030-19526

JUL 30 1994

License No. 29-19918-01
Docket No. 030-19526
Control No. 114548

The Liposome Company, Incorporated
ATTN: Lee Buccheri
Radiation Safety Officer
Princeton Forrestal Center
1 Research Way
Princeton, New Jersey 08540

Dear Ms. Buccheri:

Subject: Financial Assurance

This is in reference to your submittals dated March 18, 1991 with attached Decommissioning Funding Plan, Letter of Credit dated July 15, 1994 and letter dated July 19, 1994 with revised Decommissioning Funding Plan and Standby Trust Agreement to establish financial assurance for NRC License No. 29-19918-01. We have reviewed your submittals and within the scope of our review, no further deficiencies were identified.

Based on our review of your submittals, you are presently in compliance with the requirements of 10 CFR 30.35. Please note that financial assurance certification and all associated documentation are required to be updated with significant changes in your operation and with each application for license renewal.

If you have any questions regarding this letter, please call David Everhart of this office at (610) 337- 6936. Thank you for your cooperation in this matter.

Sincerely,

Original Signed By:
Mohamed M. Shanbaky

Mohamed M. Shanbaky, Chief
Research and Development Section
Division of Radiation Safety
and Safeguards

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bcc:
M. Shanbaky, RI
D. Everhart, RI

DRSS:RI
Everhart

7/21/94

DRSS:RI
Shanbaky

7/27/94

THE LIPOSOME COMPANY, INC.

MS 16
K-2

030-19526

July 19, 1994

Mr. Mohamed M. Shanbaky, Chief
U.S. Nuclear Regulatory Commission
Region I
Mail Control No. 114548
475 Allendale Road
King of Prussia, PA 19406

Re: Response to letter dated March 15, 1994
Submission of Decommissioning Funding
Plan for U.S. NRC License No. 29-19918-01

Dear Mr. Shanbaky:

In response to the above referenced letter, we have revised our Decommissioning Funding Plan to incorporate the requested items. Attached, please find the revised plan.

Items 1-3 of the letter are answered within the Plan in Sections 2.1.2, 3.1 and 5.0.
Item 4 has been addressed in Section 5.0.
Items 5 and 6 are addressed in Attachment E.

In addition, the cost estimate has been revised to reflect the changes that have been made.

If you have any questions, please do not hesitate to contact me.

Sincerely,

Lee Buccheri
Manager
Occupational Health & Safety

LB/md
Enclosure

114548

JUL 20 1994

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One Research Way Princeton Forrestal Center Princeton, New Jersey 08540-6619 (609) 452-7060 Telefax: (609) 452-1890

DECOMMISSIONING FUNDING PLAN

FOR

THE LIPOSOME COMPANY

U.S. NRC LICENSE NO. 29-19918-01

PREPARED BY

TELEDYNE
BROWN ENGINEERING
Environmental Services

Revised
June 1994

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Attachments:

Floor Plan of The Liposome Company ..... Diagram 1

Decontamination Procedure ..... Attachment A

Resumes:
Lee Buccheri, The Liposome Company ..... Attachment B
Steven A. Black, Teledyne Isotopes ..... Attachment C

Teledyne Isotopes RSC&QCM Pertinent Sections ..... Attachment D

Funding Documentation ..... Attachment E

Decommissioning Cost Estimate ..... Attachment F

Individual Room/Area Diagrams ..... Attachment G

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1.0 General Information & Overview

The Liposome Company
1 Research Way
Princeton Forrestal Center
Princeton, New Jersey 08540

U.S. NRC License No. 29-19918-01

Contact: Lee Buccheri
Phone: 609-452-7061

This document includes 1) a discussion of the site history and expected methods for performing the decommissioning of the facility; 2) a site-specific cost estimate for the decommissioning of the facility; 3) a description of the methods used to assure that there are adequate funds available for the decommissioning of the facility; and 4) a description of the methods that will be used to adjust the site-specific decommissioning cost estimate at periodic time intervals.

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2.0 Description of the Planned Decommissioning Activities

2.1 Decommissioning Objectives, Activities, Tasks, & Schedules

2.1.1 Decommissioning Objectives & Activities

The objective is to reduce radioactive contamination levels to below those specified in the U.S. Nuclear Regulatory Commission document entitled "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct, Source, or Special Nuclear Material", dated July 1982.

The Activities to be performed include the following:

1) Final update and review of the Decommissioning Plan

2) Disposal of any accumulated radioactive waste.

3) A preliminary survey to determine the extent of residual activity.

4) Decontamination, dismantling, demolition and/or packaging of contaminated objects & wastes from decontamination activities.

5) Disposal of any items which cannot be decontaminated and any waste produced from decommissioning activities.

6) A final survey for compliance with the above referenced document.

2.1.2 Description

The Liposome Company is a biotechnology company dedicated to the development of liposome based pharmaceuticals. The primary focus is developing advanced liposomal drugs for treatment of cancer and serious infectious disease. Radioisotopes have been utilized for ten years in bio-distribution studies and to determine the per cent of liposomal entrapment. Monthly radiation surveys as of the date of this plan indicate minimal contamination of equipment and none to the facility. Diagrams of the monthly surveys are shown in Attachment G. Radioisotopes are not disposed to the sanitary sewer and volatile compounds have only been used once. In addition to the monthly surveys that are done, a survey was done prior to preparing this plan that verified the monthly survey results. The drain traps were also sampled during this survey and the results were negative. Although the fume hood ductwork was not sampled, there has never been any contamination within the hoods that would suggest contamination of the ductwork. Given the history of the facility, it is reasonable to assume that few, if any, difficulties will arise during the decommissioning activities. However, to cover the possibility of the contamination of facilities and equipment that was not detected during the survey that was done prior to preparing this plan, the equivalent of 1/2 of a basic laboratory's equipment (including sink drains and hood ductwork) is incorporated into the cost estimate.

2.1.3 Procedures

Based on the history of the site as described above, there seems little reason to expect any major contamination of the facility. The written procedures which will be used will be approved by the persons specified in Section 2.2 prior to the start of any hands-on Activities.

2.1.4 Schedules

The sequence of Activities is as follows:

1) Upon notification to proceed with the Decommissioning Plan, the persons specified in section 2.2 will determine if 1) the current Decommissioning Plan is still valid, 2) additional procedures will be written and approved, and 3) any additional training will be performed. Estimated time: 2 days.

2) Teledyne Isotopes will be on-site to perform Activities 2 & 3 within three weeks. Estimated time on-site: 3 days.

3) The results of the preliminary survey and a report should be processed within one month's time. At that time Activities 4 & 5 will commence. Estimated time on-site: 2 days. Areas of concern will be decontaminated according to the enclosed procedures. It will be assumed that 90% of the material can be decontaminated. The volume of waste generated from the decontamination will be estimated to be 5% of the initial volume of the area or object. Walls or floors which cannot be decontaminated will be excavated to an approximate depth of three inches. These materials will be disposed as radioactive waste.

4) Activity 6 will follow all demolition, dismantling and disposal operations. Estimated time on-site: 1 day.

5) The results of Activity 6 will be known and a final report prepared within one month of the completion of the survey. If the final survey indicates the need for additional decontamination, dismantling or disposal, then Activities 4, 5 and 6 will be repeated for the suspect areas.

2.2 Decommissioning Organization and Responsibilities

The person responsible for supervising the Decommissioning Plan is Lee Buccheri. She will be assisted by Steven A. Black of Teledyne Isotopes. Resumes can be found as Attachments B and C. They will be responsible for every aspect of the Plan. If either of these persons are unavailable at the time of the decommissioning, persons with similar experience and qualifications will be used. Further personnel descriptions can be found in sections 2.3 Training and 2.4 Contractor Assistance.

2.3 Training

Teledyne Isotopes personnel have been trained in accordance with their Radiation Safety Code & Quality Control Manual. See Attachment D for copies of the pertinent sections. In addition, all personnel supplied by Teledyne Isotopes that will wear respirators, will have had respirator training. Included in this training is the use and care of full face air purifying respirators and Self-Contained Breathing Apparatus (SCBA). If any new procedures are developed for use during the Decommissioning Plan, personnel will be trained accordingly prior to the implementation of the new procedure.

2.4 Contractor Assistance

Throughout this Plan, The Liposome Company will rely on the expertise provided by Teledyne Isotopes. A team of one Health Physics supervisor and one Health Physics technician will be used for on-site work. Waste removal operations will be performed by a Radwaste Supervisor and a Health Physics technician.

All on-site operations will be conducted under The Liposome Company's U.S. NRC license and the off-site radwaste operations will be performed under Teledyne Isotopes U.S. NRC License No. 29-00055-14. Laboratory analyses and material handling other than radwaste will be conducted under Teledyne Isotopes U.S. NRC license No. 29-00055-06.

Contractor Information:

Teledyne Isotopes
50 Van Buren Avenue
Westwood, NJ 07675

Steven A. Black, R.S.O., Manager
201-664-7070 x225

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3.0 Description of Methods Used for the Protection of Occupational and Public Health and Safety

3.1 Facility Radiological History Information

As previously stated, monthly radiation surveys indicate no contamination of the facility and the only item found with fixed contamination was one laboratory scale. Most work with radioisotopes is conducted in lined trays to prevent contamination of the bench tops. Animals used in radioisotope studies are segregated from other animals. To date, there have only been a few minor spills of radioactive material. Each spill was less than 5 milliliters of a labeled solution and promptly cleaned.

Company policy prohibits the disposal of liquid radioactive material to the sanitary sewer. It is currently being stored and will be prepared for shipment to an approved processor for incineration. Preliminary surveys of the major-use hoods indicate that the hood ductwork is not contaminated and will not require action under this plan. There have been no modifications to the facility to suspect the covering of radioactive contamination.

3.2 Ensuring that Occupational Exposures are As Low As Reasonably Achievable

All activities will be conducted in a manner which will keep exposures to personnel and the environment as low as reasonably achievable. There is little chance of an occupational exposure in excess of 10% of the limits to radiation workers based on the history of the facility. In addition, when taking into consideration whether an item should be decontaminated or disposed, more weight will be given to the disposal option where the costs are roughly equivalent.

3.3 Health Physics Program

Health Physics monitoring will include whole body TLD badges, urinalyses of radiation workers, air sampling for particulates, and the frisking of workers in and out of the exclusion zone during any dismantling or demolition. Smears will be taken around the exclusion zone at the end of each day that such activities are performed.

The preliminary contamination survey will be performed by first monitoring each piece of equipment identified in Table 3 for both fixed and removable radioactive contamination. The smears will be analyzed by liquid scintillation counting. If gamma isotopes are suspected then each smear will also be analyzed by gamma spectroscopy. All floors, bench tops, cabinets, drawers, and dust collecting surfaces in the designated areas will be surveyed for fixed and removable activity. Survey instruments available to be used for the fixed activity monitoring include Eberline Model PAC-4G's with AC-21B probes designed to reveal the presence of beta activity; and Ludlum Model 19 microR meters to determine dose rates. If these specific instruments are unavailable, instruments of comparable efficiency and effectiveness shall be used.

The disposal of all radioactive waste will be performed by Teledyne Isotopes personnel using the procedures found in Attachment A.

All decontamination, dismantling, demolition and/or packaging of contaminated objects and wastes from decontamination activities will be performed by Teledyne Isotopes personnel. It is assumed that the only procedures that will be used are the Equipment and Area Decontamination and radioactive waste packaging procedures. Air samples will be taken if any operations generate dust and they will be analyzed by the method most appropriate for the suspected radionuclides. If levels greater than 10% of the DAC's are observed, personnel will be required to wear full face respirators fitted with radionuclide cartridges, and disposable coveralls, boots, and gloves.

A final survey for compliance with the "Guidelines for Decontamination..." will be done in selected areas if the preliminary survey indicates the need for any decontamination or dismantling. The same procedures identified previously in this section will be used here for the suspect areas.

3.4 Contractor Personnel

See Sections 2.3 and 2.4.

3.5 Radioactive Waste Management

The disposal of all radioactive waste will be performed by Teledyne Isotopes personnel using the procedures found in Attachments A and D.

4.0 Planned Final Radiation Survey

All compliance surveys will consist of radiation monitoring of the walls, equipment, floor and dust collecting surfaces. Direct radiation surveys will be conducted with an Eberline Instrument PAC-4G gas proportional survey meter with a 50 cm^2 probe and a 500 cm^2 floor monitor designed to reveal the presence of low energy beta radiation. A micro R meter, sensitive to gamma radiation, will be used to determine dose rates at representative areas of the facility. Removable radioactive contamination surveys will consist of smear samples taken by wiping approximately 200 cm^2 of surface area with an absorbant material at representative areas of the facility. Diagrams will be provided to identify where smear samples were taken. Smear samples will be analyzed by liquid scintillation counting with standard solutions traceable to the National Institute of Standards and Technology.

Also see Section 3.3.

5.0 Funding

This Decommissioning Plan will be funded by providing a Letter of Credit. This value is the amount estimated to perform the complete decommissioning as detailed in this Plan. The amount of the Letter of Credit will be adjusted at the time of renewal of this license, or whenever the types of materials being used at the facility appreciably change.

Funding documents are included as Attachment E.

See Table 6 in Attachment F for the summary of costs.

The salvage value from the sale of potential assets has not been included in the cost estimate.

6.0 Physical Security Plan and Material Control And Accounting Plan Provisions in Place During Decommissioning

Due to the levels of activity allowed on this license and the security already in place to prevent unauthorized access to the facility, no additional precautions for security will be implemented during decommissioning activities.

