

NRC FORM 213
(10-87)
10 CFR 30, 32, 33, 34,
35 and 40

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED BY OMB
3150-0120
Expires: 6-30-90

APPLICATION FOR MATERIAL LICENSE

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.

APPLICATIONS FOR DISTRIBUTION OF EXEMPT PRODUCTS FILE APPLICATIONS WITH:

U.S. NUCLEAR REGULATORY COMMISSION
DIVISION OF FUEL CYCLE AND MATERIAL SAFETY, NMSS
WASHINGTON, DC 20545

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:

U.S. NUCLEAR REGULATORY COMMISSION, REGION I
NUCLEAR MATERIALS SAFETY SECTION B
475 ALLENDALE ROAD
KING OF PRUSSIA, PA 19406

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

U.S. NUCLEAR REGULATORY COMMISSION, REGION II
NUCLEAR MATERIALS SAFETY SECTION
101 MARIETTA STREET, SUITE 2900
ATLANTA, GA 30329

IF YOU ARE LOCATED IN:

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

U.S. NUCLEAR REGULATORY COMMISSION, REGION III
MATERIALS LICENSING SECTION
799 ROOSEVELT ROAD
GLEN ELLYN, IL 60137

ARKANSAS, COLORADO, IDAHO, KANSAS, LOUISIANA, MONTANA, NEBRASKA, NEW MEXICO, NORTH DAKOTA, OKLAHOMA, SOUTH DAKOTA, TEXAS, UTAH, OR WYOMING, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION IV
MATERIAL RADIATION PROTECTION SECTION
811 RYAN PLAZA DRIVE, SUITE 1000
ARLINGTON, TX 76011

ALASKA, ARIZONA, CALIFORNIA, HAWAII, NEVADA, OREGON, WASHINGTON, AND U.S. TERRITORIES AND POSSESSIONS IN THE PACIFIC, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION V
NUCLEAR MATERIALS SAFETY SECTION
1450 MARIA LANE, SUITE 210
WALNUT CREEK, CA 94606

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 JURISDICTION.

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

- A. NEW LICENSE
- B. AMENDMENT TO LICENSE NUMBER _____
- C. RENEWAL OF LICENSE NUMBER 01-10058-02

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

U.S. Dept. of the Interior, Fish & Wildl. Serv.
Southeastern Fish Cultural Laboratory
Rt. 3 Box 86
Marion, AL 36756

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

Southeastern Fish Cultural Laboratory
Rt. 3 Box 86
Marion, AL 36756

4. NAME OF PERSON TO BE CONTACTED ABOUT THIS APPLICATION

Mary Anna Davis

TELEPHONE NUMBER

(205) 683-6175

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 AND EXPERIENCE.

8. TRAINING FOR INDIVIDUALS WORKING IN OR FREQUENTING RESTRICTED AREAS.

9. FACILITIES AND EQUIPMENT.

10. RADIATION MONITORING PROGRAM.

11. WASTE MANAGEMENT.

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

FEE CATEGORY 3M AMOUNT ENCLOSED \$ Exempt

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, 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.

SIGNATURE—CERTIFYING OFFICER

TYPED/PRINTED NAME

TITLE

DATE

Mary Anna Davis

Mary Anna Davis

Biological Technician

5-28-89

Radiation Safety Officer

8910180319 890929
REG2 LIC30
01-10058-02 PDR

FOR NRC USE ONLY

TYPE OF FEE FEE LOG FEE CATEGORY COMMENTS

FEE EXEMPT

APPROVED BY

AMOUNT RECEIVED

CHECK NUMBER

DATE

5. Radioactive Material:

1. a. Hydrogen - 3
b. Pesticides and organic biochemicals such as amino acids, fatty acids, lipids, carbohydrates, vitamins, and salts.
c. 100 mCi
2. a. Carbon - 14
b. Pesticides and organic biochemicals such as amino acids, fatty acids, lipids, carbohydrates, vitamins, and salts.
c. 10 mCi
3. a. Iodine - 125
b. Iodide and labeled thyroxine, triiodothyronine, mono- and di-iodotyrosine, labeled proteins, and hormones.
c. 1 mCi
4. a. Sodium - 22
b. Labeled sodium as NaCl
c. 1 mCi
5. a. Radium - 26
b. Sealed source - Packard Instrument Co., Inc., Model PL Pries Liquid Scintillation Counter.
c. 20 uCi
6. a. Iodine - 129
b. Sealed source - Packard Instrument Co., Inc., Model C5301 Multi-Pries I Gamma Counter.
c. 0.03 uCi

N/A

exempt

0.1 uCi
APP C

6. Purposes for which licensed material will be used:

1. Hydrogen - 3
Tritiated organic biochemicals are used in studies of metabolic pathways and nutrition of fishes.
2. Carbon - 14
Carbon labeled pesticides are used for studies of residue uptake, storage, and release by aquatic organisms (ancillary method to chemical assay).
Carbon labeled biochemicals are used in studies of metabolic pathways and nutrition of fishes (ancillary method to chemical assay).
3. Iodine - 125
Radioiodine is used for studies of fish thyroid function and radioimmunoassays.
4. Sodium - 22
Labeled sodium is used to measure Na flux between an organism and water.
5. Radium - 226
External standard source in Prias Liquid Scintillation Counter.
6. Iodine - 129
Internal standard in Multi-Prias I Gamma Counter.

7. Individuals responsible for radiation safety program and their training and experience:

Mary Anna Davis - Biological Technician (Fisheries):

Training: Formal course "Radiation Safety Specialist Training Program" - 40 hrs. - Oklahoma State University, 1981

Related Training: Math, Chemistry, Physics - 32 sem. hrs.
Biology - 37 sem. hrs.

Experience: 10 years of low level (250 uCi maximum) radioisotope use in radioimmunoassays, competitive protein binding radioassay and metabolism studies.

Isotopes: ¹²⁵I ³H ¹⁴C

Dr. Ken B. Davis - Physiologist

Training: Radiation worker - certified by Radiological Safety Office, Memphis State University, 8 hrs., March 1978.

Related Training: Math, Chemistry, Physics - 51 sem. hrs.
Biology - Approximately 100 sem. hrs.

Experience: 10 years of low level radioisotope use in competitive protein binding radioassay, radioimmunoassays, metabolism and osmoregulation studies.

Isotopes: ¹²⁵I ³H ²²Na

8. Training for individuals working in or frequenting restricted areas:

When entering on duty, all employees, volunteers, and summer workers undergo a laboratory safety orientation which includes an explanation of the radiation safety program. Restricted areas and warning signs and symbols are described and the use of personal protective equipment and radiation safety practices are discussed. Individuals who are not employees of the laboratory but who might work in the restricted areas (janitorial personnel, repairmen, etc.) are instructed when they are on the premises about the potential hazards in the restricted areas. Janitorial personnel under contract are advised both by letter and on-site of the hazards in the restricted areas. For specific information concerning training for workers in restricted areas, see Item 10, Radiation Safety Program and Attachment 4.

9. Facilities and Equipment

Radionuclide use areas are located in two of the main laboratory buildings on the property of Southeastern Fish Cultural Laboratory (see Attachment 1). The areas approved for use in the Main Laboratory are shown on the floor plan (Attachment 2). The room designated "Chem Lab 2" has a quarry tile floor and glazed tile walls, and is used for counting sealed samples. The area is restricted when samples are present and being processed. There are three closets with metal doors and exhaust fans (The one designated for radionuclide storage is labeled and locked); a sink work area; water and air; and floor drainage into the adjacent Chemistry Lab. The sink work area, when used for handling concentrated samples, is set up with secondary containers, trays with absorbent paper, lead bricks, hand-operated microliter pipettes and syringes, and containers and materials restricted for clean-up after initial handling of stock solutions. The Chemistry, Physiology, and Biology labs, constructed with quarry tile floors and glazed tile walls, are used for sample preparation. These labs are equipped with ceiling exhaust fans, emergency showers, floor drains, metal storage cabinets, chemical sinks, and fume hoods. They are supplied with domestic water, deionized water, air, gas, vacuum, and electricity. These areas are restricted when samples are present or being processed. Standard and ultramicro analytical equipment such as balances, glassware, Lang-Levy pipettes, Hamilton syringes, sample containers, etc. are used, with proper containment in trays lined with absorbent paper, for sample processing. Containers and facilities for decontamination and washing labware are reserved in these labs for clean-up after sample processing.

Our radiometric equipment presently consists of a Baird-Atomic Model 420 G.M. Survey Meter, Packard PRIAS PL liquid scintillation counter, and a Packard Multi-PRIAS I, Model C5301 gamma counter (specifications follow). Samples are transported in

sealed vials or tubes from preparation areas to the Chem Lab 2 for counting. Associated materials such as fluors, dispersants, vials and tubes for sample preparation and counting are stored in the Chemistry Lab. Non-radiometric equipment to be used in procedures requiring radionuclides consists of conventional instrumentation used in clinical and analytical chemistry such as gas-liquid and high pressure-liquid chromatographs, spectrophotometers, fluorescence spectrometer, etc., as well as other equipment such as centrifuges, tissue sectioning equipment, hematology equipment, microscopes, diet preparation facilities, etc. The lab also has materials and equipment for autoradiography of tissue sections and thin-layer chromatograms.

