

Name: Derek R. Lovley **Title:** Hydrologist

Formal Education:

Institution and Location (City & State)	Dates of Attendance	Degree	Field
University of Connecticut Storrs, Connecticut	9/71 - 5/75	B.A.	Biology
Clark University Worcester, Massachusetts	9/76 - 6/78	M.A.	Biology
Michigan State University East Lansing, Michigan	9/78 - 8/82	Ph.D.	Microbiology

Formal Courses Relevant To:
(a) Principles and practices of radiation protection.
(b) Radioactivity measurement standardization and monitoring techniques and instruments.
(c) Math calculations basic to use and measurement of radioactivity.
(d) Biological effects of radiation.

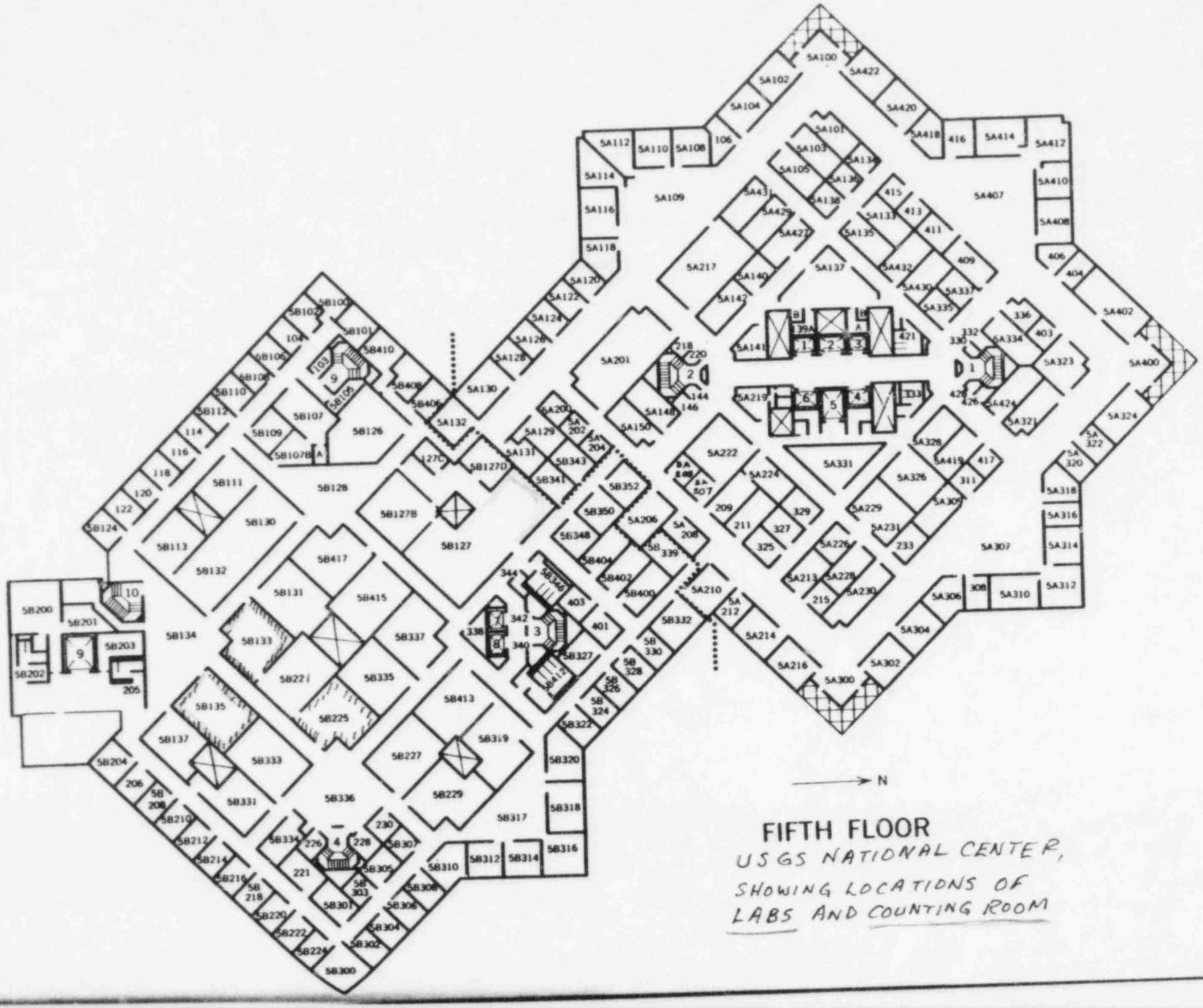
Course	Where?	How Long?	Relevant to (Check) (a)	(b)	(c)	(d)
Physics	University of Connecticut	2 semesters		X		
Physical Chemistry	Michigan State University	2 quarters		X		
General Chemistry	University of Connecticut	2 semesters		X		
Calculus	University of Connecticut	2 semesters			X	
Animal Physiology	University of Connecticut	1 semester				X
Cell Biology	University of Connecticut	1 semester				X
Biochemistry	University of Connecticut & Michigan State University	2 years				X