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DIAGRAM I

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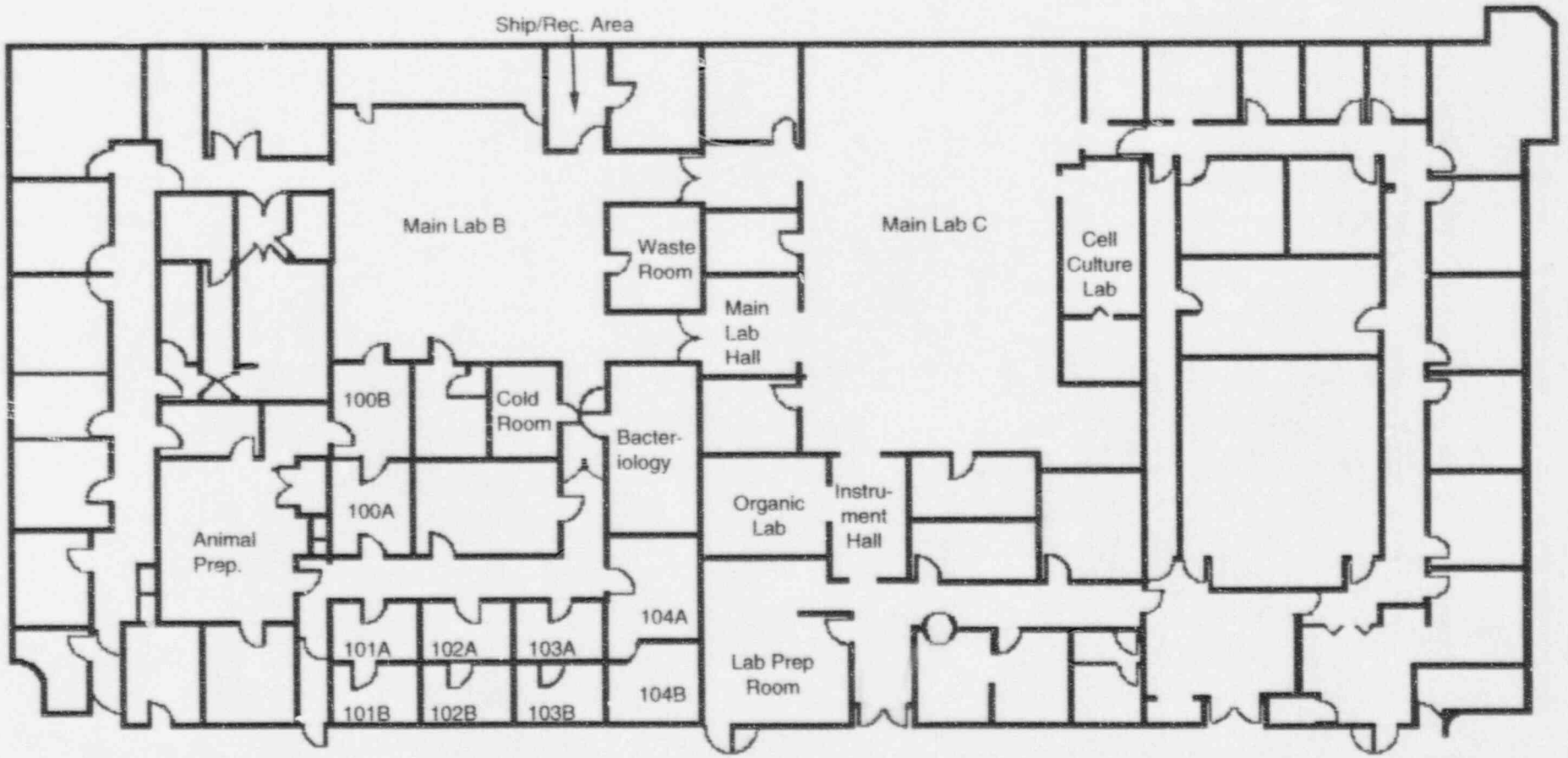
The Liposome Company, Inc.
Radioisotope Usage Areas

1 Research Way • Princeton Forrestal Center
Princeton • NJ • 08540



February 1991

Approximate Scale: 1/2" = 10 feet

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ATTACHMENT A

DECONTAMINATION PROCEDURE

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ATTACHMENT A

DECONTAMINATION PROCEDURE

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TELEDYNE ISOTOPES

EQUIPMENT AND AREA DECONTAMINATION

Purpose: To clean equipment or areas contaminated with radioactivity to levels suitable for their intended use or release from regulatory control.

Discussion: When working with loose radioactive material, a small quantity may become deposited on surfaces other than those in the designated area. Often, this can be cleaned using moistened towels, and a cleaning agent. Remember, even if a surface "looks clean" there may be contamination present. Only proper monitoring equipment and techniques can detect contamination.

Equipment: Absorbant cloth or paper towel, Radiacwash, Knox-on, survey meter, swipes, radwaste container, PPE appropriate to the situation, warning signs

Procedure:

1) Assemble the necessary materials and equipment prior to the start of the decontamination.

2) Restrict access to the area to prevent the spread of contamination.

3) Survey the area with a meter and/or smears to obtain an estimate of the levels of contamination.

4) Don the proper personal protective equipment (PPE) based on the survey results and the Health Physicists' direction.

5) Start in the least contaminated area and work towards the more contaminated area. Make only one pass with the cleaning cloth, then fold it over and use the other side or place it in the contaminated trash bag.

6) Clean using straight, even passes of the cloth. Avoid circular motion, as this will only spread the contamination around.

7) Upon completion of the decontamination, re-survey the area for both fixed and removable radioactivity. Record the results and submit the data to the Health Physicist for approval and authorization to release the area.

Safety Items: Any technician without prior experience in decontamination must be supervised by an experienced individual.

Additional Information: Ensure that the proper survey meter is used for the radionuclides suspected in the contamination. Refer to appropriate regulatory guidelines for release limits.

Forms Used: None

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ATTACHMENT B

RESUME: L. BUCCHERI, THE LIPOSOME CO.

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ELIZABETH BUCCHERI
Box 52-M Ross Lane
Jackson, New Jersey 08527

EDUCATION

M.S. Zoology 1982 Rutgers University, Newark, NJ
B.S. Biology 1980 Upsala College, East Orange, NJ
Minor - Chemistry. Cum Laude.

EXPERIENCE SUMMARY

Six years diversified scientific and business experience involving scientific research, personnel, laboratory safety and health management, radiation safety management and training, and laboratory/facility management.

EXPERIENCE

The Liposome Company, Inc., Princeton, NJ
Manager of Administrative and Technical Services

November 1985 to Present

Responsibilities:

Safety - Chairperson of Company Safety Committee. Conduct safety orientation and training programs. Write safety and emergency procedures manuals. Monitor accidents, personal protective equipment and OSHA compliance. Responsible for hazardous waste management and disposal.

Radiation Safety - Conduct radiation safety training, coordinate safety surveys. Responsible for radioactive materials management and waste disposal. Nuclear Regulatory Commission liaison.

Laboratory Management - Supervise a twelve room USDA registered animal facility, and complete annual USDA reports. Coordinate Institutional Animal Care and Use Committee. Supervise Glassware Preparation Facility, including the writing of Standard Operating Procedures.

Facility Management - Supervise general facilities maintenance program. Coordinate contract maintenance and repair for electrical, plumbing and construction projects.

Communications - AT&T systems management including programming of both Horizon & System 25 equipment. Responsible or system implementation, maintenance and employee training. Coordinate with New Jersey Bell & AT&T for service and repair.

Managerial - Supervise animal facility staff, Glassware Prep Technicians, and maintenance staff.

EXPERIENCE (Continued)

November 1985 to April 1987 — **Adinistrative Supervisor**

Responsibilities:

In addition to above, handled human resources responsibilities including maintenance of personnel records, benefits administration, recruitment and salary surveys. Assisted in developing the Company Employee Guidebook. Computerized the Human Resource function.

April 1983 to November 1985 — **Research Associate**

Coordinated, conducted and analyzed *in vivo* and *in vitro* biodistribution, efficacy and toxicity assays of drug dosage forms. Performed studies using radiolabeled drugs in animal models. Performed surgery and dissections. Prepared liposomal formulations and controls.

SEMINARS/ COURSES

New Jersey Institute of Technology, Asbury Park, NJ. "Medical Waste Workship", October 16, 1989.

The Center for Professional Advancement, East Brunswick, NJ. "Hazardous Waste Management", August 28-31, 1989.

Cook College Continuing Professional Education, New Brunswick, NJ. "Basic Radioisotope Theory", "Biological Effects of Ionizing Radiation", "Radioisotope Laboratory Safety", "Radiation Instrumentation", "Liquid Scintillation Counting", "Radiation Protection Program Management", "Radioactive Materials Transportation Regulations", "Radioactive Waste Management", February 27-March 15, 1989.

The Center for Professional Advancement, East Brunswick, NJ. "Safety in the Chemical Laboratory", December 7-8, 1987.

Mercer County College, "Contracts and Specifications and the Law", Spring 1988; "Blueprint Reading", Fall 1989.

MEMBERSHIPS

American Society of Safety Engineers

New Jersey Chapter Health Physics Society

ATTACHMENT C

RESUME: S. BLACK, TELEDYNE

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RESUME

TELEDYNE
BROWN ENGINEERING
Environmental Services

Steven A. Black, Manager - Radiological Services Department

Employment Experience
January 1977 - Current

TELEDYNE ISOTOPES (Teledyne Brown Engineering)
Mr. Black presently manages operations in the Radiological Services Department of Teledyne Brown Engineering's Westwood, New Jersey facility and is responsible for implementation of the health physics program as the facility's Radiation Safety Officer, and the facility's industrial & laboratory safety program. He has also been named the Plant Emergency Officer and is in charge of all evacuation and emergency procedures.

Specific duties include the following:

- Operational control of the Health Physics & Radioactive Waste product lines.
- Determining prices, preparing bids, and designing brochures and other marketing responsibilities.
- Maintaining the chemical inventory and proper hazardous waste disposal.
- Radioactive & hazardous materials shipping compliance.
- Compliance with N.J. Dept. of Environmental Protection Divisions of Air & Water Quality.
- Compliance and maintenance of five U.S. Nuclear Regulatory Commission licenses for the possession and use of radioactive materials.
- Compliance and maintenance of a New Jersey state license for the possession and use of radioactive materials.
- Implementing the facility's Right-To-Know program for employees and for emergency service personnel.
- Computerization of all facets of the business using both BASIC and UNIX based systems and Macintosh computers.
- Preparing and updating employee evacuation plans.
- Plant Emergency Officer and the liaison with the local volunteer fire department and Emergency Services Personnel.
- Macintosh Systems Administrator for the local Macintosh area network.

Education & Training

Brown University
Providence, Rhode Island
B.A. Biology 1975

Other: Mr. Black has completed a course in Radiation Protection at Harvard School of Public Health (1977) and a Rutger's University Radiation Science introductory course for the Master's program in Health Physics (1980). He has also completed numerous short courses on the packaging and transport of radioactive waste, and chemical and industrial safety.

Professional Affiliations

Nuclear Waste Brokers and Processors Association - founder & Secretary (1988)
National Health Physics Society - member since 1986
NJ Chapter of the Health Physics Society - member since 1980
National Fire Protection Association - member since 1988

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ATTACHMENT D

TELEDYNE ISOTOPES RSC&QCM

PERTINENT SECTIONS

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TELEDYNE ISOTOPES

RADIATION SAFETY PROCEDURES

SECTION II - GENERAL PROCEDURES FOR CONTROLLING RADIOACTIVE MATERIALS AND RADIATION EXPOSURES

This section deals with the general procedures for radiation protection which apply to the activities carried on under the several licenses currently in effect. Specific procedures relating to activities under particular licenses are included as sub-sections of Section III of this manual.

II-1.0 INDOCTRINATION OF PERSONNEL EXPOSED TO IONIZING RADIATION

II-1.1 *Company Policy on Matters Involving Radiation Exposure*

Work performed under the various licensed activities treated in this manual require in some cases some degree of exposure to radiation by operating personnel. It is necessary, therefore, to classify these individuals in the population subgroup of occupational radiation workers. For individuals classified in this group, radiation exposure must be recorded on the employee's radiation exposure history while in the employ of Teledyne Isotopes.

II-1.2 *Indoctrination of Personnel*

All persons starting to work with any radiation sources at Teledyne Isotopes are required to read this Radiation Safety Code and this is documented on Form IWL-HP-07. In addition, each employee is required to furnish as complete a history as possible of their training in the principles and practices of radiation protection. This is documented on Form IWL-HP-06. A basic radiation safety course is then presented to each employee. Included is the showing of a ten part film series entitled "The Story of Radiation", distributed by Training Resources, a division of Nuclear Support Services. The outline of this course is given on Form IWL-HP-07 and this form is used as documentation of the presentation. These records are kept in the person's health physics folder. Periodically, lectures and films on radiation safety are shown to keep all personnel appraised of the necessity for safe operating procedures.

Form IWL-HP-06 is given to the supervisor of the employee who then fills in the section requesting authorization for the employee. This form is sent to the Radiation Safety Officer who will determine what additional training or monitoring is required for the employee to begin work utilizing radioactive materials.

Persons who through their work attitudes and habits show a disregard for safe operating procedures with radioactive material are recommended for transfer out of radiation work or, if such alternative work is not available, may be terminated from employment.

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II-8.0 RADIOACTIVE WASTE PACKAGING & DISPOSAL

Radioactive waste materials are disposed of by the Radiological Services Department in accordance with all federal, state and local regulations. The generators of the waste are trained in the proper method of packaging the waste and then tested on their knowledge to ensure compliance. The materials will be packaged using the "Classification of Radioactive Waste to be Packaged for Shipment" as a guide, and in conformance with the "Packaging Procedure for Radioactive Waste".

II-8.1 *Training and Retraining of Personnel Involved With the Safe Packaging of Radioactive Material*

Any person engaged in the preparation of waste for disposal must be properly trained in all the DOT, NRC and burial site requirements for proper packaging. The training program is as follows:

8.1.1 Each person is given a copy of the current Radiation safety Code and Quality Control Manual. He is to study these procedures (II-8.2 and II-8.3) and then be tested on his knowledge of the material using Form IWL-RW-231, "Packaging of Radioactive Waste Examination".

8.1.2 Subsequent to the examination, each person will be physically supervised in the proper classification and packaging of waste in his area. Using Form IWL-RW-206, the supervisor will document such on-the-job training.

8.1.3 When the supervisor is satisfied the person has demonstrated a complete understanding of the procedures, he will notify the Radiation Safety Officer, who will authorize the individual to perform these procedures unsupervised and will document this on Form IWL-RW-206.