A "wet laboratory" (Attachment 3) situated adjacent to the main building is used for exposing or dosing test fishes and various invertebrates with radiolabeled compounds. A small isolation tank room has flow-through glass aquaria and static polyethylene tanks with covers for contact exposures or dosing by diet, and the floor and walls are concrete. It has enclosed drainage from tanks and aquaria to a tertiary sewage plant or to an outdoor sump that diverts non-contaminated waste water to a drainage ditch. Aerated artesian water is pumped to the wet lab continuously at over 140,000 gal/day and it can be increased to over 300,000 gal/day when necessary. The tank room has carts, trays, an autopsy area, dip nets, and miscellaneous containers for decontamination and containment of hot materials. The tank room has lockable metal doors and is designated as a restricted area when radionuclides are present.

Radiometric Equipment

Type - Baird-Atomic Model 420 G.M. Survey Meter
Number available - 1
Radiation detected - Beta, gamma
Sensitivity range - 0-100 mR/hr
Window thickness - 1.4
Use - Monitoring

Type - Packard PRIAS, Model PL Liquid Scintillation Counter
Number available - 1
Radiation detected - Beta, gamma (low energy)
Use - Measuring

Type - Packard Multi-PRIAS I, Model C5301 Gamma Counter
Number available - 1
Radiation detected - gamma
Use - Measuring

Instrument Calibration

The Model 420 survey meter is sent to either the manufacturer or to a licensed calibration service for recalibration annually. Calibration certificates are filed in the office of the Radiation Safety Officer. A sealed source on the instrument case is used for checks for nominal responses of each scale: 0.43 = 0.01, 0.44 = 0.01, and 0.45 = 0.01 mR/hr ($X = A$, $n=10$) at 0, 37, and 140 mm from the source, respectively (taken after December 1988 factory calibration). Batteries are replaced or high voltage adjustments are made if appreciable deviation from 900 v occurs between intervals of calibration. If deviations greater than 10% of the above rates occur and cannot be corrected by voltage adjustment, the unit is sent to the manufacturer for re-calibration as required.

Unquenched standards (purged with an inert gas and flame sealed) of tritium (346K dpm = 1.56%, May 1977), 14C (99.1K = 3.03%, May 1977) and "background" standard (Packard, Cat. No. 6008400, Ser. # 199) are used for precision and accuracy tests when the liquid scintillation counter is in use. Indicated malfunctions (greater than 10% deviation from the mean) are to be corrected by manufacturer's service on an as-needed basis. These readings are used to monitor instrument performance and confirm discriminator settings. The background standard is used to detect the presence of or changes in environmental radiation contamination and electronic noise.

Performance of the Multi-PRIAS gamma counter is verified with an integral quality control program which contains detector correlation, Chi-square, and background measurement routines. Acceptable values indicating proper operation are specified in the manual and deviations from these values are corrected by manufacturer's service. The unit automatically calibrates when not in use, adjusting the detector voltage to compensate for temperature and photomultiplier tube aging.

10. Radiation Safety Program

The intent of the laboratory's radiation protection plan is to provide protection to human health and property while using the powerful but potentially hazardous research tool radiometry provides, assuming that effects of any ionizing radiation are cumulative and potentially dangerous. The protocol to be followed provides for proper storage of concentrated stocks, samples to be analyzed, and wastes of sample workup; containment at each step of radionuclide handling, with monitoring for spills, leaks, and possible loss through aerosols, vapors, etc.; clean up and decontamination; accurate dose monitoring with prescribed postering of restricted areas and staff training; and emergency procedures when fires, explosions, or other emergencies potentiate

a radiation hazard. A primary restriction in the lab's use of by-product material is to judge from precedents in available techniques and from pilot studies the minimal amount of radioactivity necessary to accomplish a procedure and to use no greater than that amount. A major part of this approach is to maximize procedure efficiency and instrument performance, and use the most sensitive detection available.

Before work with a radionuclide is begun, a detailed study plan is prepared to anticipate and resolve any likely problems. Each such plan details ordering and storing the by-product material, setting up all necessary equipment for handling and administering the material, collecting material for sample preparation, accounting for all residual materials, and storage and final disposal of various forms of waste.

When an order of by-product material arrives, its assay information is logged, the sealed container is opened, tests for leakage of the primary container are performed, and the conditions are corrected if necessary before storage. Concentrated stocks are stored in a half-inch-thick lead container set inside a secondary vessel. Only chemically stable solutions of materials are to be used at the laboratory, e.g. ¹²⁵I in basic solution with or without stable isotope carrier. No labeled compounds that are labile at room temperature are to be used. If refrigeration is necessary, dilute preparations with proper lead shielding are stored in the refrigerator in the Chemistry Lab. Small volumes of concentrated stock are adjusted to correct volumes and made up in the necessary form for working solution, i.e. added buffer, etc., in trays lined with absorbent paper in secondary vessels to insure containment. Anyone handling radioactive material uses hand operated pipettes or syringes and wears surgical rubber gloves, a cotton lab coat, and a film badge. The working area in Chem Lab 2 is used for making up working solutions (20 uc or less) and for clean up afterwards. The storage closet is posted "Caution - Radioisotope Storage", the door is locked, and access is under user supervision. The other restricted areas are posted "Caution - Radiation Area". TLD badges are worn in the restricted areas and a record of radiation exposure is kept. The badges are supplied and read quarterly by United States Testing Company, Inc., 2800 George Washington Way, Richland Washington 99352. Records of background radiation at specific sites in restricted areas are kept for comparison with readings for suspected or known spills or inadvertent contamination. The survey meter's use is supplemented with spot check washes for tests with more sensitive detectors.

A copy of the Radioactive Materials section of the Station Safety Plan is included here (Attachment 4). The section includes employee responsibilities for the safe use, storage, handling and disposal of radioactive materials; duties of the Radiation Safety Officer; and laboratory safety rules which are posted in all areas approved for radionuclide use.

11. Waste Management

Liquid scintillation media containing tracer levels of ³H and ¹⁴C is disposed of in accordance with 10CFR 20.303 and 10CFR 20.306. After being counted, the media is poured into open containers which are placed in a fume hood or under an exhaust fan. The volatile constituents of the cocktail are evaporated and the residue is released to the sanitary sewage system. Vials are soaked in a decontaminating solution for 24 hours. Residual activity is measured on a sample of the vials, and if the counts are comparable to background counts as determined using new vials and cocktail only, vials are disposed of as regular garbage. If residual counts are at least twice background, the decontamination procedure is repeated until counts are acceptable.

Assay tubes containing tracer levels of ¹²⁵I are held in the Chem Lab 2 until residual radioactivity is comparable to background counts using new vials. When background levels are reached, tubes are disposed of as regular garbage.

A commercial firm has been contracted to supply waste disposal service for radioactive wastes other than the types mentioned above. The address of this NRC licensed firm is as follows:

Chem-Nuclear Systems, Inc
P.O. Box 725
Osborn Road
Barnwell, S.C. 29812
Phone (803) 259-1781

MARION NATIONAL FISH HATCHERY
 FERRY COUNTY, ALABAMA

UNITED STATES
 DEPARTMENT OF THE INTERIOR
 87°15'45"

LOCAL AND NEIGHBORING
 BOARD OF STATE ENGINEERS AND SURVEYORS
 87°18'30"



LEGEND
 — HATCHERY BOUNDARY
 — COOPERATIVE AGREEMENT BOUNDARY WITH STATE OF ALABAMA

BOUNDARY DESCRIPTION

STATION	BEARING	DISTANCE	FEET
1	N 89°15'00" E	100.00	100.00
2	S 77°18'30" W	100.00	100.00
3	S 89°15'00" W	100.00	100.00
4	N 77°18'30" E	100.00	100.00
5	N 89°15'00" E	100.00	100.00
6	S 77°18'30" W	100.00	100.00
7	S 89°15'00" W	100.00	100.00
8	N 77°18'30" E	100.00	100.00
9	N 89°15'00" E	100.00	100.00
10	S 77°18'30" W	100.00	100.00
11	S 89°15'00" W	100.00	100.00
12	N 77°18'30" E	100.00	100.00
13	N 89°15'00" E	100.00	100.00
14	S 77°18'30" W	100.00	100.00
15	S 89°15'00" W	100.00	100.00

NOTE: ALL DISTANCES ARE IN FEET.
 ALL ANGLES ARE IN DEGREES, MINUTES AND SECONDS.
 ALL CURVES ARE CIRCULAR.
 ALL DISTANCES ARE TO THE CENTER OF THE CURVE.
 ALL DISTANCES ARE TO THE CENTER OF THE CURVE.
 ALL DISTANCES ARE TO THE CENTER OF THE CURVE.