On-The-Job-Training Relevant to Above:

Employer	Type of Work	Time Applicable To (a) (b) (c) (d)
Michigan State University	Research Assistant	3 years

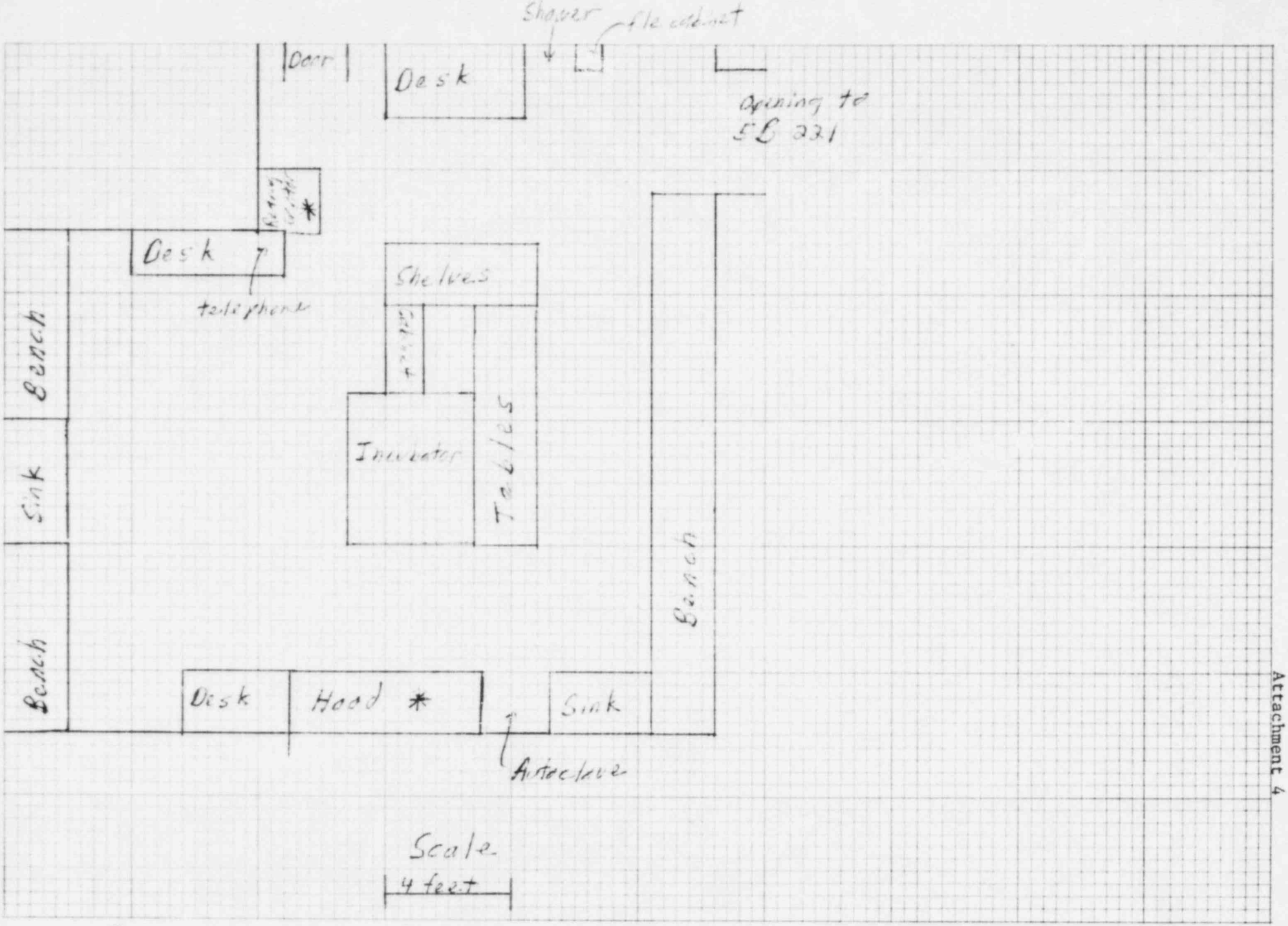
Experience with Radiation:

Isotope	Maximum Amount	Where Experience Was Gained	Duration	Type of Use
C-14	1 mCi	Michigan State University	3 years	Metabolic Trace Studies
S-35	1 mCi	Michigan State University	3 years	Metabolic Tracer Studies



FIFTH FLOOR
USGS NATIONAL CENTER,
SHOWING LOCATIONS OF
LABS AND COUNTING ROOM

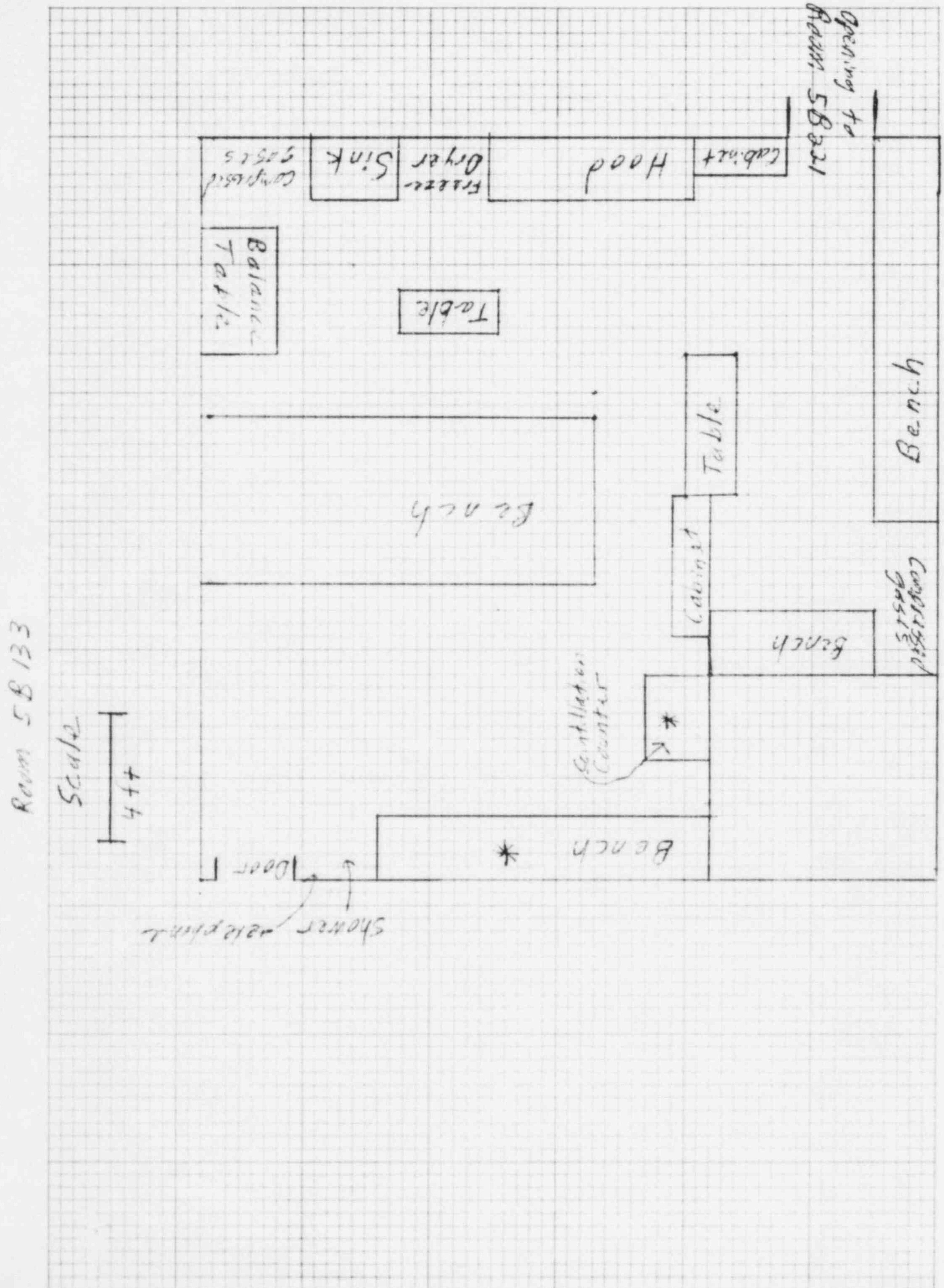
Attachment 3

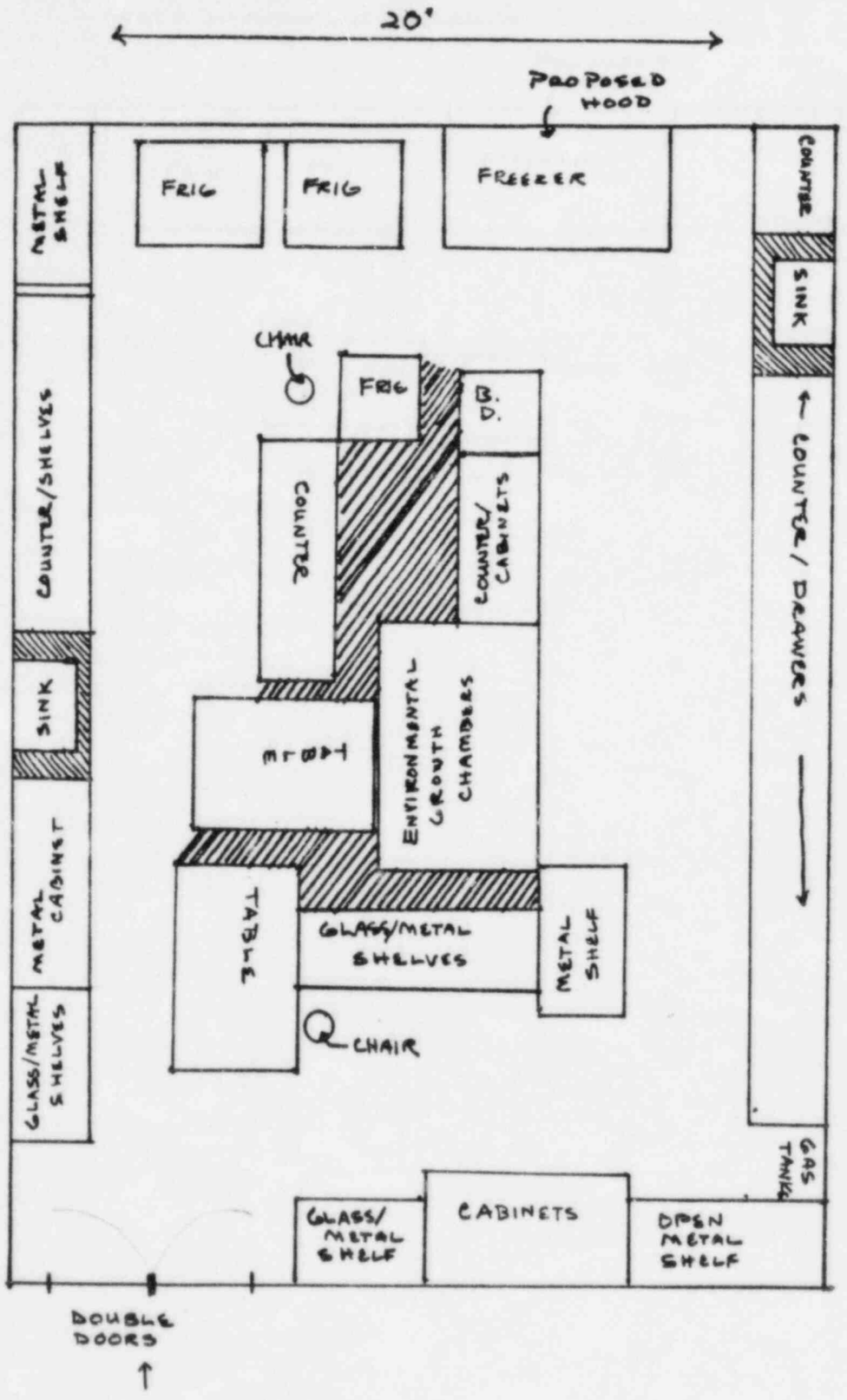


Room 5B235

Attachment 4

Attachment 5





SCALE: 1/4" = 1' (APPROX.)

(COHEN LAB) 5B135