8.1.4 Retraining of the individual in the most current DOT, NRC, and burial site packaging requirements is to be performed at a maximum one year interval unless significant changes require immediate review. Retraining and review will be documented using Form IWL-RW-206, or by filing a memorandum in each trainee's training folder.

II-8.2 *Classification of Radioactive Waste to be Packaged for Shipment*

8.2.1 Characteristics of Material to be Packaged

Isotope
Activity (mCi)
Physical State (solid, liquid, vials, carcasses, biological matter or gas)
Concentration (mCi/gram)
A_1, A_2 Values
Form (Normal or Special)
10CFR Part 61 Class A, B, C Stable or Unstable
Chemical Form

8.2.2 Proper Shipping Name and UN ID Number

Radioactive Material, Limited Quantity, n.o.s. (UN2910)
Radioactive Material, Low Specific Activity or LSA, n.o.s. (UN2912)
Radioactive Material, n.o.s. (UN2982)
Radioactive Material, Special Form, n.o.s. (UN2974)
Radioactive Material, fissile, n.o.s. (UN2918)
Radioactive Material, Instruments & Articles (UN2911)
Uranyl Acetate (RQ-5000/2270) (NA9180)
Uranyl Nitrate, solid (RQ-5000/2270) (UN2981)

8.2.3 Determination of Shipment Specification

What specification container is required.
What labels are required.
Whether a security seal is needed or not.
mR/hr limits @ contact.
Additional requirements.

II-8.3 *Packaging Procedures for Radioactive Waste*

8.3.1 General

8.3.1.1 Categories of Radioactive Waste:

There are three disposal facilities being used and the categories for each are listed below:

8.3.1.1.1 BURIAL AT RICHLAND, WASHINGTON

(DMR) Dry Material destined for Richland
(DCR) Dry Compactibles destined for Richland
(SVR) Small Volume liquids destined for Richland
(LVR) Large Volume liquids destined for Richland
(ACR) Animal Carcasses or biological waste destined for Richland

8.3.1.1.2 PROCESSING AT QUADREX HPS, GAINESVILLE, FLORIDA

(VXN) Scintillation Vials - NRC exempt - Non RCRA regulated
(VRN) Scintillation Vials - NRC regulated - Non RCRA regulated
(VXR) Scintillation Vials - NRC exempt and RCRA regulated
(VRR) Scintillation Vials - NRC regulated and RCRA regulated

8.3.1.1.3 PROCESSING AT SCIENTIFIC ECOLOGY GROUP, OAK RIDGE, TENNESSEE

(DMS) Dry solid Material destined for S.E.G.
(DCS) Dry solid Compactible destined for S.E.G.
(SVS) Small Volume liquid destined for S.E.G.

TELEDYNE ISOTOPES

RADIOACTIVE MATERIAL PACKAGING GUIDE

MATERIAL DESCRIPTION	CONTAINER TYPE	LABEL REQUIRED	SECURITY SEAL REQUIRED	INTERNAL PACKAGING REQUIRED	mR/hr LIMITS @ CONTACT	COMMENTS
DRY SOLID MATERIAL						
a. Radioactive Material, LSA, n.o.s. (exclusive-use)	Unspecified	Radioactive-LSA	no	Unspecified	0-200.0	
b. Radioactive Material, Limited Quantity, n.o.s.	Unspecified	Radioactive	no	Unspecified	0-0.5	
c. Radioactive Material, Instruments & Articles	Unspecified	Radioactive	no	Unspecified	0-2.0	mR/hr limits @ contact 0-2.0 if shipped exclusive-use
d. Radioactive Material, n.o.s.	DOT 7A-Type A	Radioactive White I	yes	Braced	0-0.5	Require weight printed on outside of package when in excess of 110 lbs.
		Radioactive Yellow II	yes	Braced	0.5-50.0	
		Radioactive Yellow III	yes	Braced	50.0-200.0	
e. Radioactive Material, special form, n.o.s.	DOT 7A-Type A	Radioactive White I	yes	Braced	0-0.5	Require weight printed on outside of package when in excess of 110 lbs.
		Radioactive Yellow II	yes	Braced	0.5-50.0	
		Radioactive Yellow III	yes	Braced	50.0-200.0	
SMALL VOLUME LIQUIDS						
a. Radioactive Material, LSA, n.o.s. (exclusive-use)	DOT 7A-Type A	Radioactive-LSA	no	*See instructions	0-200.0	
b. Radioactive Material, n.o.s.	DOT 7A-Type A	Radioactive White I	yes	*See instructions	0-0.5	Require weight printed on outside of package when in excess of 110 lbs.
		Radioactive Yellow II	yes	*See instructions	0.5-50.0	
		Radioactive Yellow III	yes	*See instructions	50.0-200.0	
LARGE VOLUME LIQUIDS						
a. Radioactive Material, LSA, n.o.s. (exclusive-use)	DOT 7A-Type A	Radioactive-LSA	no	*See instructions	0-200.0	
b. Radioactive Material, n.o.s.	DOT 7A-Type A	Radioactive White I	yes	*See instructions	0-0.5	Require weight printed on outside of package when in excess of 110 lbs.
		Radioactive Yellow II	yes	*See instructions	0.5-50.0	
		Radioactive Yellow III	yes	*See instructions	50.0-200.0	
ANIMAL CARCASSES						
a. Radioactive Material, LSA, n.o.s. (exclusive-use)	DOT 7A-Type A	Radioactive-LSA	no	*See instructions	0-200.0	
b. Radioactive Material n.o.s.	DOT 7A-Type A	Radioactive White I	yes	*See instructions	0-0.5	Require weight printed on outside of package when in excess of 110 lbs.
		Radioactive Yellow II	yes	*See instructions	0.5-50.0	
		Radioactive Yellow III	yes	*See instructions	50.0-200.0	

* SPECIAL NOTE ON SMALL VOLUME LIQUIDS: Scintillation vials and fluids must be packaged separately from all other small volume liquids.

NOTE: n.o.s. means: "not otherwise specified."

IWL-0372-451

Date: Initials:

Reviewed: _____ _____

Revised: 11/90 SAB

8.3.1.2 Items in different categories cannot be mixed in any one container unless specifically authorized.

8.3.1.3 The packaging procedure that is used is to be marked on the drum (e.g. DMR-8/87)

8.3.1.4 Transuranic and radium waste in excess of 10 nanocuries per gram is not acceptable unless specifically authorized.

8.3.1.5 Gaseous waste must meet certain provisions. Please see the burial site's license for details or call the Radiological Services Department Office.

8.3.1.6 Special Nuclear Material requires specific approval and will be accepted only upon special request to the Radiological Services Department Office.

8.3.1.7 DO NOT EXCEED THE FOLLOWING WEIGHTS UNLESS SPECIFICALLY AUTHORIZED:

5 gallon container - 80 lbs.
30 gallon container - 300 lbs.
55 gallon container - 480 lbs.

8.3.1.8 Chemical Toxicity:

The chemical composition of the materials disposed must be compatible with the procedures which follow. Any additional hazards of the material must be evaluated to determine if additional packaging is required. If materials are listed in J. Irving Sax's "Dangerous Properties of Industrial Materials", Fifth Edition, Van Nostrand Reinhold, as having a THR=HIGH via any route, except IP or IV, specific approval must be obtained from the State of Washington Radiation Control Program. Contact the Radiological Services Department for details.

8.3.1.9 Prohibitions

8.3.1.9.1 Burial Prohibitions:

Lead and other U.S. EPA hazardous wastes are prohibited from land burial at the current radioactive waste disposal sites. Please ensure there are no Resource Conservation and Recovery Act (RCRA) wastes in your radioactive waste streams.

8.3.1.9.2 Scintillation Vial Processing

Only those isotopes listed in the Quadrex license are allowed for processing. In addition, strict control must be held over the packaging of scintillation vials. No other wastes of any kind are allowed in these containers.

8.3.1.10 Special Notes

Two 2 mil liners may be used in place of a single 4 mil liner.

Instead of lining the whole drum, individual 4 mil (or double 2 mil) bags may be substituted, provided each bag is layered as above.

For a list of approved absorbants, solidification and stabilization media for use with waste destined for Richland, please see the US Ecology license.

When layering, the absorbant must be the first layer on the bottom and the last layer on the top. Proper volume ratios must be determined by the generator to be used for the different absorbants.

The amount of absorbant must be capable of absorbing twice the amount of liquid present.

8.3.1.11 VOIDS - All voids in the containers must be filled to the extent practicable.

8.3.2 WASTE FOR BURIAL AT US ECOLOGY, RICHLAND, WASHINGTON

8.3.2.1 DRY SOLID MATERIAL FOR BURIAL AT RICHLAND, WASHINGTON (DMR-8/87)

8.3.2.1.1 Select a 5, 30 or 55 gallon drum.

8.3.2.1.2 Fill to capacity with only dry solid materials.

8.3.2.1.3 Fill in any voids to the extent practical.

8.3.2.1.4 Secure drum cover.

8.3.2.1.5 Label drum DMR-8/87, to designate that the drum has been packaged according to these directions.

8.3.2.2 DRY SOLID COMPACTIBLES FOR BURIAL AT RICHLAND, WASHINGTON (DCR-8/87)

8.3.2.2.1 Select a 30 or 55 gallon container.

8.3.2.2.2 Place waste into double 4 mil plastic liners. (Note: For 55 gallon drums, use two sets of double 4 mil bags, each set approximately 27 gallons. If heavy materials are used, please use additional double 4 mil liners and decrease the quantity put into each.)

8.3.2.2.3 Twist and seal liners.

8.3.2.2.4 Place double 4 mil bags into the selected container.

8.3.2.2.5 Replace lid and ring.

8.3.2.2.6 Secure ring. DO NOT BOLT.

8.3.2.2.7 Label drum DCR-8/87 to indicate it was packaged in accordance with these instructions.

NOTE: DO NOT DISPOSE OF UNPROTECTED SHARP OBJECTS.

NOTE: DO NOT DISPOSE OF NON-COMPACTIBLE ITEMS IN THESE TYPES OF CONTAINERS.

NOTE: ONLY LOW SPECIFIC ACTIVITY MATERIAL IS ACCEPTABLE IN COMPACTIBLE DRUMS. UNDER NO CIRCUMSTANCES SHOULD SOURCES BE PLACED INTO THESE CONTAINERS.

8.3.2.3 SMALL VOLUME LIQUID WASTE DESTINED FOR RICHLAND (SVR-8/87)

These drums can contain vials which contain liquids which are acceptable for burial, and each vial must contain less than 50 ml of liquid.

Liquid should not be absorbed directly onto the absorption media (e.i. do not open vials). Any tool or device which contains free standing liquid must be considered small volume liquid waste. Please reference the definition of free standing liquid as found in US Ecology's license.

8.3.2.3.1 Select only a 30 or 55 gallon drum; 5 gallon pails are not allowed.

8.3.2.3.2 Line the drum with 4 mil thick poly liner.

8.3.2.3.3 Using an approved absorbant, alternate layers of absorbant with layers of waste.

8.3.2.3.4 Twist and seal liner.

8.3.2.3.5 Secure drum cover.

8.3.2.3.6 Label drum SVR-8/87, to designate that the drum has been packaged according to these instructions.

8.3.2.3.7 Special Note: Toluene, Xylene and other flammable liquids in scintillation vials will not be accepted for burial. They must be packaged for reprocessing and meet the reprocessor's license criteria.

8.3.2.4 LARGE VOLUME LIQUID WASTE DESTINED FOR RICHLAND (LVR-8/87)

All items containing 50 ml or more of an aqueous liquid may not be disposed in SVR or SVS drums. The liquid must be packaged as follows while the container itself must be either (1) dried and placed in a DMR, DCR, DMS or DCS drum or (2) placed in an SVR or SVS drum once the bulk of the liquid is removed.

8.3.2.4.1 Select only the 55 gallon double-walled container for liquid waste.

8.3.2.4.2 Remove the 55 gallon drum cover.

8.3.2.4.3 Loosen and remove the bung from the 30 gallon drum which has been filled with an approved absorbant.

8.3.2.4.4 Pour up to 10 gallons of liquid (pH-6.0 - 9.0) into the absorbant in the 30 gallon drum through the 2-1/2" opening.

8.3.2.4.5 Replace bung and tighten

8.3.2.4.6 Twist and seal poly liner.

8.3.2.4.7 Secure cover of 55 gallon drum.

8.3.2.4.8 Label drum LVR-8/87 to designate that the drum has been packaged according to these instructions.

8.3.2.4.9 SPECIAL NOTE

Toluene or Xylene and other liquids unacceptable at the burial site cannot be absorbed.

8.3.2.5 ANIMAL CARCASSES OR BIOLOGICAL WASTE (ACR-8/87)

Animal carcasses or biological waste must be disposed using a double-walled container. Be sure when ordering to specify a 55 gallon double-walled container for animal carcasses.

8.3.2.5.1 Select only a 55 gallon double-walled drum.

8.3.2.5.2 Remove inner 30 gallon container and absorbant.

8.3.2.5.3 Line 30 gallon drum with 4 mil poly liner. See Section 8.3.1.10.

8.3.2.5.4 Package waste into liner using at least one part slaked lime for every 10 parts of an approved absorbant. Fill completely.

8.3.2.5.5 Twist and seal liner.

8.3.2.5.6 Seal 30 gallon drum.

8.3.2.5.7 Place 30 gallon drum in 50 gallon drum.

8.3.2.5.8 Place absorbant around and covering 30 gallon drum.

8.3.2.5.9 Secure 55 gallon drum cover.

8.3.2.5.10 Label drum ACR-8/87 to designate that drum has been packaged according to these instructions.

8.3.3 RADIOACTIVE WASTE FOR PROCESSING AT S.E.G., OAK RIDGE, TENNESSEE

8.3.3.1 DRY SOLID MATERIAL DESTINED FOR S.E.G. (DMS-8/87)

8.3.3.1.1 See the procedure for DMR and follow exactly, except for labelling the container DMS-8/87, however, only Class A unstable materials are acceptable. Please see the S.E.G. license for further details on acceptable materials.

8.3.3.2 DRY SOLID COMPACTIBLE DESTINED FOR S.E.G. (DCS-8/87)

8.3.3.2.1 See the procedure for DCR and follow exactly, except for labelling the container DCS-8/87, however, only Class A unstable materials are acceptable. Please see the S.E.G. license for further details on acceptable materials.