COMPILED IN THE DIVISION OF REALTY FROM
 SURVEYS BY BSP & W. DEPT. OF COMMERCE,
 AND AERIAL PHOTOGRAPHS

R8E
 SEC 15
 SEC 18
 SEC 22
 SEC 23
 T 20 N
 ST. STEPHENS MERIDIAN

MEAN
 DECLINATION
 1974

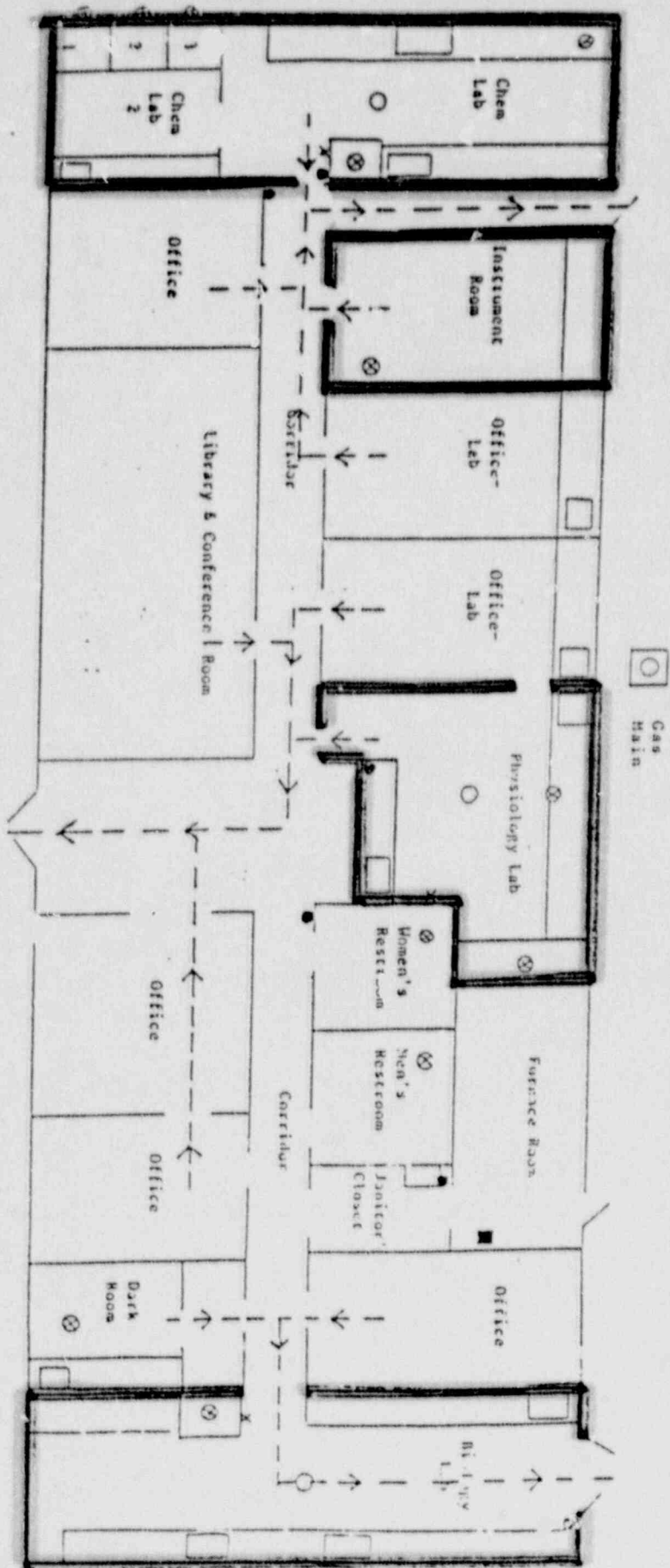
ATLANTA, GEORGIA
 APRIL, 1974

Scale 1" = 1000 FEET

VICINITY MAP
 SCALE 1" = 1 MILE

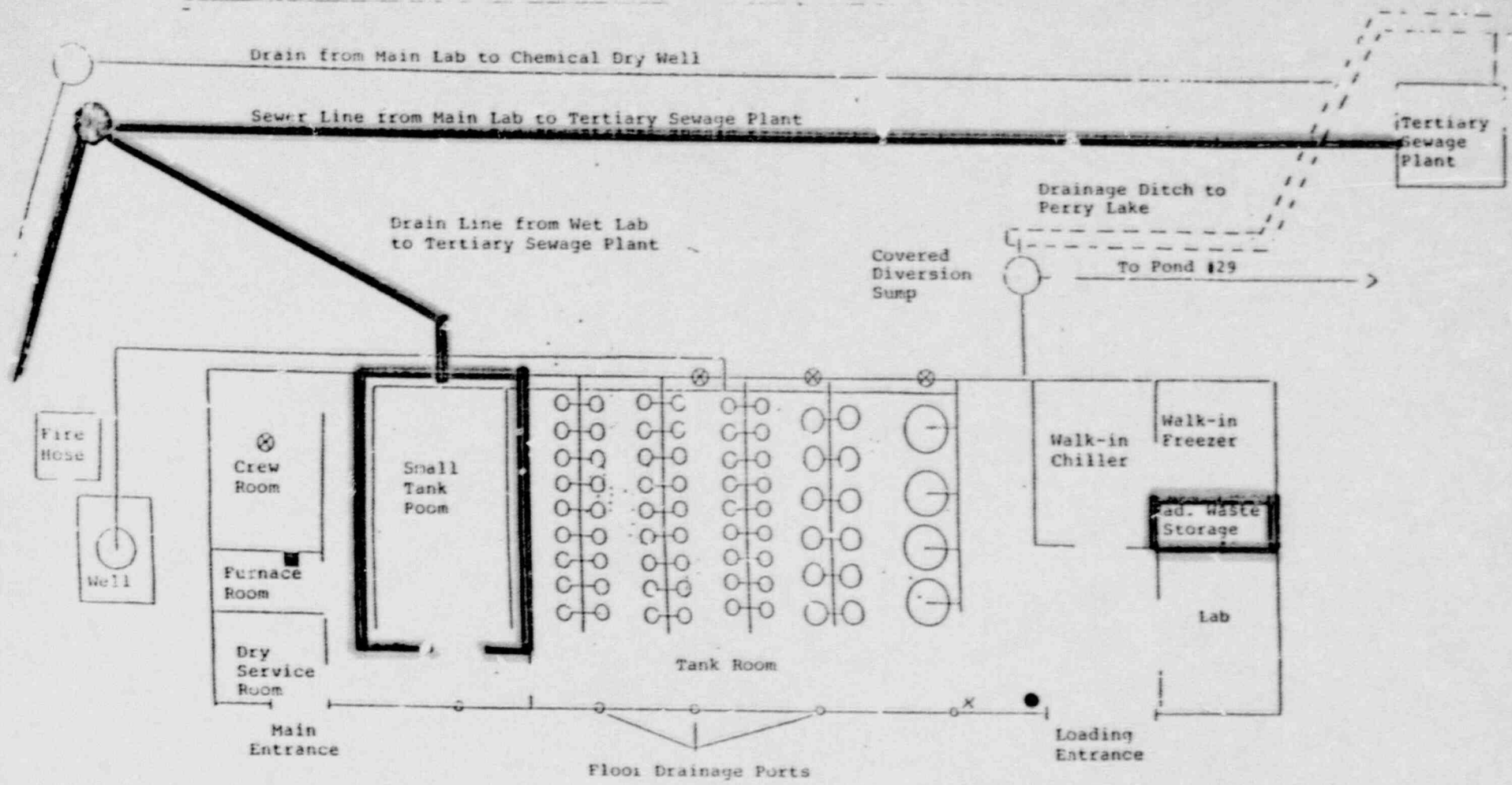
Attachment 2

- - Fire Extinguisher
- ⊗ - Exhaust fan
- - Safety Shower with Floor Drain
- - Sink
- X - Eye Wash Station



FLOOR PLAN S FCL MAIN LABORATORY

- Radionuclide Use Area
- >--- Evacuation Routes
- - Main Power Switch



- - Fire Extinguisher
- ⊗ - Exhaust fan
- x - Eyewash Station

- ▬** - Radionuclide Use Area
- - Main Power Switch

SEFCL WET LAB FLOOR PLAN

Attachment 3

VII. Radioactive Materials: Employee Safety Responsibilities

A. Use

The use of radioactive material is restricted to qualified personnel only, as determined by the Safety Committee. The NRC license (# 01-10058-02) lists the supervisors who can work with radioisotopes. Technicians using radioisotopes under the direction of a qualified supervisor will be given instructions for the proper handling of radioactive material.

1. Film badges are provided for personnel handling radioisotopes and are read quarterly. They should be worn during preparation, use, and disposal of radioactive materials.
2. The use of radioisotopes is restricted to specific marked areas of the laboratories. These areas are yellow on the attached floor plans (Appendices 6-8). The primary concern is containment of radioactive materials. The use of radioactive material outside the designated areas will be decided by the Safety Committee.
3. Individuals wanting to purchase radionuclides should submit their request to the Radiation Safety Officer.