8.3.3.3 SMALL VOLUME LIQUIDS DESTINED FOR S.E.G. (SVS-8/87)

8.3.3.3.1 See the procedure for SVR and follow exactly, except for labelling the container SVS-8/87.

8.3.3.3.2 The liquids present must be strictly incidental. A couple of examples of incidental liquids are:

a) A drop in the end of a pipette
b) A couple of milliliters in the bottom of a vial
c) Moisture on the sides of a beaker

8.3.3.3.3 Use the absorbant sparingly.

SPECIAL NOTE: In the SVS drum you may mix other dry waste which would be suitable for either the DMS or DCS container. You do not have to segregate these three types as long as the drum is classified as an SVS-8/87.

8.3.4 SCINTILLATION VIAL WASTE FOR REPROCESSING AT QUADREX, GAINESVILLE, FLORIDA (VXN, VRN, VXR, VRR)

These drums may contain scintillation vials which contain Toluene or Xylene or any other flammable scintillation media acceptable according to Quadrex's License No. 1354-1 (State of Florida, Department of Health & Rehabilitative Services).

All drums to Quadrex are packaged identically using the procedure below, however, the labelling and manifesting are specific to the classification selected. The generator is responsible for identifying the isotopes, concentrations and chemical forms of the waste material.

8.3.4.1 Select only a 30 or 55 gallon drum.

8.3.4.2 Line the drum with 4 mil thick poly liner.

8.3.4.3 Add 12 inches of an approved absorbant.

8.3.4.4 Line drum again with another 4 mil thick poly liner.

8.3.4.5 Fill with vials or other containers of less than one pint capacity.
NOTE: With one pint containers, add absorbant to suitably cushion these to prevent breakage.

8.3.4.6 Twist and seal liners.

8.3.4.7 Top off the drum with additional absorbant.

8.3.4.8 Secure drum cover.

8.3.4.9 Label drum with the appropriate designation for the descriptions below.

8.3.4.10 Classification of Scintillation Vial Drums

There are many different types of scintillation fluids being used by the industry. The major differences between these fluids is their flashpoint. The state your facility is in may, or may not, regulate these fluids as hazardous waste. Although we have been and will continue to help identify when and where the RCRA regulations apply, it is the generator's responsibility under RCRA regulations to determine if his waste stream is a Hazardous Waste.

"V" - For marking purposes, all scintillation vial drums will have a first character of "V".

"X" or "R" - The second character will be either an "X" or and "R". If the drum contains only H-3/C-14 in less than 0.05 uCi/gram concentrations it is an "X". If the drum contains H-3/C-14 as above plus other isotopes listed in Quadrex's license, then it is an NRC "R"egulated material and would be an "R".

"N" or "R" - The third character indicates whether the drum is US EPA RCRA "R"egulated or "N"ot regulated. This classification is simple for those who use a high (greater than 140 F) flashpoint cocktail as these fluids are "N"ot RCRA regulated. If you have a cocktail with a lower flashpoint, the material may, or may not, be "R"egulated. This depends on each state. As the states are currently changing their positions rapidly, we have not included a listing in these procedures. Please call for further information.

TELEDYNE ISOTOPES

SECTION III - SPECIAL PROCEDURES APPLICABLE TO ACTIVITIES UNDER SPECIFIC LICENSES

Teledyne Isotopes carries out activities involving radioactive material under 13 different licenses from state, national, and foreign government authorities. In addition to continuing licenses, other activities are carried out under temporary permits or reciprocal recognition of existing licenses with a variety of special requirements. Because the Radiation Safety Code and Quality Control Manual may be required to support the application for or operation under a given license, it is designed in such a way that only the general provisions of the code and the provisions particularly applicable to a given license are included in copies presented to a given agency.

This copy includes the sections relevant to the licensed activities checked below.

____	III-1.0	USAEC Byproduct Material License (No. 29-00055-06) C Specific License of Broad Scope
✓	III-2.0	USNRC Materials License (No. 29-00055-14) (Radioactive Waste Disposal)
____	III-3.0	USNRC Special Nuclear Materials License (No. SNM-107)
____	III-4.0	USNRC Materials License (No. 29-00055-15) (Metal Decontamination)
____	III-5.0	USNRC Depleted Uranium Source Material License (No. SUB-1235)
____	III-6.0	USNRC Byproduct Material License (No. 29-00055-02) (Teletrace)
____	III-7.0	Colombia, South America License for Importation or Use of Radionuclides (No. 320) (Licencia Para Importacion o Manejo de Radionuclides No. 320) (Teletrace)
____	III-8.0	State of New Jersey, Dept. of Environmental Protection, Radioactive Material License (No. 10123)
____	III-9.0	US Dept. of H.E.W. Clinical Laboratory License (No. 29-1012) (Radio-Bioassay)
____	III-10.0	Radiation Surveys
____	III-11.0	Atomic Energy Control Board of Canada Radioisotope License
____	III-12.0	Refinery Process Research Amendment Application Process for NRC License #29-00055-06
____	III-13.0	State of Illinois Radioactive Material License (No. IL-00514-01)

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III-2.0 RADIOACTIVE WASTE DISPOSAL

III-2.1 *Introduction to Radioactive Waste Licensing Section*

The procedures incorporated in this part cover provisions of Teledyne Isotopes' NRC License #29-00055-14 and New Jersey State License No. NJSL-10123, and other applicable local, state and federal laws, rules and regulations.

This license is for the pickup and transportation of prepackaged radioactive waste materials from customer's facilities. Dry waste packages may also be opened and compacted and repackaged in accordance with the procedures described herein.

III-2.2 *Licenses*

The following pages are copies of Teledyne Isotopes NRC License #29-00055-14 and New Jersey State License No. NJSL-10123, with the most recent amendments.

III-2.3 *Training & Certification of Radioactive Waste Disposal Technicians*

The purpose of this section is to establish procedures whereby individuals will be trained in all aspects of radioactive waste disposal regulations, techniques and procedures.

Due to the highly technical expertise required to enable an individual to perform a radioactive waste pickup-transfer, these procedures must be followed to insure the individual is qualified to perform these pickups/transfers. Due to the connection of DOT and NRC regulations both are covered in these procedures.

2.3.1 All radioactive waste technicians (drivers) are required to fill out the following forms before commencing work:

Description	Form No.
1. Application for employment	IWL-RW-217
2. State of violations	IWL-RW-218

2.3.2 An "Inquiry to State Agency for Driver's Record", Form IWL-RW-219 must be filled out by the supervisor and mailed along with the applicable fee.

2.3.3 Driver must take DOT written examination, Form IWL-RW-220, pp. 1-4. Upon completion of test, supervisor must grade and offer the correct answers to the driver. Supervisor must then issue a "Certificate of Written Examination", Form IWL-RW-221, to the driver.

2.3.4 Driver must be road tested on the equipment he is to use, documenting this on Form IWL-RW-222, "Driver Road Test".

2.3.5 Driver must be given a physical examination by a qualified physician using Form IWL-RW-223. Upon satisfactory completion of the physical, the driver will be given a copy of the bottom of Form IWL-RW-223 entitled "Medical Examiner's Certificate".

2.3.6 User Request Form IWL-HP-06 is to be completed by the individual, his supervisor, and the Health Physics Section as detailed on the form.

2.3.7 All drivers are then indoctrinated in the basics of radiation safety, including, but not limited to, atomic structure, radiation units and the interaction of radiation with matter. The outline of this course is presented on Form IWL-HP-07. The formal course lasts for approximately two (2) hours. Persons authorized to conduct this course are: 1) the Radiation Safety Officer; 2) the Alternate Radiation Safety Officer; 3) any individual so authorized by the Radiation Safety Committee.

2.3.8 Each driver is given a copy of the current Radiation Safety Manual, including Section III-2. He is to study this section and then is tested on his knowledge of the material using Form IWL-RW-224 entitled "Radioactive Waste Procedure Examination". It is graded by his supervisor and any wrong answers are clarified to his satisfaction.

2.3.9 Subsequent to the items above, each driver is subject to on-the-job training for a period of at least one week. This requires that either the supervisor, or another senior person capable of instructing all facets of the job, is physically present with the new employee throughout all phases of the pickup operation.

2.3.10 The person performing the training reports to the Radiation Safety Officer as to the competence of the new employee. If so required, additional supervised on-the-job training and classroom training are performed. Otherwise, the new employee is allowed to perform his job function with periodic spot checks on his performance made by his supervisor.

2.3.11 Periodic retraining of the most current NRC, DOT and burial site regulations are performed. This is documented using Form IWL-RW-208 or a copy of a memo which lists the items discussed is kept in the driver's training file.

2.3.12 An "Annual Review of Driving Record" is performed and documented using Form IWL-RW-225 during the anniversary of each new employee, or at a conveniently scheduled time not to exceed thirteen months.

2.3.13 Each individual authorized by the Radiation Safety Officer to operate the radioactive waste compactor must have a thorough understanding of the procedures found in Section III-2.4.12 of the manual and our Respiratory Safety Manual IWL-8214-482. This will be documented on Form IWL-RW-206.

III-2.4 *Receiving, Transportation and Storage of Radioactive Waste*

The danger involved in picking up radioactive wastes is very small; however, to insure that all conditions of the applicable NRC, Agreement State, DOT and burial site regulations are complied with, these procedures will be strictly adhered to by all personnel while in the process of picking up radioactive wastes from any facility. A copy of this section will be located in each of the vehicles and in the warehouse.

2.4.1 Preparation for Pickup

2.4.1.1 Use the following checklist to insure you have the proper equipment.

CHECKLIST FOR RADIOACTIVE WASTE PICKUP (FORM IWL-RW-207)

Table A - Health Physics Department

TLD Badge
GM Survey Meters:
1 - 50 mR/hr range with thin end window (e.g. E-120)
1 - 1000 mR/hr range (e.g. E-130G)
Filter papers or other absorbant paper

Table B - Department of Transportation Equipment

Driver's Log Book
Radioactive Waste Delivery/Pickup Forms
Radioactive Waste Manifest Forms
Appropriate maps
Work gloves

2.4.1.2 Miscellaneous equipment (e.g. Security Seals, ratchet wrench, waste manifest forms, screwdriver, portable 5-gallon pail sealing tool, labels: Rad I, II, and III, Flammable Liquid, etc., cash, credit cards, nuts, bolts, marker, pens, etc.).

2.4.1.3 Map out the route you intend to use.

2.4.1.4 Special Precautions:

Assure that no unauthorized bridge or tunnel is used. Be sure that you have the telephone numbers of all bridges/tunnels you intend to use which require advance notification. See Form IWL-RW-205 for a listing.

2.4.2 Traveling

2.4.2.1 Before departing and at the beginning of each day, perform the vehicle inspection as detailed in your driver's log book.

2.4.2.2 Be aware of your fuel supply at all times.

2.4.3 Receiving Waste

2.4.3.1 Upon arrival at the facility, contact the person the material is to be received from. In no case will material be received without a representative of the facility being present. If no authorized person is available, call the office (201-664-7070).

2.4.3.2 Don gloves.

2.4.3.3 Inspect drum, noting contents and packaging requirements. If drum does not appear to be packaged according to proper procedures, refuse acceptance and call the office. See Section II-8.0 for packaging procedures.

2.4.3.4 Open and inspect all containers labeled DCS or DCR prior to sealing them for transport. If any item is found not to be "dry", "solid", or "compactible", the container will be refused as a dry solid compactible drum.

2.4.3.5 Check response of the survey meter against the check source provided.

2.4.3.6 Monitor each container with the survey meters. Containers reading in excess of 200 mR/hr at the surface, or 10 mR/hr at one meter, must be repackaged before acceptance.

2.4.3.7 Swipe approximately 300 cm^2 of each container with the filter paper. Read each swipe with the E-120 end window GM counter. Containers with removable contamination in excess of 500 cpm/100 cm^2 must be decontaminated before acceptance. Please note that it is the shipper's responsibility for ensuring that the container is within the DOT limits for removable contamination which are specified in 49 CFR 173.443.

2.4.3.8 Ensure from customer representative that containers are not overloaded. Amount allowed depends on the transport groups. Remember we only handle Type A packages. See Form IWL-RW-209.

2.4.3.9 From the information obtained above, determine the type of labels required (e.g. Class I, II, III; Part 61 Class A,B, or C; STABLE or UNSTABLE; Radioactive LSA; or Radioactive). See Section II-8.2 for external packaging requirements.

2.4.3.10 Ensure that the Radioactive Waste Manifest (RWM) form is properly filled out. Obtain the representative's signature and date the RWM. Sign where indicated, remove customer copy, and return all other copies to Teledyne Isotopes.

2.4.3.11 Obtain properly executed Radioactive Waste Certification Statement (Form IWL-RW-204) from the customer.

2.4.3.12 Label drum. If the drum has not been labeled in accordance with Section II-8.3 (e.g. DCS, VXN, ACR,etc.), do so.

2.4.3.13 Label drum with appropriate NRC Part 61 waste Class obtained from the customer if not already provided.

2.4.3.14 Label drum with mR/hr reading if in excess of 10 mR/hr.

2.4.3.15 Seal containers tightly. If material is either "normal - Type A" or "special" form, incorporate a security seal.

2.4.3.16 Once <u>any</u> radioactive material is placed into the vehicles, all four placards must read RADIOACTIVE. <u>Exception</u>: If all containers have Radioactive I or II labels, security seals and meet DOT 7A type A packaging requirements, or if all the drums on the vehicle are limited quantity.

2.4.4 Transportation

2.4.4.1 Do not leave vehicle except in an extreme emergency. See Section III-2.4.7 through 2.4.9.

2.4.4.2 Follow traffic laws completely. No speeding.

2.4.5 Storage

2.4.5.1 Upon arrival at the warehouse, the containers will be loaded into the warehouse or onto the transport vehicle destined for the disposal facility.

2.4.5.2 Segregate all compactible waste containers and put them into the warehouse on pallets. These wastes are to be compacted when sufficient quantities have been received. Follow special "Procedure for Compacting Radioactive Waste" in Section III-2.4.12.

2.4.5.3 Remove "Radioactive" placards.

2.4.5.4 Monitor warehouse with E-120. No radiation level in excess of 0.5 mR/hr is acceptable at the exterior of the building.

2.4.5.5 Monitor vehicle - See Section 2.7.4.

NOTE: If activity found is in access of the limits specified, notify the Radiation Safety Officer, who will then supervise the decontamination of the vehicle.

2.4.6 Radioactive Waste Pickup Report

Bring all Manifests and Certification Statements to the office and place in the appropriate Radioactive Waste In-Box.

2.4.7 Spillage

2.4.7.1 In case of spillage, prevent further spreading of contamination. This can be accomplished by pouring some "approved" absorbant on any liquid present. Cover to prevent scatter by wind.

2.4.7.2 If spillage occurs within a facility being visited, notify the Radiation Safety Officer or other authorized individual.

2.4.7.3 Notify Teledyne Isotopes at 201-664-7070 and ensure that one of the following is reached:

The Company Health Physicist
The Radiation Safety Officer
The Alternate Radiation Safety Officer
Manager of Radiological Services Department
Chairman of the Radiation Safety Committee

If the office is closed for the day, use the home phone numbers found in Section II-3.4.

2.4.7.4 At least one person should be stationed at the site to keep unauthorized personnel away from the contaminated area.

2.4.8 Vehicle Breakdown

2.4.8.1 In the event a breakdown occurs while the vehicle is transporting radioactive materials, accomplish the following in the order given:

Place one red reflective triangle at each of the following locations:

100 feet behind the vehicle in the center of the lane the vehicle occupies.

100 feet in front of the vehicle in the center of the lane the vehicle occupies.

10 feet in front or back of the vehicle on the traffic side.

2.4.8.2 Notify the local police. This can be done by stopping a passing motorist and having him notify the police. Make sure they give the police a detailed description of where the breakdown occurred.

2.4.8.3 The driver will not leave the vehicle unattended unless in an extreme emergency in which case the vehicle will be locked and the wheels should be chocked to prevent movement.

2.4.8.4 Notify Teledyne Isotopes. See Section 2.4.7.3.

2.4.8.5 If necessary, another vehicle will be dispatched to the scene of the breakdown an the radioactive material will be transferred to the replacement vehicle for transportation to the warehouse.

2.4.8.6 The disabled vehicle will then be towed to a garage for repairs.

2.4.9 Vehicle Accident

In the event an accident occurs, accomplish the following in the order given:

2.4.9.1 Exit the cab of the vehicle and take the Radioactive Waste Manifest Forms with you.

2.4.9.2 Assist any injured.

2.4.9.3 Isolate the area. If you can prevent the spreading of contamination, do so.

2.4.9.4 Notify Teledyne Isotopes as in Section 2.4.7.3.

2.4.9.5 Advise police and/or firemen of load contents.

2.4.9.6 The Radiation Safety Officer will take appropriate actions based on the situation. These actions might be any of the following if required

Determine the extent of damage and the hazards involved.

Direct removal of any radioactive materials involved.

Monitor the area to determine the extent of any contamination.

Direct decontamination operations if required.

Direct removal of vehicle.

Assist police and/or firemen in any way possible.

Notify NRC or State Offices as soon as possible.

Notify American Nuclear Insurers at 203-677-7715.

2.4.10 General Responsibilities

It will be the responsibility of each individual to notify his supervisor, in writing, immediately upon observing any situation or action which could be instrumental in causing an accident or incident of any kind. In an extreme emergency, the vehicle should be driven to the nearest dealer and any repairs needed should be performed.

2.4.11 Special Procedure: Shipping Radioactive Waste to US Ecology in Richland, Washington

2.4.11.1 Prior Notification

* Request Tri-State Motor Transit (TSMT) to supply vehicle.

  State date, time, place and destination

  Telephone: 800-641-7591

* Notify the State of New Jersey

  State when, what carrier, route, curies and primary isotopes.

  Telephone: 609-292-5586.

Exception: All shipments under 20 curies total are exempt from this requirement.

2.4.11.2 Loading and Monitoring the Vehicle

* Use Form IWL-RW-210, "Radioactive Waste Shipment Checklist (RWSC)", when loading the vehicle. Note the last three digits (e.g. Trailer No. 440123, note #123) on the copies of the Radioactive Waste Manifest (RWM) forms.

* Follow the general radiation safety procedures outlines in Section II of the Radiation Protection Manual during all loading and unloading operations.

* Ensure all placards are in place.

* Ensure load is braced and secured.

2.4.11.3 Compilation of Shipping Papers & Release of Shipment

* Before carrier arrives:

  Using the Radioactive Waste Shipment Checklist, compile all the RWM forms on the load. Number each consecutively, enter date of shipment, carrier, and shipper's number.

  Tally all RWM forms thus completed on Shipment Record Form IWL-RW-212.

  Using totals figures on IWL-RW-212 forms, fill out Bill of Lading.

  Separate the transporter copy from all completed RWM forms and discard.

  Fill out four (4) State of Washington Certifications (Form IWL-RW-215) and have R.S.O. or other authorized individual approve each.

  Fill out one (1) Statement of Certification for the shipment. Make three (3) copies and attach one to each of the four (4) State of Washington Certification.

* After the carrier arrives:

Have the driver inspect the load for bracing and attach security seals to all access doors. Note on the "Exclusive Use Statement" and the "Bill of Lading" the Security Seal Numbers which are used. Make two copies.

Using Forms IWL-RW-201 and IWL-RW-202, monitor the vehicle and record readings.

Have the driver remove the filled trailer and replace with the empty trailer.

Have the driver sign four (4) copies of the State of Washington Certification (Form IWL-RW-215), the Bill of Lading and each Manifest where indicated.

Complete the Bill of Lading using information supplied by the driver:

Complete "Exclusive Use Statement".

2.4.11.4 Give the following items to the T.S.M.T. driver for T.S.M.T.:

Original Bill of Lading
Original of "Exclusive Use Statement" (IWL-RW-214)
One copy of the Manifests
Original of Forms IWL-RW-201 and IWL-RW-202.
Two originals of State of Washington Certification with Statement of Certifications attached. (Forms IWL-RW-215 and IWL-RW-227)

2.4.11.5 Give the following items to the T.S.M.T. driver for US Ecology:

Bill of Lading "This Memorandum"
Copy of "Exclusive Use Statement" (IWL-RW-214)
Two original white copies of Manifests
Copies of Forms IWL-RW-201 and IWL-RW-202
One original of State of Washington Certification with Statement of Certification attached (Forms IWL-RW-215 and IWL-RW-227)

2.4.11.6 Teledyne Isotopes -- retain the following items for our records:

Bill of Lading "This Shipping Order"
Copy of "Exclusive Use Statement" (IWL-RW-214)
Copies of Manifests
Copies of Forms IWL-RW-201 and IWL-RW-202
One original of State of Washington Certification with Statement of Certification attached (Forms IWL-RW-215 and IWL-RW-227)
Copy of Burial Verification Certification (IWL-RW-230)

2.4.11.7 Final Notification

Notify US Ecology of date of shipment, expected date of arrival, vehicle number, trailer company, freight bill number, shipper's number, drivers' names and carrier (TSMT).

Mail the fourth set of Manifests to US Ecology in order to comply with the notification requirements.

2.4.11.8 Inventory

Enter the shipment portion of the radwaste inventory program and "ship out" all drums on the shipment.

2.4.12 Procedure for Compacting Waste

2.4.12.1 Description

The system consists of the Compacting Chamber, Control Panel, Air Exhaust & Filter System, Air Sampling System and Air Supply System. A diagram of our warehouse at 103 Woodland Avenue, Westwood, New Jersey is shown in Figure III-2.1. A list of the equipment is as follows:

I. Compactor: Model 55AR-P RAM Flat with 21 CH compaction head and pneumatic controls - NEMA 4 Control Cabinet and explosion-proof motor, from S & G Enterprises

II. Air Filter: Model CRN Air System from S & G Enterprises

III. Air Supply System:

Series 605041 Portable Air Compressor and
Series 605003 Zephyair NIOSH Approved Constant flow compressed air masks.

IV. Air Sampling System:
Model AMS-3 with RAP-1 regulated pump from Eberline Corporation.

(NOTE: If the equipment listed is found to be unavailable, equivalent systems will be substituted.)

2.4.12.2 Waste

The waste to be compacted will be found in the area designated by floor markings in drums labeled DCS and DCR. Double check for labeling prior to opening drum.

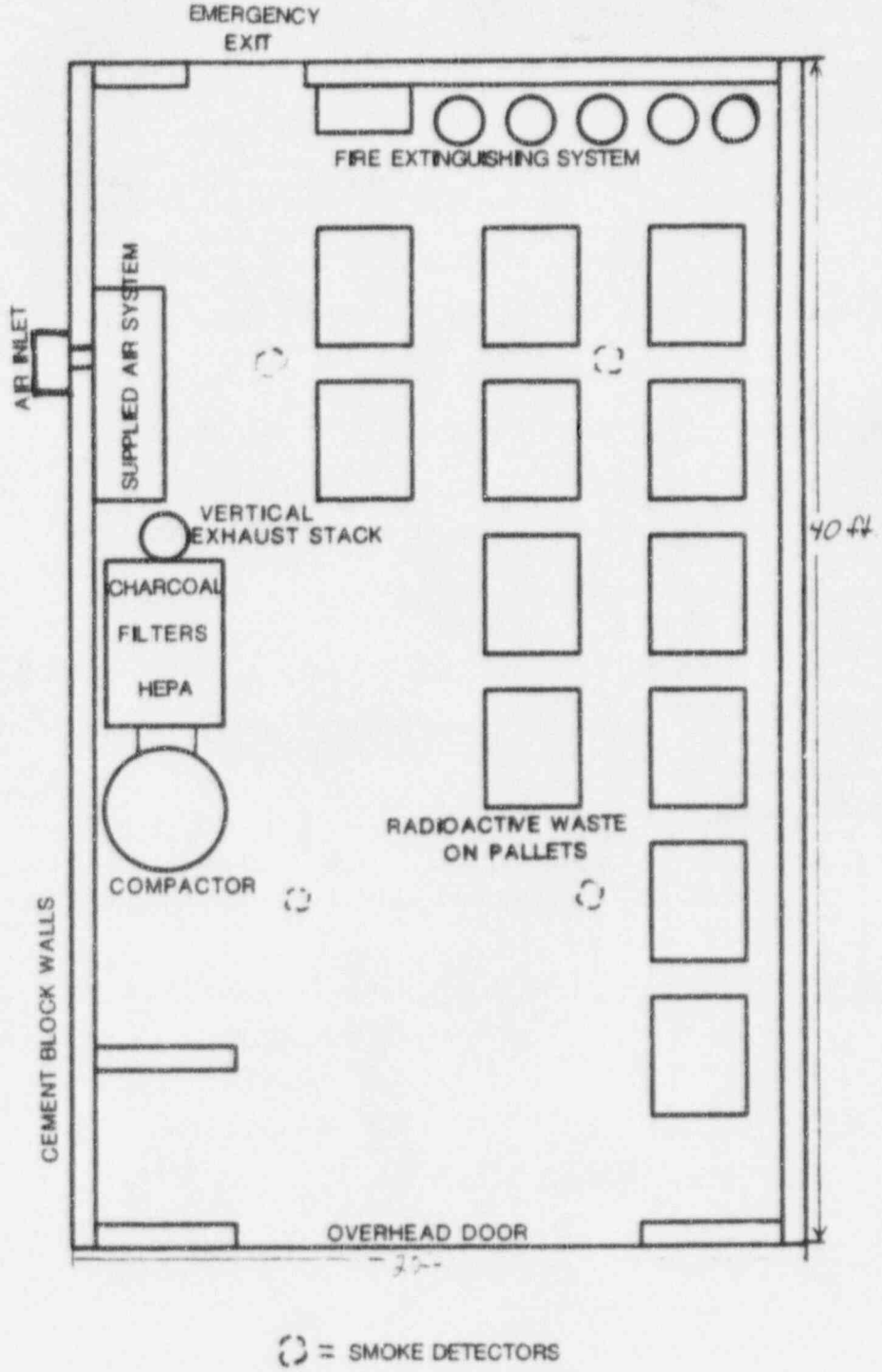
2.4.12.3 Procedure

1) Put on protective clothing: disposable coveralls, rubber boots and/or shoe covers, and vinyl gloves.

2) Turn on air supply system and put on respirator.

3) Select a DCR or DCS container.

Figure III-2.1



4) Inspect container for deformations, rust and holes. Any drum found unsatisfactory will not be used for compaction.

5) Place container onto drum dolly.

6) Remove cover.

7) Place into compaction chamber and close door.

8) Turn ON air sampling system and let it run until all compactions for the day are completed.

9) Turn ON compactor and let it cycle.

10) Enter on RadWaste Composite Compaction List (Form IWL-RW-216) the drum identification and generator id number.

11) Upon completion of cycle, select a new container and open.

12) Remove waste intact in the double 4 mil liners and place into the drum which is already in the compactor.

NOTE: If the waste from the new drum cannot <u>all</u> be compacted in the compacted drum, do <u>not</u> compact any additional waste into that drum. Seal the drum and select another drum in which to compact.

13) Continue with Step 9 until you have completed a drum.

14) Once all such drums have been compacted, all empty containers shall be swipe tested thoroughly inside and out. The swipes shall be analyzed for contamination by analysis appropriate for the isotopes contained.

15) Drums found to be clean shall have all markings and labels removed and put back into service. All drums which are found to be contaminated shall be decontaminated and resurveyed. The limits for contamination are as detailed in the US Nuclear Regulatory Commission's publication on the Decontamination of Facilities and Equipment prior to Release for Unrestricted Use or Termination of License for Byproduct, Source or Special Nuclear Material.

16) The decontamination area will consist of an area designated in the warehouse adjacent to the compaction area. It will have strippable paint applied to the surface which will be surveyed after each decontamination. Acceptable levels are as follows:

Fixed activity limits:

- Gross Alpha - 0.5 mR/hr at contact
- Gross Beta - 0.5 mR/hr at contact

Removable activity limits:

- Gross Alpha - 100 dpm/100 cm^2
- Gross Beta - 500 dpm/100 cm^2
- Tritium - 1000 dpm/100 cm^2

17) Drums which have been completely compacted will be prepared for shipment. They will either be stored in the warehouse or loaded onto the transport vehicle.