B. Storage

1. Radioactive materials are stored in Closet #1 in the Chemical Storage Room or in the designated refrigerator in the Chemistry Lab. Concentrated solutions and dilute solutions of high-energy emitters (gamma emitters) are stored only in the closet. Concentrated and dilute solutions of beta emitters (^{14}C , ^{45}Ca) can be kept in the closet or the refrigerator. Radioactive compounds are not to be stored in any other room unless approved by the Safety Committee.
2. All radioactive material containers must have a label giving isotope, activity, and carrier solvent.

C. Handling

1. Wear a lab coat or apron, gloves, and eye protection when handling radioactive material or contaminated tissues, feed, or water regardless of activity or concentration.

2. Handle chemicals in plastic or stainless steel trays lined with absorbent paper. When the use of trays is not practical, cover the work area with absorbent paper.

D. Disposal

1. Following sample preparation, place absorbent paper, gloves, and other contaminated burnable material in designated waste cans with plastic liners. Wash the work area with soap and water and rinse with an appropriate solvent. Have the Radiation Safety Officer do swab tests to determine if any radioactivity remains. Repeat until the area is clean.
2. Soak contaminated glassware and other washable materials in a decontaminating solution before washing. Dishwashing is restricted to the sink in the Chemical Storage Room.
3. Place contaminated broken glass and highly contaminated non-burnable material in the marked garbage can for disposal.
4. Freeze contaminated tissues and other biological materials in the designated container in the walk-in freezer in the Wet Lab or in the refrigerator-freezer in the Chemistry Lab.
5. Discharge liquid wastes such as dilute radioactive samples resulting from tissue analysis directly into the sewer system in accordance with the NRC regulation Title 10, part 20, number 20.303 titled "Disposal by release into sanitary sewage systems".
6. Each supervisor using radionuclides should report to the Radiation Safety Officer the amount of isotope used, the area of the lab in which it was used, the date and method of use and disposal, and the project in which it was used. Forms are available from the Radiation Safety Officer.

F. Duties of the Radiation Safety Officer

The Station Safety Officer also serves as the Radiation Safety Officer if he/she has completed the required training. Otherwise, the Scientific Director will appoint a staff member who has had adequate training in radionuclide use to serve as the Radiation Safety Officer. The duties of the Radiation Safety Officer are to:

1. Order radioactive chemicals requested by researchers.
2. Open incoming radioactive material and log pertinent data. Rinse the outside of the vial with an appropriate solvent and check the washings for radioactivity using the liquid scintillation counter for beta emitters and the well counter for gamma emitters.
3. Using survey instruments or swab tests, conduct a survey of sample preparation and use areas following clean-up to determine if any activity remains.
4. Arrange for proper disposal of all classes of radioactive waste materials.
5. Control access to radioactive materials.
6. Enforce the use of proper personal protection and the proper storage and handling of radionuclides.
7. Maintain accurate records of incoming radionuclides, use and disposal, results of radiation surveys, and personal exposure.
8. Inform radiation workers of any new NRC regulations which directly affect them.
9. Clean up radioactive material spills.
10. Arrange for calibration of survey instruments as required by the NRC license.

E. Southeastern Fish Cultural Laboratory Radiation Safety Rules

The following rules are posted in each area designated for radionuclide use. Anyone handling radioactive materials should know these rules:

1. Keep work areas clean and neat.
2. Read and obey all warning signs and labels.
3. Wear lab coats or aprons and gloves whenever contamination is likely. Do not remove protective clothing from the area of use. Take special precautions to protect open wounds from contamination.
4. Do not eat, drink, smoke, or apply cosmetics in areas where radioactive materials are in use.
5. Do not pipet by mouth. Use an automatic pipet or other pipetting aid.
6. Plan work with safety in mind. Know the location and proper use of safety showers, fire extinguishers, and other emergency first aid equipment.
7. Use fume hoods and exhaust fans when handling volatile, gaseous, or dusty material.
8. Wear eye protection whenever required.
9. Personal exposure monitoring badges are to be worn in any area where there is potential radiation exposure.
10. Plainly identify and label all radioactive materials. Return all radiation sources to their designated storage areas following use.
11. Do not remove radioactive materials from designated areas without prior approval.
12. Radiation and contamination monitoring of work areas is required after completion of each experiment involving radionuclides. Have the Radiation Safety Officer conduct surveys to determine if the area is free of contamination.

13. Report all personal injuries and accidents to the Radiation Safety Officer. All cuts, wounds, or other injuries should receive immediate attention.
14. Do not dispose of radioactive wastes or contaminated articles in ordinary containers. Place such wastes in designated containers for disposal by approved methods.



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA STREET, N.W.
ATLANTA, GEORGIA 30323

JUN 14 1989

Department of the Interior
ATTN: Mary Anna Davis
Biological Technician
Fish and Wildlife Service
Route 3, Box 86
Marion, AL 36756

Docket No. 030-14829
License No. 01-10058-02
Control No. 252848

Gentlemen:

SUBJECT: LICENSE RENEWAL APPLICATION

This is to acknowledge receipt of your application for renewal of the nuclear material 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 your renewal application should reference the control number and license number specified above.

Sincerely,

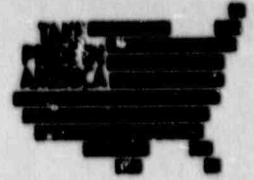
Earl S. Wright
Nuclear Materials Safety Section
Division of Radiation Safety
and Safeguards



United States Department of the Interior
FISH AND WILDLIFE SERVICE

Southeastern Fish Cultural Laboratory
Route 3, Box 86
Marion, Alabama 36756

29 May 1989



U.S. Nuclear Regulatory Commission
Region II
Nuclear Materials Safety Section
101 Marietta Street, Suite 2900
Atlanta, GA 30323

Dear Sirs:

Please find enclosed 2 copies of completed NRC Form 313 as application for renewal of Byproduct Material License No. 01-10058-02 which will expire June 30, 1989. The above license is issued to Southeastern Fish Cultural Laboratory, U.S. Fish and Wildlife Service, in Marion, Alabama.

If there are questions about the application or if additional information is required, please contact me at (205) 683-6175.

Sincerely,

Mary Anna Davis (Fisheries)
Biological Technician
Radiation Safety Officer

Enclosures:

APPLICATION FOR MATERIAL LICENSE

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.

<p>APPLICATIONS FOR DISTRIBUTION OF EXEMPT PRODUCTS FILE APPLICATIONS WITH:</p> <p>U.S. NUCLEAR REGULATORY COMMISSION DIVISION OF FUEL CYCLE AND MATERIAL SAFETY, NMSS WASHINGTON, DC 20546</p> <p>ALL OTHER PERSONS FILE APPLICATIONS AS FOLLOWS, IF YOU ARE LOCATED IN:</p> <p>CONNECTICUT, DELAWARE, DISTRICT OF COLUMBIA, MAINE, MARYLAND, MASSACHUSETTS, NEW HAMPSHIRE, NEW JERSEY, NEW YORK, PENNSYLVANIA, RHODE ISLAND, OR VERMONT, SEND APPLICATIONS TO:</p> <p>U.S. NUCLEAR REGULATORY COMMISSION, REGION I NUCLEAR MATERIALS SAFETY SECTION 6 475 ALLENDALE ROAD KING OF PRUSSIA, PA 19406</p> <p>ALABAMA, FLORIDA, GEORGIA, KENTUCKY, MISSISSIPPI, NORTH CAROLINA, PUERTO RICO, SOUTH CAROLINA, TENNESSEE, VIRGINIA, VIRGIN ISLANDS, OR WEST VIRGINIA, SEND APPLICATIONS TO:</p> <p>U.S. NUCLEAR REGULATORY COMMISSION, REGION II NUCLEAR MATERIALS SAFETY SECTION 101 MARIETTA STREET, SUITE 2900 ATLANTA, GA 30323</p>	<p>IF YOU ARE LOCATED IN:</p> <p>ILLINOIS, INDIANA, IOWA, MICHIGAN, MINNESOTA, MISSOURI, OHIO, OR WISCONSIN, SEND APPLICATIONS TO:</p> <p>U.S. NUCLEAR REGULATORY COMMISSION, REGION III MATERIALS LICENSING SECTION 799 ROOSEVELT ROAD GLEN ELLYN, IL 60137</p> <p>ARKANSAS, COLORADO, IDAHO, KANSAS, LOUISIANA, MONTANA, NEBRASKA, NEW MEXICO, NORTH DAKOTA, OKLAHOMA, SOUTH DAKOTA, TEXAS, UTAH, OR WYOMING, SEND APPLICATIONS TO:</p> <p>U.S. NUCLEAR REGULATORY COMMISSION, REGION IV MATERIAL RADIATION PROTECTION SECTION 611 RYAN PLAZA DRIVE, SUITE 1000 ARLINGTON, TX 76011</p> <p>ALASKA, ARIZONA, CALIFORNIA, HAWAII, NEVADA, OREGON, WASHINGTON, AND U.S. TERRITORIES AND POSSESSIONS IN THE PACIFIC, SEND APPLICATIONS TO:</p> <p>U.S. NUCLEAR REGULATORY COMMISSION, REGION V NUCLEAR MATERIALS SAFETY SECTION 1450 MARIA LANE, SUITE 210 WALNUT CREEK, CA 94596</p>
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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 JURISDICTION.