18) General Notes:

- Only the compacted drum and one (1) other drum will be opened at any one time.
- If a drum interior cannot be decontaminated to the designated levels, it will be used as a compaction drum.
- There should be little chance of contamination as the waste will be contained within 8 mil of plastic (two 4 mil liners).
- The air will be monitored continuously by the use of the Eberline AMS-3 air monitoring system during all compaction operations.
- Any changes made concerning supplied air must be approved by the US Nuclear Regulatory Commission.
- Filters will be changed on the CRN filter system at intervals recommended by the manufacturer or at intervals indicated by monitoring results.
- The filter system is set up to exhaust to the outside of the building.
- If there is any indication that a container has broken bags or other unsafe conditions, it will be resealed and shipped for burial as either a DMS or DMR drum.
- Any decontamination materials will be placed in to 4 mil plastic bags and stored in a 30 gallon container for compaction at some future time.
- For training, see Section III-2.3.13.

III-2.5 *Procurement of Supplies Related to Radioactive Waste Disposal*

The objective of this program is to assure that the materials and equipment meet with the specifications required by the NRC, DOT and/or burial site. Verification that what was ordered was actually received is performed by signing for the material on the packing slip which accompanies the shipment.

2.5.1 The drums are to be in compliance with DOT specification 7A. All drums ordered must be DOT 17H, DOT 17C, or DOT 6J. This is referenced on the Purchase Order and a copy of the same is to be kept on file by the Manager of the Radiological Services Department.

2.5.2 The absorbant used is one which is approved by the State of Washington for use at the US Ecology burial facility.

2.5.3 The poly liners ordered are to be a minimum of 4 mils thick. This is to be referenced on the Purchase Order, a copy of which is to be kept on file by the Manager of the Radiological Services Department.

III-2.6 *Management - Controlled Audits of Radioactive Material Packaging and Transport Activities*

Audits are required to maintain control and monitor compliance with company policy and regulatory agencies. Included in this Section are standardized auditing forms to comply with the auditing requirements.

2.6.1 These audits will be performed annually for each licensed activity which generates radioactive waste for disposal.

2.6.2 These audits will be performed by a sub-committee appointed by the the Chairman of the Radiation Safety Committee, comprised of at least two of the following:

- Dr. D. F. Schutz, Chairman, Radiation Safety Committee
- The Radiation Safety Officer
- The Alternate Radiation Safety Officer
- Any member of the Radiation Safety Committee

2.6.3 A checklist (Form IWL-RW-228) will be completed by the committee during a meeting with the manager or supervisor of the area of activity. The checklist is designed to establish quality assurance for:

- Documentation
- Training and Supervision
- Operating Procedures
- Working Conditions

2.6.4 Based on the entries on Form IWL-RW-228, an Evaluation of Audit (Form IWL-RW-229) is then completed. Actions required, actions completed, acceptance of audit, etc. are documented and then reviewed by the Radiation Safety Committee if appropriate.

2.7.1 Warehouse Survey - The warehouse is to be surveyed for both direct radiation levels and removable contamination approximately once each week. See limits for contamination listed in Section III-2.7.3. In addition to this routine survey, anytime a drum which has a radiation level in excess of 10 mR/hr at the surface is placed into the warehouse, an additional survey will be performed to determine that the radiation levels at the exterior of the building do not exceed 0.5 mR/hr @ six (6) inches.

2.7.2 Warehouse Air - The warehouse air will be sampled whenever compaction is being done. It will be analyzed for I-125, I-131, H-3, C-14, Gross Alpha and Gross Beta, if applicable. A sampler equipped with a charcoal filter, a millipore filter, and a bubbler will be used when required.

Air sampling will be performed at two locations: 1) in the vertical exhaust stack and 2) in the area the operator will usually occupy. The air sample for the effluent will be made by means of inserting copper tubing into the compactor exhaust duct after the filter, and making a downward bend. The average stack velocity (ASV) will be determined using the "center of equal area" technique. The tube will be placed at a point equalling the ASV. Using the ASV, the volume flow (CFM), and the velocity of the air sampling pump, the inside diameter of the sampling tube head will be determined. Note: based on an ASV of 800 CFM, a duct of 9" diameter and sampling pump rate of 1 CFM, the inside diameter of the sample tube would be approximately 5/16".

For the personnel sampler, sufficient volume flow will be used to detect, at a minimum, 10% of the values found in 10CFR Part 20 Appendix B for the major isotopes present. The instruments used to count the samples are Eberline models SAC-4 and MS-2, and Intertechnique Model SL-30. The SAC-4 alpha scintillation counter will be used for gross-alpha, the MS-2 gas proportional counter for gross beta, and the SL-30 liquid scintillation counter for C-14 and H-3. The charcoal tube will be analyzed for radioactive iodines by Teledyne Isotopes radiochemistry lab. All instruments are calibrated using standard sources traceable to the National Bureau of Standards (NBS).

2.7.3 Environmental Monitoring - Environmental TLD's are placed on the fence surrounding the building on each side at the closest point to the warehouse. These are evaluated every 3 months.

2.7.4 Vehicle Surveys - Vehicles used to transport radioactive material will be surveyed at least monthly for both direct and removable contamination. Limits are as follows:

Fixed:

Gross Alpha - 0.5 mR/hr @ 1 cm
Gross Beta - 0.5 mR/hr @ 1 cm

Removable:

Gross Alpha - 100 dpm/100 cm^2
Gross Beta - 500 dpm/100 cm^2
Tritium - 1000 dpm/100 cm^2

III-2.8 *Operation of Automatic Fire System at Radioactive Storage Warehouse*

2.8.1 In the event of fire or smoke detection, the following sequence of events will occur:

2.8.1.1 Alarms inside and outside will ring.

2.8.1.2 The warehouse door will close, the natural gas supply to the heat will be cut off, and exhaust fan will stop operating.

2.8.1.3 Approximately 40 seconds time will elapse before CO2 is released to extinguish fire.

2.8.1.4 The fire department is notified.

2.8.2 In the event that you are in the warehouse when the alarm sounds you should do one of the following:

2.8.2.1 Go to the emergency exit located at the left rear corner of the warehouse and;

2.8.2.2 If you suspect that there is a fire, exit immediately and;

2.8.2.3 Wait to direct fire department and notify the safety officer or company operator as soon as possible.

2.8.3 If the system has been inadvertently triggered by smoke from a vehicle you can stop the system CO2 release by:

2.8.3.1 Moving the timer control switch from "normal" to "hold " on box #2. The hold switch will hold the system indefinitely and reset the timer to 40 seconds.

2.8.3.2 Slide the reset button in box #1 to the reset position. Alarm switch to silence.

2.8.3.3 When the alarm stops you can now move the "hold " switch to "normal " and the "alarm" switch to "normal". The system is now reset.

2.8.3.4 Call the police to cancel the false alarm.

2.8.4 SPECIAL NOTES:

2.8.4.1 Never park any of the diesel powered vehicles close to the warehouse door with the engine operating, this has been know to trigger the system.

2.8.4.2 If a fire is detected and the system does not function, there is a manual pull station located on the outside wall of the warehouse on the right side. The system will follow the same sequence as above.

2.8.4.3 Should the system become operational while you are outside of the warehouse, do not enter for any reason.

2.8.4.4 Police: 664-7000
2.8.4.5 Fire: 664-7007

RSC/QCM 4.80

	Date	Approved
Rev'd:		
Revs'd:		

III-2.9 *Forms Used in Describing and Controlling Radioactive Waste*

DESCRIPTION	FORM NO.	ACTION
Certification of Radiation Survey	IWL-RW-201	Issued 3/80
Diagram of Survey Area (Truck)	IWL-RW-202	Issued 3/80
Radioactive Waste Delivery/Pickup Form	IWL-RW-203	Issued 3/80
Radioactive Waste Certification Statement	IWL-RW-204	Issued 3/80
Retraining of Personnel Regarding Processing of Generated Waste	IWL-RW-206	Issued 3/80
Checklist for Radioactive Waste Pickup	IWL-RW-207	Issued 3/80
Retraining DOT, NRC	IWL-RW-208	Issued
Radioactive Waste Shipment Checklist	IWL-RW-210	Issued 7/80
Shipment Record	IWL-RW-212a	Revised 6/88
Exclusive Use Statement	IWL-RW-214	Issued
State of Washington Certification	IWL-RW-215	Issued 6/80
RadWaste Composite Compaction List	IWL-RW-216	Issued 7/82
Application for Employment	IWL-RW-217	Issued 4/80
Statement of Violations	IWL-RW-218	Issued 4/80
Inquiry to State Agency	IWL-RW-219	Issued 4/80
Written Examination for Drivers (DOT) pg. 1-4	IWL-RW-220	Issued 4/80
Certification of Written Examination	IWL-RW-221	Issued 4/80
Driver Road Test	IWL-RW-222	Issued 4/80
Physical Examination	IWL-RW-223	Issued 4/80
Physical Certification	IWL-RW-223	Issued
Radioactive Waste Procedures Exam - 3 pages	IWL-RW-224	Issued 4/80
Annual Review of Driving Record	IWL-RW-225	Issued 4/80
Statement of Certification	IWL-RW-227	Issued 7/82
RAM Packaging & Transportation Audit Checklist	IWL-RW-228	Issued 12/80
Review & Evaluation of Radioactive Materials Activities Audit	IWL-RW-229	Issued 12/80
Burial Certification	IWL-RW-230	Issued 11/81
Packaging of Radioactive Waste Examination 2 pages	IWL-RW-231	Issued
User Request Form	IWL-HP-06	Issued 4/80
HP Basic Training Record	IWL-HP-07	Issued 4/80

TELEDYNE ISOTOPES

CERTIFICATE OF RADIATION SAFETY SURVEY

THIS IS TO CERTIFY THAT A SURVEY WAS PERFORMED TO DETERMINE RADIATION LEVELS AND FOR COMPLIANCE WITH U.S. DOT AND U.S. NRC REQUIREMENTS

Location: _____

_____

_____

_____

Date of Survey: _____

Surveyed By: _____

Survey Instrument: _____

Serial Number: _____

Calibrated on: _____

(Note: See diagram of surveyed area for results of the survey.)

TELEDYNE ISOTOPES

Approved: _____

Title: _____

Date: _____

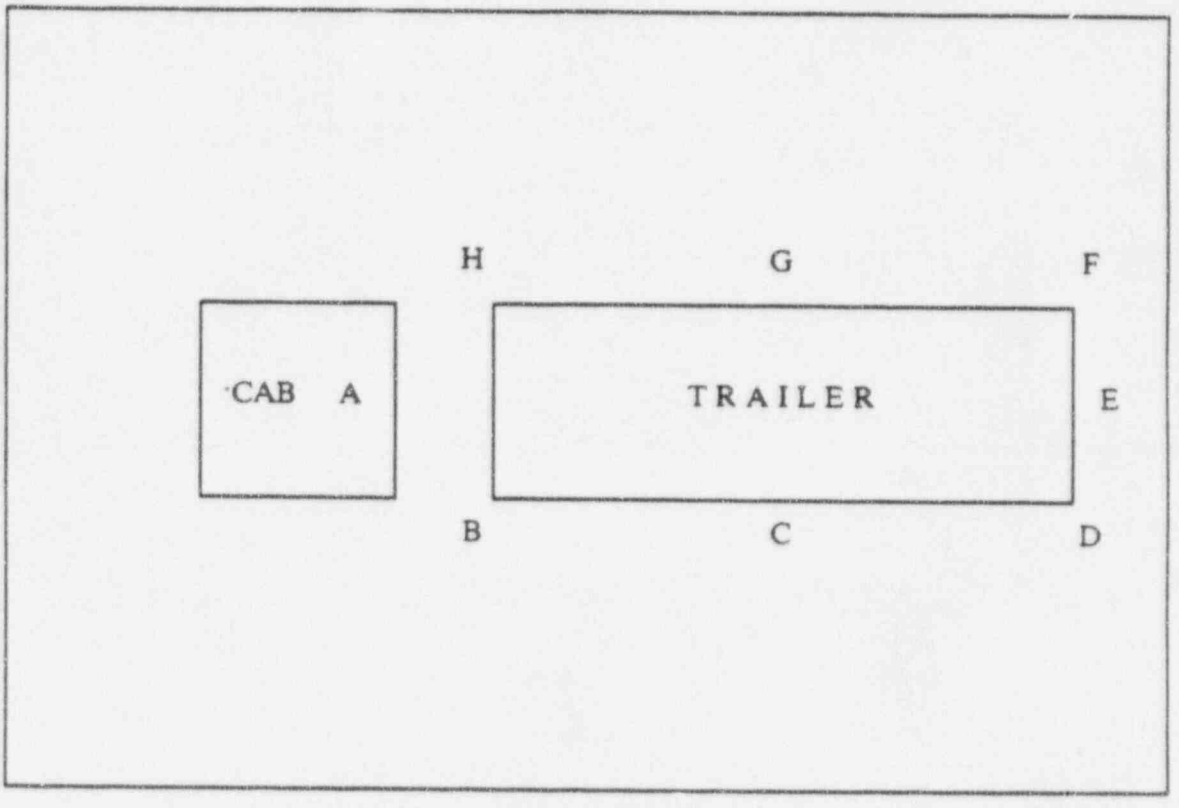
Form IWL-RW-201 issued 3/80; revised 10/87

TELEDYNE ISOTOPES

DIAGRAM OF SURVEYED AREA

Carrier: _____

Date: _____



RESULTS

Location	mR/hr @ contact	mR/hr @ 1 meter
A in cab		
B		
C		
D		
E		
F		
G		
H		

TELEDYNE ISOTOPES

DATE: _____ DATE COMPLETED: _____

CUSTOMER: _____ USER PERMIT: _____

_____ GENERATOR #: _____

_____ PO NUMBER: _____

_____ TELEPHONE #: _____

_____ BUILDING #: _____

CONTACT: _____ ROOM #: _____

DELIVER		PICKUP	
5-gal pail		5-gal pail	
30-gal drum		30-gal drum	
55-gal drum		55-gal drum	
55-gal ACR		crates	
55-gal LVR		SPECIAL INSTRUCTIONS	
55-gal 'S' drums			
55-gal 'V' drums			
5-gal liners			
30-gal liners			
55-gal liners			
Security Seals			
Absorbant			
Labels			
Rings (size)			

Form IWL-RW-203 revised 1/88

TELEDYNE ISOTOPES

ATTACHMENT A

RADIOACTIVE WASTE CERTIFICATION STATEMENT

Certification is hereby made that the containers identified on the Radioactive Waste Shipping Manifest listed below have been packaged and labelled in accordance with Teledyne Isotopes' Radioactive Waste Disposal Agreement and Teledyne Isotopes' packaging instructions dated 8/87.

Facility: _____

Printed Name: _____

Signature: _____

Title: _____

Date: _____

Radioactive Shipping Manifests:	US DOT Proper Shipping Name:

TELEDYNE ISOTOPES

RETRAINING OF PERSONNEL
REGARDING PROCESSING OF GENERATED WASTE

DATE: / / INSTRUCTOR:

ATTENDEES: _____

_____

_____

_____

_____

SUBJECT OUTLINE:

RSC/QCM 4.80

	Date	Approved
Rev'd:		
Revs'd:	8/88	

TELEDYNE ISOTOPES

CHECKLIST FOR RADIOACTIVE WASTE PICKUP

Table A

Health Physics Equipment

1) TLD Badge
2) GM Survey Meters:
   1 - 50 mR/hr range with thin end window (e.g. E-120)
   1 - 1000 mR/hr range (e.g. E-130G)
3) Filter papers or other absorbant paper

Table B

Department of Transportation Equipment

1) Driver's Log Book
2) Radioactive Waste Delivery/Pickup Forms
3) Radioactive Waste Manifest Forms
4) Appropriate maps
5) Work gloves
6) Miscellaneous equipment (e.g. Security Seals, ratchet wrench, waste manifest forms, screwdriver, portable 5-gallon pail sealing tool, labels: Rad I, II, and III, Flammable Liquid, etc., cash, credit cards, nuts, bolts, marker, pens, etc.).

TELEDYNE ISOTOPES

RETRAINING OF PERSONNEL REGARDING NRC, D.O.T., WASTE BURIAL REQUIREMENTS

DATE: / / INSTRUCTOR:

ATTENDEES: _____

_____

_____

_____

_____

_____

_____

_____

SUBJECT OUTLINE:

RSC/QCM 4.80

	Date	Approved
Rev'd:		
Revs'd:		

ISOTOPES

RADIOACTIVE WASTE SHIPMENT CHECKLIST

DRUM ID # (DR#)	RING & BOLT SECURED & THREAD INTERRUPTED	LABELED OR MARKED (RAD I, II, III LSA, etc.)	ID # (TRKDR#) DURABLY & LEGIBLY MARKED	mR/hr READINGS ACCURATE	CONTAMINATION (dpm/100 cm^2) ACCURATE	LOADED ON TRUCK (Trailer No.)

Shipment #_____ SHIPMENT RECORD FORM page _____ of _____ pages

MANIFEST	PG	5	30	55	OTHER	UN #	H-3	C-14	Tc-99	I-129	SNM gms	S. kgs	Total mCi

Form IW[illegible]V-212a issued 3/88

TELEDYNE ISOTOPES

EXCLUSIVE USE STATEMENT

T.I. Shipment No._____ Trailer No._____

This vehicle is consigned exclusive use. Loading and unloading of contents must be conducted by the consignor or the consignee or his designated agent. Any shifting of the load must be approved by the undersigned prior to movement. Placards have been applied and are not to be altered under any condition. Any change of equipment requires notification of the undersigned prior to movement of the vehicle.

IN AN EMERGENCY:

During office hours: Call 201-664-7070 (8:00 a.m. to 5:00 p.m. EST) Ask for Steven Black or Hector Martos.

After hours: Call TSMT Radioactive Dispatch @ 800-641-7580. They will contact us.

The Security Seal numbers used on this shipment are TI_____.

If there are any discrepancies upon arrival at destination, please notify us.

Thank you.

TELEDYNE ISOTOPES

SAB:jk

Steven A. Black, R.S.O.

Form IWL-RW-214 Revised 1/21/85

DEPARTMENT OF SOCIAL AND HEALTH SERVICES
OLYMPIA, WASHINGTON

LOW-LEVEL RADIOACTIVE WASTE SHIPMENT CERTIFICATION FOR
COMMERCIAL GENERATOR/PACKAGERS, AND BROKERS AND CARRIERS

The following certification, completed as applicable, is made to the State of Washington:

Certification is hereby made to the State of Washington that Radiation Shipment Record No. _____ of low-level radioactive waste has been inspected in accordance with requirements of the Governor of Washington's Executive Order dated November 19, 1979, prior to its shipment. Further certification is made that the inspection has revealed no items of non-compliance with all applicable laws, rules and regulations.

The undersigned shall indemnify and hold harmless the State of Washington, in an amount not to exceed $1,000,000.00 per individual who may be injured, provided that indemnification shall not exceed $5,000,000.00 in total, for each occurrence, from any and all claims, suits, losses, damage, injury and expenses to any person whomsoever or to property arising or growing out of or in any manner connected with the activities performed under this order.

Except for any violation of applicable existing state or federal statute or regulation respecting packaging and shipment, inspection and acceptance of any item, or container or material covered by this certification by the State of Washington or a duly authorized contractor shall release the party who executed this certificate from any and all requirement of indemnification from injury or loss.

SECTION A:
FOR THE GENERATOR/PACKAGER: TELEDYNE ISOTOPES (See attached sheet)
(Company Name)

PERMIT NUMBER: 6870

VOLUME OF WASTE IN THIS SHIPMENT: _____ cubic feet

DATE: _____ BY: _____

TITLE: _____

SECTION B:
FOR THE BROKER: TELEDYNE ISOTOPES
(Company Name)

PERMIT NUMBER: 6870

VOLUME OF WASTE IN THIS SHIPMENT: _____ cubic feet

DATE: _____ BY: _____

TITLE: _____

SECTION C:
FOR THE CARRIER: TRI STATE MOTOR TRANSIT
(Company Name)

VOLUME OF WASTE IN THIS SHIPMENT: _____ cubic feet

DATE: _____ BY: _____

TITLE: _____

DSHS RHF-31A
DSHS 13-424 (3/80)

Form No. IWL-RW-215 revised 6/80

RAD WASTE COMPOSITE COMPACTION LIST

Compaction Container ID	Original Container ID	Generator ID Number	Date Compacted

Technician _____

Date Signed _____

Logged By _____

Date Logged _____

IWL-RW-216 Issued: 07/82

For Personnel Department Use Only

Position(s) Applied For Is Open: ☐ Yes ☐ No

Date_____

List below all accidents you were involved in during the last 3 years:

Date	Nature of Accident	Fatalities	Personal Injury

List the valid vehicle licenses in your possession:

Chauffer's License: Issued by state of_____ Number_____ Expires_____
Operator's License; Issued by state of_____ Number_____ Expires_____
Driver's License: Issued by state of_____ Number_____ Expires_____

Have you ever lost your driving privileges? Explain_____

MOTOR VEHICLE DRIVER'S CERTIFICATION

I certify that the following is a true and complete list of traffic violations (other than parking violations) for which I have been convicted or forfeited bond or collateral during the past 36 months.

Date	Offense	Location	Type Vehicle Operated

If no violations are listed above, I certify that I have not been convicted or forfeited bond or collateral on account of any violation required to be listed during the past 36 months.

_____ DATE OF CERTIFICATION

_____ DRIVER'S SIGNATURE

_____ MOTOR CARRIER'S NAME

_____ MOTOR CARRIER'S ADDRESS

_____ REVIEWED BY: SIGNATURE

_____ TITLE

EMPLOYMENT DESIRED: Position_____ Date you can start_____

Salary_____ Are you employed now?____ If so, may we inquire of present employer?

_____ We may contact prior employers as required by 391.23 (US DOT).

Experience: (Explain experience you have for the above desired position. If you operated motor vehicle equipment explain types and states driven in.

Do you have full knowledge of the Federal Safety Requirements?_____

Form IWL-RE-217 issued: 3/80

detach 1

TELEDYNE ISOTOPES

STATEMENT OF VIOLATIONS

(TO BE COMPLETED PRIOR TO HIRING AND ANNUALLY)

I certify that the following is a true and complete list of traffic violations (other than parking violations) for which I have been convicted or forfeited bond or collateral during the past 12 months.

Date	Offense	Location	Type of Vehicle Operated

If no violations are listed above, I certify that I have not been convicted or forfeited bond or collateral on account of any violation required to be listed during the past 12 months.

Date of Recertification

Driver's Signature

Motor Carrier's Name

Motor Carrier's Address

Reviewed by: Signature

Title

TELEDYNE ISOTOPES

INQUIRY TO STATE AGENCY FOR DRIVER'S RECORD

_____
(Driver's Name)

_____
(Driver's Operators Lic. No.)

_____
(Driver's Social Sec. No.)

Dear Sir:

The above listed individual has made application with us for employment as a driver. He has indicated that the above numbered operators license or permit has been issued by your State to him and that it is in good standing.

In accordance with Section 391.23 (a) (1) and (b) of the Federal Motor Carrier Safety Regulations we are required to make inquiry into the driving record during the preceeding 3 years of every State in which an applicant-driver has held a motor vehicle operations license or permit during those three years.

Therefore, please certify to us what the individual's driving record is for the preceeding 3 years, or certify that no driving record exists if that be the case.

In the event that this inquiry does not satisfy your requirements for making such inquiries, please send us such forms of yours as are necessary for us to complete our inquiry into the driving record of this individual.

Respectfully yours,

_____
Signature of individual making inquiry

_____
Motor Carrier Name Street City State Zip

_____ _____
Name of person Making inquiry Title

FORM IWL-RW-219 ISSUED 4/1/80

REV EFF 10/1/74

APPENDIX C—WRITTEN EXAMINATION FOR DRIVERS

INSTRUCTIONS

All of the questions contained herein are based on the United States Department of Transportation's Federal Motor Carrier Safety Regulations. Applicants for the position of commercial driver are required to take the examination.

Each question has four answers but only one is right. Your job on each question is to read all of the answers and then to pick the one answer you think is right. Mark an "X" in the space next to the answer you choose. Do not pick more than one answer for each question.

Here is a sample question to show you what is to be done:

The Federal Motor Carrier Safety Regulations were written for:

1. ( ) vehicle makers.
2. ( ) drivers only.
3. ( ) carriers only.
4. ( ) drivers and carriers.

The right answer is number 4, "drivers and carriers," so you would mark an "X" in the space next to answer number 4.

Finally, be sure to answer every question and do not skip any pages. Keep in mind that most of the Regulations covered here are different from what is required of passenger car drivers; they apply to commercial bus and truck drivers. Again, pick only one answer for each question. There is no time limit on the examination, but try to work as fast as you can.

1. 390.32 A motor carrier who is also a driver (owner-operator):

1. ( ) is not covered by the safety regulations.
2. ( ) must obey only those parts of the regulations which cover drivers.
3. ( ) must obey only those parts of the regulations which cover motor carriers.
4. ( ) must obey both the parts covering drivers and the parts covering motor carriers.

2. 391.11(b)(1) With only a few exceptions, the Federal Motor Carrier Safety Regulations say a driver must be:

1. ( ) at least 18 years old.
2. ( ) at least 19 years old.
3. ( ) at least 20 years old.
4. ( ) at least 21 years old.

3. 391.15(c)(2)(3) A driver cannot drive a motor vehicle:

1. ( ) For one year after a first offense conviction for a felony involving a commercial motor vehicle he was driving.
2. ( ) For one year after a first offense conviction for driving a commercial vehicle under the influence of alcohol or narcotics.
3. ( ) For one year after a first offense conviction for leaving the scene of an accident which resulted in personal injury or death.
4. ( ) For one year after a first offense conviction for any of the above.

4. 391.21(b)(7)(8)(10) Every driver applicant must fill out an application form giving:

1. ( ) a list of all vehicle accidents he was in during the previous 5 years.
2. ( ) a list of all of his motor vehicle violation convictions and bond forfeits (except for parking) during the previous 3 years.
3. ( ) a list of names and addresses of all of his employers during the previous 3 years.
4. ( ) all of the above.

5. 391.27(a)(b) At least once a year, a driver must fill out a form listing all motor vehicle violations (except parking) which he had during the previous 12 months. He must fill out the form:

1. ( ) even if he had no violations.
2. ( ) only if he was convicted.
3. ( ) only if he was convicted or forfeited bond or collateral.
4. ( ) only if the carrier requires it.

6. 391.33(a)(2) If a driver applicant has a valid certificate showing he passed a driver's road test:

1. ( ) the carrier must accept it.
2. ( ) the carrier may still require the applicant to take a road test.
3. ( ) the carrier cannot accept it.
4. ( ) the carrier may request a road test waiver from the Bureau of Motor Carrier Safet

7. 391.41(b)(5) Persons with breathing problems which may affect safe driving:

1. ( ) cannot drive.
2. ( ) cannot drive unless the vehicle has an emergency oxygen supply.
3. ( ) cannot drive unless another driver is along.
4. ( ) cannot drive except on short runs.

8. 391.41(b)(7) Persons with arthritis, rheumatism, or any such condition which may affect safe driving:

1. ( ) cannot drive unless they are checked by a doctor before each trip.
2. ( ) cannot drive.
3. ( ) cannot drive except when they are free of pain.
4. ( ) cannot drive unless another driver is along.

9. 391.41(b)(8) Persons who have ever had epilepsy:

1. ( ) cannot drive unless another driver is along.
2. ( ) cannot drive.
3. ( ) cannot drive on long runs.
4. ( ) cannot drive without monthly medical examinations.

10. 391.41(b)(9)(12)(13) In order to be able to drive, a person:

1. ( ) must not have any mental, nervous or physical problem likely to affect safe driving.
2. ( ) must not use an amphetamine, narcotic or any habit-forming drug.
3. ( ) must not have a current alcoholism problem.
4. ( ) must not have or use any of the above.