<p>1. THIS IS AN APPLICATION FOR (Check appropriate item):</p> <p><input type="checkbox"/> A. NEW LICENSE</p> <p><input type="checkbox"/> B. AMENDMENT TO LICENSE NUMBER _____</p> <p><input checked="" type="checkbox"/> C. RENEWAL OF LICENSE NUMBER <u>01-10058-02</u></p>	<p>2. NAME AND MAILING ADDRESS OF APPLICANT (Include Zip Code)</p> <p>U.S. Dept. of the Interior, Fish & Wildl. Serv., Southeastern Fish Cultural Laboratory Rt. 3 Box 86 Marion, AL 36756</p>
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3. ADDRESS(ES) WHERE LICENSED MATERIAL WILL BE USED OR POSSESSED

Southeastern Fish Cultural Laboratory
Rt. 3 Box 86
Marion, AL 36756

4. NAME OF PERSON TO BE CONTACTED ABOUT THIS APPLICATION	TELEPHONE NUMBER
Mary Anna Davis	(205) 683-6175

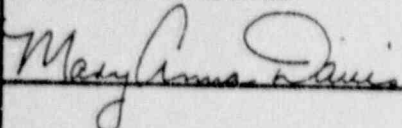
SUBMIT ITEMS 5 THROUGH 11 ON 8 1/2 x 11" PAPER. THE TYPE AND SCOPE OF INFORMATION TO BE PROVIDED IS DESCRIBED IN THE LICENSE APPLICATION GUIDE.

<p>5. RADIOACTIVE MATERIAL a. Element and mass number, b. chemical end/or physical form, and c. maximum amount which will be possessed at any one time.</p>	<p>6. PURPOSE(S) FOR WHICH LICENSED MATERIAL WILL BE USED.</p>				
<p>7. INDIVIDUAL(S) RESPONSIBLE FOR RADIATION SAFETY PROGRAM AND THEIR TRAINING AND EXPERIENCE.</p>	<p>8. TRAINING FOR INDIVIDUALS WORKING IN OR FREQUENTING RESTRICTED AREAS.</p>				
<p>9. FACILITIES AND EQUIPMENT.</p>	<p>10. RADIATION SAFETY PROGRAM.</p>				
<p>11. WASTE MANAGEMENT.</p>	<p>12. LICENSEE FEES (See 10 CFR 170 and Section 170.31)</p> <table style="width: 100%;"> <tr> <td>FEE CATEGORY</td> <td>AMOUNT ENCLOSED \$</td> </tr> <tr> <td>3M</td> <td>Exempt</td> </tr> </table>	FEE CATEGORY	AMOUNT ENCLOSED \$	3M	Exempt
FEE CATEGORY	AMOUNT ENCLOSED \$				
3M	Exempt				

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, 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.

SIGNATURE—CERTIFYING OFFICER	TYPED/PRINTED NAME	TITLE	DATE
	Mary Anna Davis	Biological Technician Radiation Safety Officer	5-28-89

FOR NRC USE ONLY				APPROVED BY
TYPE OF FEE	FEE LOG	FEE CATEGORY	COMMENTS	
AMOUNT RECEIVED	CHECK NUMBER			
				DATE

5. Radioactive Material:

1. a. Hydrogen - 3
b. Pesticides and organic biochemicals such as amino acids, fatty acids, lipids, carbohydrates, vitamins, and salts.
c. 100 mCi
2. a. Carbon - 14
b. Pesticides and organic biochemicals such as amino acids, fatty acids, lipids, carbohydrates, vitamins, and salts.
c. 10 mCi
3. a. Iodine - 125
b. Iodide and labeled thyroxine, triiodothyronine, mono- and di-iodotyrosine, labeled proteins, and hormones.
c. 1 mCi
4. a. Phosphorus - 32
b. Phosphate ion and organophosphate insecticides.
c. 1 mCi
5. a. Calcium - 45
b. Calcium ion
c. 1 mCi
6. a. Sodium - 22
b. Labeled sodium as NaCl
c. 1 mCi
7. a. Radium - 26
b. Sealed source - Packard Instrument Co., Inc., Model PL Prias Liquid Scintillation Counter.
c. 20 μ Ci
8. a. Iodine - 129
b. Sealed source - Packard Instrument Co., Inc., Model CS301 Multi-Prias I Gamma Counter.
c. 0.03 μ Ci

6. Purposes for which licensed material will be used:

1. Hydrogen - 3
Tritiated organic biochemicals are used in studies of metabolic pathways and nutrition of fishes.
2. Carbon - 14
Carbon labeled pesticides are used for studies of residue uptake, storage, and release by aquatic organisms (ancillary method to chemical assay).
Carbon labeled biochemicals are used in studies of metabolic pathways and nutrition of fishes (ancillary method to chemical assay).
3. Iodine - 125
Radioiodine is used for studies of fish thyroid function and radioimmunoassays.
4. Phosphorus - 32
Radiophosphorus is used for studies of organophosphate insecticides, osmoregulation, and bone metabolism in fishes.
5. Calcium - 45
Labeled calcium is used for studies of osmoregulation, reproduction, and bone metabolism in fishes.
6. Sodium - 22
Labeled sodium is used to measure Na flux between an organism and water.
7. Radium - 226
External standard source in Prias Liquid Scintillation Counter.
8. Iodine - 129
Internal standard in Multi-Prias I Gamma Counter.

7. Individuals responsible for radiation safety program and their training and experience:

Mary Anna Davis - Biological Technician (Fisheries):

Training: Formal course "Radiation Safety Specialist Training Program" - 40 hrs. - Oklahoma State University, 1981

Related Training: Math, Chemistry, Physics - 32 sem. hrs.
Biology - 37 sem. hrs.

Experience: 10 years of low level (250 μ Ci maximum) radioisotope use in radioimmunoassays, competitive protein binding radioassay and metabolism studies.

Isotopes: 125I 3H 14C

Dr. Ken B. Davis - Physiologist

Training: Radiation worker - certified by Radiological Safety Office, Memphis State University, 8 hrs., March 1978.

Related Training: Math, Chemistry, Physics - 51 sem. hrs.
Biology - Approximately 100 sem. hrs.

Experience: 10 years of low level radioisotope use in competitive protein binding radioassay, radioimmunoassays, metabolism and osmoregulation studies.

Isotopes: 125I 3H 22Na

Pat Mazik Biology graduate student trainee

Training: No formal training. Has received on-the-job training from Mary Anna Davis and Dr. Ken Davis in the safe use, handling, and disposal of tracer levels of radionuclides for radioimmunoassay.

Related Training: Math, Chemistry, Physics - 30 qtr. hrs.,
14 sem. hrs.
Biology - 61 qtr. hrs., 53 sem. hrs.

Experience: 2 years of low level radioisotope use in radioimmunoassay procedures.

Isotopes: 125I

8. Training for individuals working in or frequenting restricted areas:

See Item 10. - Radiation Safety Program .

9. Facilities and Equipment

Radionuclide use areas are located in two of the main laboratory buildings on the property of Southeastern Fish Cultural Laboratory (see Attachment 1). The areas approved for use in the Main Laboratory are shown on the floor plan (Attachment 2). The room designated "Chem Lab 2" has a quarry tile floor and glazed tile walls, and is used for counting sealed samples. The area is restricted when samples are present and being processed. There are three closets with metal doors and exhaust fans (The one designated for radionuclide storage is labeled and locked); a sink work area; water and air; and floor drainage into the adjacent Chemistry Lab. The sink work area, when used for handling concentrated samples, is set up with secondary containers, trays with absorbent paper, lead bricks, hand-operated microliter pipettes and syringes, and containers and materials restricted for clean-up after initial handling of stock solutions. The Chemistry, Physiology, and Biology labs, constructed with quarry tile floors and glazed tile walls, are used for sample preparation. These labs are equipped with ceiling exhaust fans, emergency showers, floor drains, metal storage cabinets, chemical sinks, and fume hoods. They are supplied with domestic water, deionized water, air, gas, vacuum, and electricity. These areas are restricted when samples are present or being processed. Standard and ultramicro analytical equipment such as balances, glassware, Lang-Levy pipettes, Hamilton syringes, sample containers, etc. are used, with proper containment in trays lined with absorbent paper, for sample processing. Containers and facilities for decontamination and washing labware are reserved in these labs for clean-up after sample processing.

Our radiometric equipment presently consists of a Baird-Atomic Model 420 G.M. Survey Meter, Packard PRIAS PL liquid scintillation counter, and a Packard Multi-PRIAS I, Model C5301 gamma counter (specifications follow). Samples are transported in sealed vials or tubes from preparation areas to the Chem Lab 2 for counting. Associated materials such as fluors, dispersants, vials and tubes for sample preparation and counting are stored in the Chemistry Lab. Non-radiometric equipment to be used in procedures requiring radionuclides consists of conventional instrumentation used in clinical and analytical chemistry such as gas-liquid and high pressure-liquid chromatographs, spectrophotometers, fluorescence spectrometer, etc., as well as other equipment such as centrifuges, tissue sectioning equipment, hematology equipment, microscopes, diet preparation facilities, etc. The lab also has materials and equipment for autoradiography of tissue sections and thin-layer chromatograms.

A "wet laboratory" (Attachment 3) situated adjacent to the main building is used for exposing or dosing test fishes and various invertebrates with radiolabeled compounds. A small isolation tank room has flow-through glass aquaria and static polyethylene tanks with covers for contact exposures or dosing by diet, and the floor and walls are concrete. It has enclosed drainage from tanks and aquaria to a tertiary sewage plant or to an outdoor sump that diverts non-contaminated waste water to a drainage ditch. Aerated artesian water is pumped to the wet lab continuously at over 140,000 gal/day and it can be increased to over 300,000 gal/day when necessary. The tank room has carts, trays, an autopsy area, dip nets, and miscellaneous containers for decontamination and containment of hot materials. The tank room has lockable metal doors and is designated as a restricted area when radionuclides are present.

Radiometric Equipment

Type - Baird-Atomic Model 420 G.M. Survey Meter
Number available - 1
Radiation detected - Beta, gamma
Sensitivity range - 0-100
Window thickness - 1.4
Use - Monitoring

Type - Packard PRIAS, Model PL Liquid Scintillation Counter
Number available - 1
Radiation detected - Beta, gamma (low energy)
Use - Measuring

Type - Packard Multi-PRIAS 1, Model C5301 Gamma Counter
Number available - 1
Radiation detected - gamma
Use - Measuring

Instrument Calibration

A sealed source on the instrument case of the Model 420 survey meter is used for checks for nominal responses of each scale: 0.43 ± 0.01 , 0.44 ± 0.01 , and 0.45 ± 0.01 mR/hr ($X \pm A$, $n=10$) at 0, 37, and 140 mm from the source, respectively (taken after December 1988 factory calibration). Batteries are replaced or high voltage adjustments are made if appreciable deviation from 900 v occurs between intervals of calibration. If deviations greater than 10% of the above rates occur and cannot be corrected by voltage adjustment, the unit is sent to the manufacturer for re-calibration as required.

Unquenched standards (purged with an inert gas and flame sealed) of tritium ($346K$ dpm \pm 1.56%, May 1977), ^{14}C ($99.1K$ \pm 1.03%, May 1977) and "background" standard (Packard, Cat. No. 6008400, Ser.# 199) are used for precision and accuracy tests when

the liquid scintillation counter is in use. Indicated malfunctions (greater than 10% deviation from the mean) are to be corrected by manufacturer's service on an as-needed basis. These readings are used to monitor instrument performance and confirm discriminator settings. The background standard is used to detect the presence of or changes in environmental radiation contamination and electronic noise.

Performance of the Multi-PRIAS gamma counter is verified with an integral quality control program which contains detector correlation, Chi-square, and background measurement routines. Acceptable values indicating proper operation are specified in the manual and deviations from these values are corrected by manufacturer's service. The unit automatically calibrates when not in use, adjusting the detector voltage to compensate for temperature and photomultiplier tube aging.

10. Radiation Safety Program

The intent of the laboratory's radiation protection plan is to provide protection to human health and property while using the powerful but potentially hazardous research tool radiometry provides, assuming that effects of any ionizing radiation are cumulative and potentially dangerous. The protocol to be followed provides for proper storage of concentrated stocks, samples to be analyzed, and wastes of sample workup; containment at each step of radionuclide handling, with monitoring for spills, leaks, and possible loss through aerosols, vapors, etc.; clean up and decontamination; accurate dose monitoring with prescribed posting of restricted areas and staff training; and emergency procedures when fires, explosions, or other emergencies potentiate a radiation hazard. A primary restriction in the lab's use of by-product material is to judge from precedents in available techniques and from pilot studies the minimal amount of radioactivity necessary to accomplish a procedure and to use no greater than that amount. A major part of this approach is to maximize procedure efficiency and instrument performance, and use the most sensitive detection available.

Before work with a radionuclide is begun, a detailed study plan is prepared to anticipate and resolve any likely problems. Each such plan details ordering and storing the by-product material, setting up all necessary equipment for handling and administering the material, collecting material for sample preparation, accounting for all residual materials, and storage and final disposal of various forms of waste.

When an order of by-product material arrives, its assay information is logged, the sealed container is opened, tests for

leakage of the primary container are performed, and the conditions are corrected if necessary before storage. Concentrated stocks are stored in a half-inch-thick lead container set inside a secondary vessel. Only chemically stable solutions of materials are to be used at the laboratory, e.g. ^{125}I in basic solution with or without stable isotope carrier. No labeled compounds that are labile at room temperature are to be used. If refrigeration is necessary, dilute preparations with proper lead shielding are stored in the refrigerator in the Chemistry Lab. Small volumes of concentrated stock are adjusted to correct volumes and made up in the necessary form for working solution, i.e. added buffer, etc., in trays lined with absorbent paper in secondary vessels to insure containment. Anyone handling radioactive material uses hand operated pipettes or syringes and wears surgical rubber gloves, a cotton lab coat, and a film badge. The working area in Chem Lab 2 is used for making up working solutions (20 μc or less) and for clean up afterwards. The storage closet is posted "Caution - Radioisotope Storage", the door is locked, and access is under user supervision. The other restricted areas are posted "Caution - Radiation Area". Film badges are worn in the restricted areas and a record of radiation exposure is kept. Film badges are supplied and read quarterly by United States Testing Company, Inc., 2800 George Washington Way, Richland Washington 99352. Records of background radiation at specific sites in restricted areas are kept for comparison with readings for suspected or known spills or inadvertent contamination. The survey meter's use is supplemented with spot check washes for tests with more sensitive detectors.

A copy of the Radioactive Materials section of the Station Safety Plan is included here (Attachment 4). The section includes employee responsibilities for the safe use, storage, handling and disposal of radioactive materials; duties of the Radiation Safety Officer; and laboratory safety rules which are posted in all areas approved for radionuclide use.

11. Waste Management

Liquid scintillation media containing tracer levels of ^3H and ^{14}C is disposed of in accordance with 10CFR 20.303 and 10CFR 20.306. After being counted, the media is poured into open containers which are placed in a fume hood or under an exhaust fan. The volatile constituents of the cocktail are evaporated and the residue is released to the sanitary sewage system. Vials are soaked in a decontaminating solution for 24 hours. Residual activity is measured on a sample of the vials, and if the counts are comparable to background counts as determined using new vials and cocktail only, vials are disposed of as regular garbage. If residual counts are at least twice background, the decontamination procedure is repeated until counts are acceptable.

Assay tubes containing tracer levels of ^{125}I are held in the Chem Lab 2 until residual radioactivity is comparable to background counts using new vials. When background levels are reached, tubes are disposed of as regular garbage.

A commercial firm has been contracted to supply waste disposal service for radioactive wastes other than the types mentioned above. The address of this NRC licensed firm is as follows:

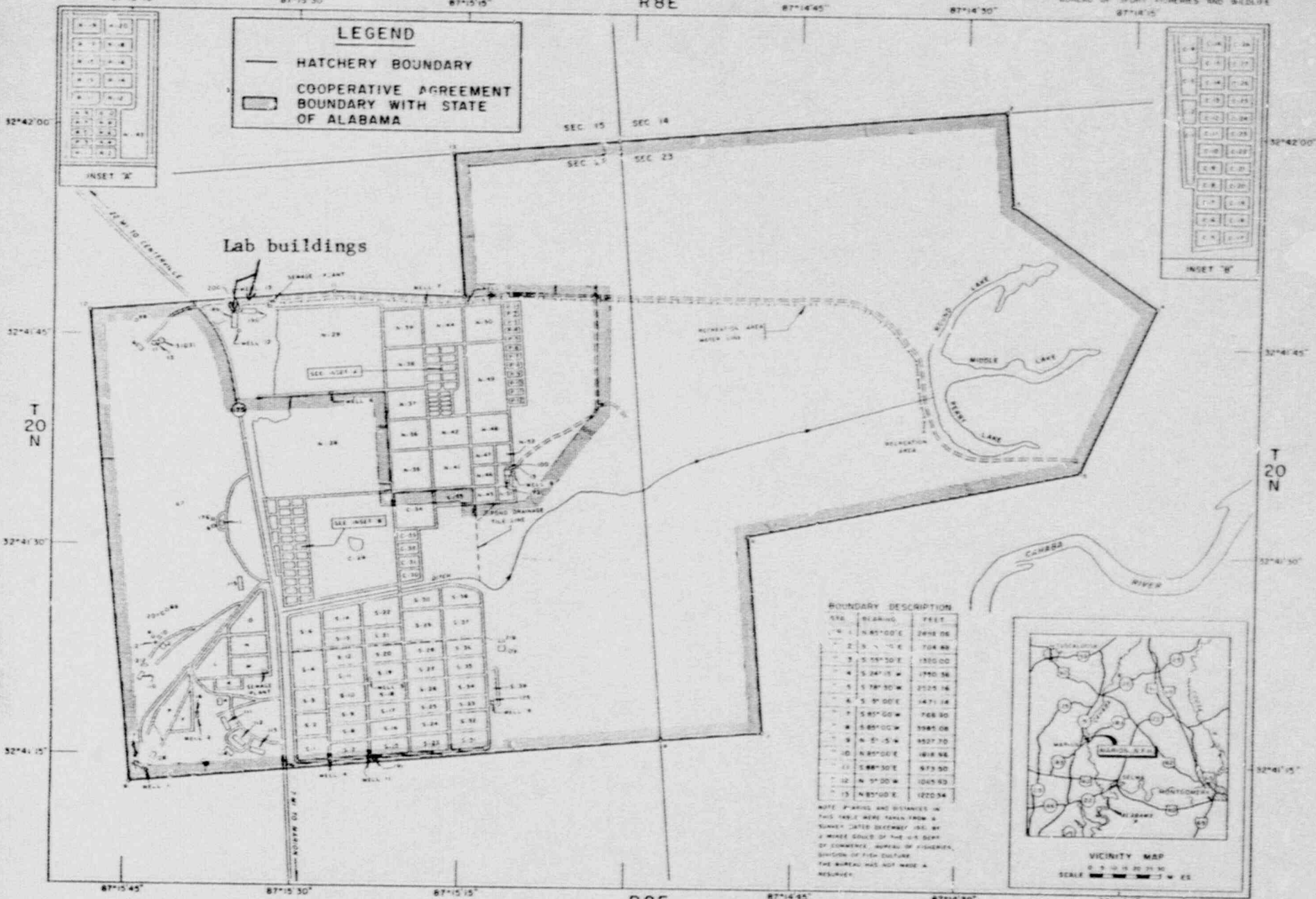
Chem-Nuclear Systems, Inc.
P.O. Box 726
Osborn Road
Barnwell, S.C. 29812
Phone (803) 259-1781

MARION NATIONAL FISH HATCHERY

PERRY COUNTY, ALABAMA

UNITED STATES
DEPARTMENT OF THE INTERIOR
87°15'45"

FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE
87°14'15"



32°42'00"

32°41'45"

32°41'30"

32°41'15"

32°42'00"

32°41'45"

32°41'30"

32°41'15"

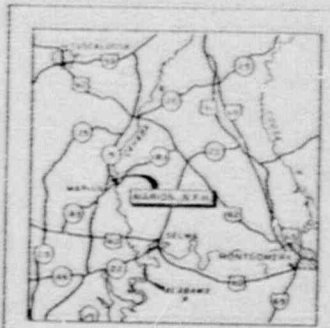
LEGEND

- HATCHERY BOUNDARY
- ▭ COOPERATIVE AGREEMENT BOUNDARY WITH STATE OF ALABAMA

BOUNDARY DESCRIPTION

STA.	BEARING	FEET
1	N 85°00' E	249.06
2	S 77°15' E	704.89
3	S 55°30' E	180.00
4	S 24°15' W	1790.56
5	S 78°30' W	2124.74
6	S 9°00' E	1471.14
7	S 85°00' W	768.30
8	S 88°00' W	1985.08
9	N 5°15' W	1827.70
10	N 85°00' E	1618.54
11	S 88°30' E	873.50
12	N 9°00' W	1045.93
13	N 85°00' E	1220.34

NOTE: BEARINGS AND DISTANCES IN THIS TABLE WERE TAKEN FROM A SURVEY DATED DECEMBER 1961 BY J. W. HARRIS, SURVEYOR, U.S. DEPT. OF COMMERCE, BUREAU OF FISHERIES, DIVISION OF FISH CULTURE. THE BUREAU HAS NOT MADE A RE-SURVEY.



VICINITY MAP

SCALE 0 5 10 20 30 40 FEET

COMPILED IN THE DIVISION OF REALTY FROM SURVEYS BY B.S.F. & W., DEPT. OF COMMERCE, AND AERIAL PHOTOGRAPHS

ATLANTA, GEORGIA

APRIL, 1974

ST. STEPHENS MERIDIAN

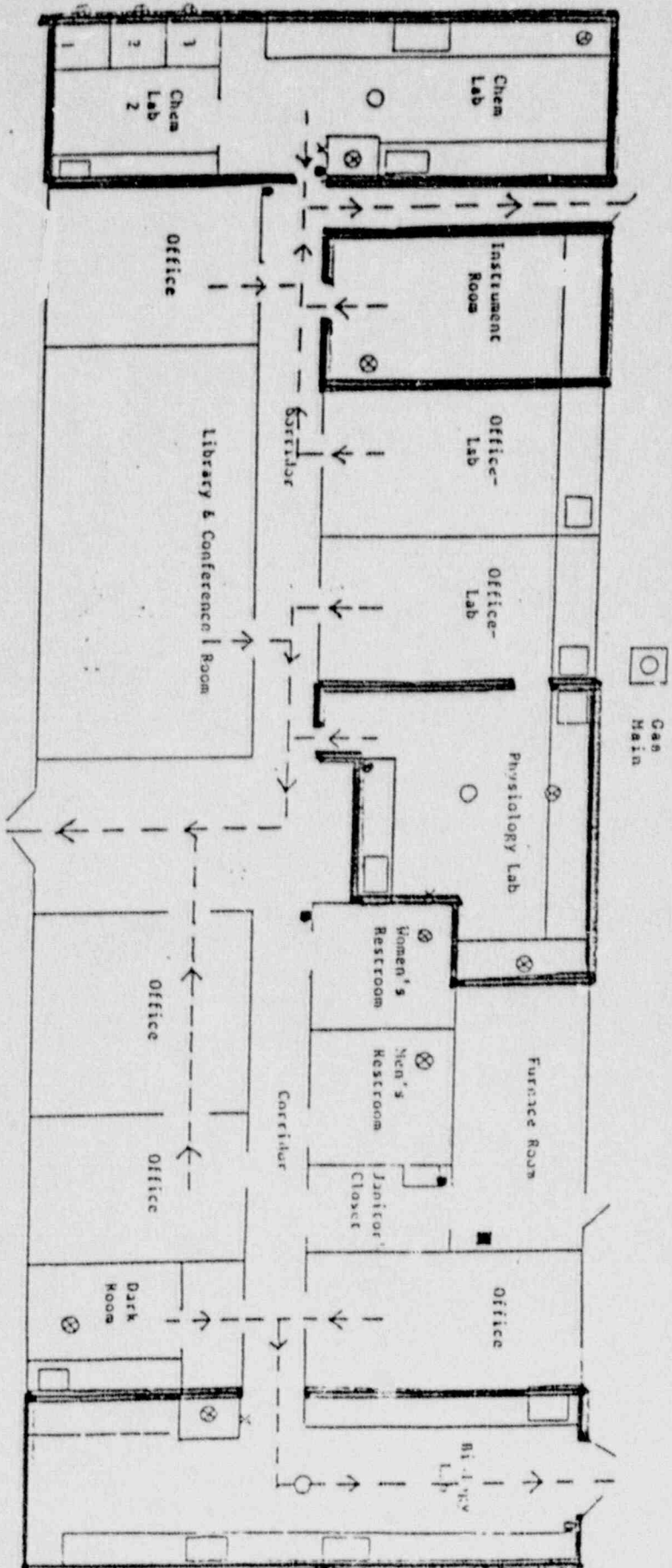
Scale 0 25 50 100 150 200 FEET

MEAN DECLINATION 1974

Attachment I

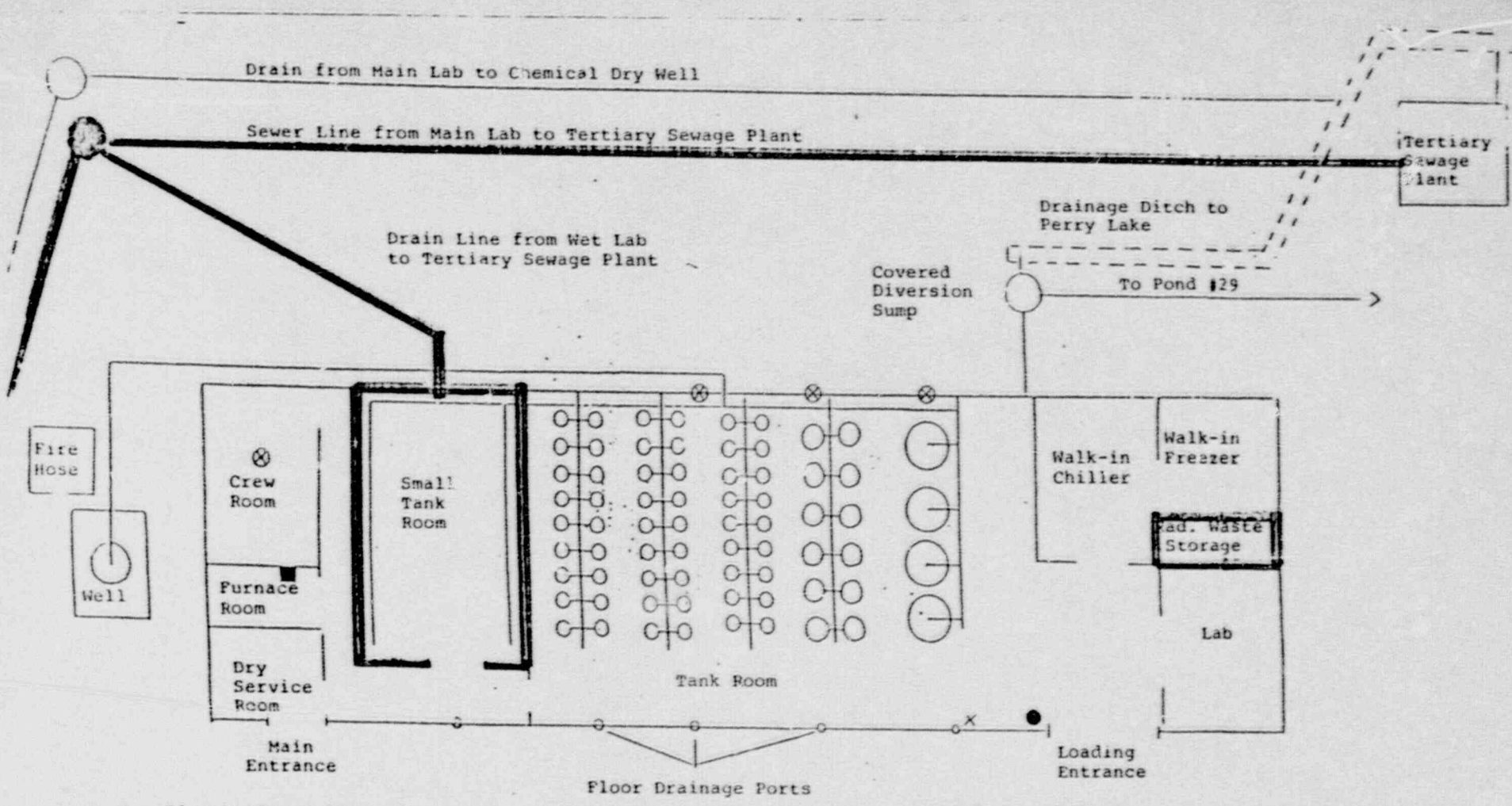
Attachment 2

- - Fire Extinguisher
- ⊗ - Exhauster fan
- - Safety Shower with Floor Drain
- - Sink
- X - Eye Wash Station



FLOOR PLAN SPECIAL MAIN LABORATORY

- Radionuclide Use Area
- - - - - Evacuation Routes
- - Main Power Switch



- - Fire Extinguisher
- ⊗ - Exhaust Fan
- x - Eyewash Station

- ▬ - Radionuclide Use Area
- - Main Power Switch

SEFCL WET LAB FLOOR PLAN

Attachment 3

VII. Radioactive Materials: Employee Safety Responsibilities

A. Use

The use of radioactive material is restricted to qualified personnel only, as determined by the Safety Committee. The NRC license (# 01-10058-02) lists the supervisors who can work with radioisotopes. Technicians using radioisotopes under the direction of a qualified supervisor will be given instructions for the proper handling of radioactive material.

1. Film badges are provided for personnel handling radioisotopes and are read quarterly. They should be worn during preparation, use, and disposal of radioactive materials.
2. The use of radioisotopes is restricted to specific marked areas of the laboratories. These areas are yellow on the attached floor plans (Appendices 6-8). The primary concern is containment of radioactive materials. The use of radioactive material outside the designated areas will be decided by the Safety Committee.
3. Individuals wanting to purchase radionuclides should submit their request to the Radiation Safety Officer.

B. Storage

1. Radioactive materials are stored in Closet #1 in the Chemical Storage Room or in the designated refrigerator in the Chemistry Lab. Concentrated solutions and dilute solutions of high-energy emitters (gamma emitters) are stored only in the closet. Concentrated and dilute solutions of beta emitters (^{14}C , ^{45}Ca) can be kept in the closet or the refrigerator. Radioactive compounds are not to be stored in any other room unless approved by the Safety Committee.
2. All radioactive material containers must have a label giving isotope, activity, and carrier solvent.

C. Handling

1. Wear a lab coat or apron, gloves, and eye protection when handling radioactive material or contaminated tissues, feed, or water regardless of activity or concentration.

2. Handle chemicals in plastic or stainless steel trays lined with absorbent paper. When the use of trays is not practical, cover the work area with absorbent paper.

D. Disposal

1. Following sample preparation, place absorbent paper, gloves, and other contaminated burnable material in designated waste cans with plastic liners. Wash the work area with soap and water and rinse with an appropriate solvent. Have the Radiation Safety Officer do swab tests to determine if any radioactivity remains. Repeat until the area is clean.
2. Soak contaminated glassware and other washable materials in a decontaminating solution before washing. Dishwashing is restricted to the sink in the Chemical Storage Room.
3. Place contaminated broken glass and highly contaminated non-burnable material in the marked garbage can for disposal.
4. Freeze contaminated tissues and other biological materials in the designated container in the walk-in freezer in the Wet Lab or in the refrigerator-freezer in the Chemistry Lab.
5. Discharge liquid wastes such as dilute radioactive samples resulting from tissue analysis directly into the sewer system in accordance with the NRC regulation Title 10, part 20, number 20.303 titled "Disposal by release into sanitary sewage systems".
6. Each supervisor using radionuclides should report to the Radiation Safety Officer the amount of isotope used, the area of the lab in which it was used, the date and method of use and disposal, and the project in which it was used. Forms are available from the Radiation Safety Officer.

F. Duties of the Radiation Safety Officer

The Station Safety Officer also serves as the Radiation Safety Officer if he/she has completed the required training. Otherwise, the Scientific Director will appoint a staff member who has had adequate training in radionuclide use to serve as the Radiation Safety Officer. The duties of the Radiation Safety Officer are to:

1. Order radioactive chemicals requested by researchers.
2. Open incoming radioactive material and log pertinent data. Rinse the outside of the vial with an appropriate solvent and check the washings for radioactivity using the liquid scintillation counter for beta emitters and the well counter for gamma emitters.
3. Using survey instruments or swab tests, conduct a survey of sample preparation and use areas following clean-up to determine if any activity remains.
4. Arrange for proper disposal of all classes of radioactive waste materials.
5. Control access to radioactive materials.
6. Enforce the use of proper personal protection and the proper storage and handling of radionuclides.
7. Maintain accurate records of incoming radionuclides, use and disposal, results of radiation surveys, and personal exposure.
8. Inform radiation workers of any new NRC regulations which directly affect them.
9. Clean up radioactive material spills.
10. Arrange for calibration of survey instruments as required by the NRC license.

E. Southeastern Fish Cultural Laboratory Radiation Safety Rules

The following rules are posted in each area designated for radionuclide use. Anyone handling radioactive materials should know these rules:

1. Keep work areas clean and neat.
2. Read and obey all warning signs and labels.
3. Wear lab coats or aprons and gloves whenever contamination is likely. Do not remove protective clothing from the area of use. Take special precautions to protect open wounds from contamination.
4. Do not eat, drink, smoke, or apply cosmetics in areas where radioactive materials are in use.
5. Do not pipet by mouth. Use an automatic pipet or other pipetting aid.
6. Plan work with safety in mind. Know the location and proper use of safety showers, fire extinguishers, and other emergency first aid equipment.
7. Use fume hoods and exhaust fans when handling volatile, gaseous, or dusty material.
8. Wear eye protection whenever required.
9. Personal exposure monitoring badges are to be worn in any area where there is potential radiation exposure.
10. Plainly identify and label all radioactive materials. Return all radiation sources to their designated storage areas following use.
11. Do not remove radioactive materials from designated areas without prior approval.
12. Radiation and contamination monitoring of work areas is required after completion of each experiment involving radionuclides. Have the Radiation Safety Officer conduct surveys to determine if the area is free of contamination.

13. Report all personal injuries and accidents to the Radiation Safety Officer. All cuts, wounds, or other injuries should receive immediate attention.
14. Do not dispose of radioactive wastes or contaminated articles in ordinary containers. Place such waste in designated containers for disposal by approved methods.