11. 391.45(c) Any driver who gets an injury or illness serious enough to affect his ability to perform his duties:

1. ( ) must report it at his next scheduled physical.
2. ( ) cannot drive again.
3. ( ) must take another physical and be recertified before driving again.
4. ( ) must wait at least 1 month after recovery before driving again.

12. 392.2 A driver may not drive faster than posted speed limits:

1. ( ) unless he is sick and must complete his run quickly.
2. ( ) at any time.
3. ( ) unless he is passing another vehicle.
4. ( ) unless he is late and must make a scheduled arrival.

13. 392.3 When a driver's physical condition while on a trip requires that he stop driving, but stopping would not be safe, the driver:

1. ( ) must stop anyway.
2. ( ) may try to complete his trip, but as quickly as possible.

3. ( ) may continue to drive to his home terminal.
4. ( ) may continue to drive, but must stop at the nearest safe place.

14. 392.8(a)(1) A driver may not drink or be under the influence of any alcoholic beverage (regardless of alcoholic content):
1. ( ) within 4 hours before going on duty or driving.
2. ( ) within 6 hours before going on duty or driving.
3. ( ) within 8 hours before going on duty or driving.
4. ( ) within 12 hours before going on duty or driving.

15. 392.7 A driver must satisfy himself that service and parking brakes, tires, lights and reflectors, mirrors, coupling and other devices are in good working order:
1. ( ) at the end of each trip.
2. ( ) before the vehicle may be driven.
3. ( ) only when he considers it necessary.
4. ( ) according to schedules set by the carrier.

16. 392.8 Which of the following must be in place and ready for use before a vehicle can be driven?
1. ( ) at least one spare fuse or other overload protector of each type used on the vehicle.
2. ( ) a tool kit containing a specified list of hand tools.
3. ( ) at least one spare tire for every four wheels.
4. ( ) a set of spark plugs.

17. 392.9(a)(3) If any part of the cargo or anything else blocks a driver's front or side views, his arm or leg movements, or his access to emergency equipment, the driver:
1. ( ) can drive the vehicle, but must report the problems at the end of the trip.
2. ( ) cannot drive the vehicle.
3. ( ) can drive the vehicle, but only at speeds under 40 miles per hour.
4. ( ) can drive the vehicle, but only on secondary roads.

18. 392.9(a) Any driver who needs glasses to meet the minimum visual requirements:
1. ( ) must drive only during daylight hours.
2. ( ) must always wear his glasses when driving.
3. ( ) must always carry a spare pair of glasses.
4. ( ) must not drive a motor vehicle.

19. 392.9(b) A driver may drive with a hearing aid:
1. ( ) if he always has it turned on while he is driving.
2. ( ) if he always carries a spare power source for it.
3. ( ) if he can meet the hearing requirements when he has it turned on.
4. ( ) if all of the above requirements are met.

20. 392.10(a) A driver required to stop at a railroad crossing should bring his vehicle to a stop no closer to the tracks than:
1. ( ) 5 feet.
2. ( ) 10 feet.
3. ( ) 15 feet.
4. ( ) 20 feet.

21. 392.10(a) Shifting gears is not permitted:
1. ( ) when traveling faster than 35 miles per hour.
2. ( ) when moving across any bridge.
3. ( ) when crossing railroad tracks.
4. ( ) when traveling down a hill steeper than 10 degrees.

22. 392.13 Drivers of motor vehicles not required to stop at drawbridges without signals:
1. ( ) must drive at a rate of speed which will permit a stop before reaching the lip of the draw.
2. ( ) must sound their horn before crossing.
3. ( ) can proceed across without reducing speed.
4. ( ) must slow down only if directed to by an attendant.

23. 392.15(a) A driver turning his vehicle should begin flashing his turn signal:
1. ( ) at least 50 feet before turning.
2. ( ) at least 60 feet before turning.
3. ( ) at least 75 feet before turning.
4. ( ) at least 100 feet before turning.

24. 392.16 Which of the following is true?
1. ( ) if a seat belt is installed in the vehicle, a driver must have it fastened before beginning to drive.
2. ( ) a driver may or may not use the seat belt, depending on his judgment.
3. ( ) seat belts are not necessary on heavier vehicles.
4. ( ) a driver must use his seat belt only if required to by the carrier.

25. 392.21 When a motor vehicle cannot be stopped off the traveled part of the highway, the driver:
1. ( ) must keep driving.
2. ( ) may stop, but shall get as far off the traveled part of the highway as possible.
3. ( ) may stop, but shall make sure that the vehicle can be seen as far as possible to its front and rear.
4. ( ) may stop if he has to, but should do both 2 and 3 above.

26. 392.22(b)(1) If a vehicle has a breakdown the driver must place one emergency signal:
1. ( ) 100 feet in front of the vehicle in the center of the lane it occupies.
2. ( ) 100 feet in back of the vehicle in the center of the lane it occupies.
3. ( ) 10 feet in front or back of the traffic side.
4. ( ) at all of the above locations.

27. 392.22(b)(1)(i) If a vehicle has a breakdown on a poorly-lit street or highway, the driver shall place on the traffic side:
1. ( ) a reflective triangle.
2. ( ) a lighted red electric lantern.
3. ( ) a red reflector.
4. ( ) any one of the above.

28. 392.22(b)(2)(iii) No emergency signals are required for a vehicle with a breakdown if the street or highway lighting is bright enough so it can be seen at a distance of:
1. ( ) 100 feet.
2. ( ) 200 feet.
3. ( ) 500 feet.
4. ( ) 750 feet.

29. 392.22(b)(2)(v) If a vehicle has a breakdown and stops on a poorly-lit *divided or one way* highway, the driver must place one emergency signal:
1. ( ) 200 feet in back of the vehicle in the center of the lane it occupies.
2. ( ) 100 feet in back of the vehicle on the traffic side of the vehicle.
3. ( ) 10 feet in back of the vehicle on the traffic side of the vehicle.
4. ( ) at all of the above locations.

30. 392.25 Lighted flame-producing emergency signals, including fuses:
1. ( ) may not be used with vehicles carrying Class A or B explosives.
2. ( ) may not be used with tank vehicles, loaded or empty, which are used to carry flammable liquids or gas.
3. ( ) may not be used with any vehicle using compressed gas as a fuel.
4. ( ) may not be used with any of the above.

31. 392.30(a) A driver is required to have his lights on:
1. ( ) from one-half hour *before* sunset to one-half hour before sunrise.
2. ( ) from one-half hour before sunset to sunrise.
3. ( ) from one-half hour *after* sunset to one-half hour *before* sunrise.
4. ( ) from sunset to one-half hour before sunrise.

32. 392.32(a)(b) When lights are required on the open highway, a driver shall use the high beam:
1. ( ) except when within 500 feet of an on-coming vehicle or a vehicle he is following.
2. ( ) except when within 400 feet of an on-coming vehicle or a vehicle he is following.
3. ( ) except when within 200 feet of an on-coming vehicle or a vehicle he is following.
4. ( ) except when within 100 feet of an on-coming vehicle or a vehicle he is following.

33. 392.32(a) When lights are required, drivers may use lower beam lights:
1. ( ) when fog, dust or other such conditions exist.
2. ( ) when approaching tunnels or bridges.
3. ( ) when driving on one way highways.
4. ( ) when within 1,000 feet of business areas or where people live.

34. 392.40 Every driver involved in an accident must follow the Safety Regulation procedures whenever an injury or death is involved or if:
1. ( ) the accident is caused by the driver and property damage of over $250.00 results.
2. ( ) property damage of over $250.00 results, no matter who is at fault.
3. ( ) property damage of over $100.00 results.
4. ( ) property damage of any kind results.

35. 392.41 If a driver strikes a parked vehicle, he should *first*:
1. ( ) stop and call the local police.
2. ( ) stop and call his carrier.
3. ( ) stop and try to find the driver or owner of the parked vehicle.
4. ( ) stop and estimate the damage.

36. 392.42 When a driver receives notice that his operator's license or permit has been revoked, suspended, or withdrawn, he must:
1. ( ) notify his carrier within 72 hours.
2. ( ) notify his carrier within one week.
3. ( ) notify his carrier before the end of the next business day.
4. ( ) take no action since his carrier will also get a notice.

37. 392.6 Except in emergencies, no driver shall allow his vehicle to be driven by any other person:
1. ( ) except those he knows can drive it.
2. ( ) except on roads with little or no traffic.
3. ( ) except those allowed by the carrier to do it.
4. ( ) unless he goes along with the person driving.

38. 392.64 A person may ride inside a vehicle's closed body or trailer:
1. ( ) only on short runs.
2. ( ) only if there is an easy way to get out from the inside.
3. ( ) only if the inside of the body or trailer is lighted.
4. ( ) only if there is no cargo in it.

39. 392.66 If carbon-monoxide is inside a vehicle or if a mechanical problem may produce a carbon-monoxide danger, the vehicle:

1. ( ) may be sent out and driven so long as the windows are left open.
2. ( ) may not be sent out or driven.
3. ( ) may be sent out and driven only if the carrier decides the vehicle has to be used.
4. ( ) may be sent out and driven on short runs.

40. 392.68 No motor vehicle shall be operated out of gear:

1. ( ) except when fuel must be saved.
2. ( ) except on hills which are less than 20 degrees.
3. ( ) except when it is necessary for stopping or shifting gears.
4. ( ) except when the vehicle's speed is under 25 miles per hour.

41. 393.1(a) Under the Federal Motor Carrier Safety Regulations, no vehicle may be driven:

1. ( ) until a list of all missing or defective equipment has been prepared and given to the carrier.
2. ( ) until all equipment has been inspected and replacements for defective parts have been ordered.
3. ( ) unless all missing equipment is to be replaced no later than the end of the vehicle's next run.
4. ( ) until it meets all of the equipment requirements of the Regulations.

42. 393 various Minimum requirements for lighting, reflecting and electrical equipment and devices on buses and trucks:

1. ( ) are set by the vehicle makers.
2. ( ) are set by the National Safety Council.
3. ( ) are specified in the Safety Regulations.
4. ( ) are set by the trucking associations.

43. 393.18(a)(b) Every motor vehicle which has a load sticking out over its sides must be specifically marked with flags and lamps. Additional flags and lamps must be added if the load or tailgate sticks out beyond the rear of the vehicle by more than:

1. ( ) 2 feet.
2. ( ) 4 feet.
3. ( ) 6 feet.
4. ( ) 8 feet.

44. 393.41(a) Every vehicle shall have a parking brake system which will hold it, no matter what its load:

1. ( ) on any grade on which it is operated which is free from ice and snow.
2. ( ) on all grades under 15 degrees which are free from ice and snow.
3. ( ) on all grades under 20 degrees which are free from ice and snow.
4. ( ) on all grades under 25 degrees which are free from ice and snow.

45. 393.77(b)(6) A portable heater may not be used in any vehicle cab:

1. ( ) unless it is secured.
2. ( ) unless it is of the electric filament type.
3. ( ) at any time.
4. ( ) without approval from the carrier.

46. 395.3(a) Drivers are not generally allowed to drive for more than:

1. ( ) 6 hours following 8 straight hours off duty.
2. ( ) 8 hours following 8 straight hours off duty.
3. ( ) 10 hours following 8 straight hours off duty.
4. ( ) 12 hours following 8 straight hours off duty.

47. 395.3(a) Most drivers of large vehicles are not allowed to drive:

1. ( ) after they have been *on duty* for 16 hours.
2. ( ) after they have been *on duty* for 15 hours.
3. ( ) after they have been *on duty* for 14 hours.
4. ( ) after they have been *on duty* for 12 hours.

48. 395.5(b) Generally, a driver may not be "on duty":

1. ( ) for more than 40 hours in any 7 straight days.
2. ( ) for more than 50 hours in any 7 straight days.
3. ( ) for more than 60 hours in any 7 straight days.
4. ( ) for more than 70 hours in any 7 straight days.

49. 395.7 When a driver is riding in a vehicle, but is not driving and has no other responsibility, such time shall be counted as:

1. ( ) on-duty time.
2. ( ) on-duty time unless he is allowed 8 straight hours off duty when he gets to the destination.
3. ( ) on-duty time unless he is allowed 6 straight hours off duty when he gets to the destination.
4. ( ) on-duty time unless he is allowed 4 straight hours off duty when he gets to the destination.

50. 395.8(b) Every driver must prepare an original and one copy of a daily log which he must keep current by updating it:

1. ( ) every time he changes a duty status.
2. ( ) every 24 hours.
3. ( ) every 8 hours.
4. ( ) at the end of each trip.

51. 395.8(c) Except for the name and main address of the carrier, all entries in a log:

1. ( ) must be printed [illegible] or typed.
2. ( ) must be made [illegible] carrier dispatcher.
3. ( ) must be made in front of a witness.
4. ( ) must be written in the driver's own handwriting.

52. 395.8(1)(p)(q) Which of the following is *not* to be put in a driver's log?

1. ( ) Time spent in a sleeper berth.
2. ( ) Total hours in each duty status.
3. ( ) The name of the carrier or carriers.
4. ( ) The name and make of his vehicle.

53. 395.11 If an emergency delays a run which could normally have been completed within hours of service limits, the driver:

1. ( ) must still stop driving when the hours of service limit is reached.
2. ( ) may drive for 1 extra hour.
3. ( ) may drive for 2 extra hours.
4. ( ) may finish his run without being in violation.

54 395.13 Any driver declared "Out of Service":

1. ( ) must take a road test before driving again.
2. ( ) must wait 72 hours before driving again.
3. ( ) must appeal to the Director of the Bureau of Motor Carrier Safety to drive again.
4. ( ) can drive again only after hours of service requirement are met.

55. 396.4 If a vehicle on a trip is in a condition likely to cause an accident or breakdown:

1. ( ) the driver should report it at the end of his run so repairs can be made.
2. ( ) the driver should drive at lower speeds for the rest of the run.
3. ( ) the driver should stop immediately unless going on to the nearest repair shop is safer than stopping.
4. ( ) the driver should change his route so as to get away from heavily traveled roads.

56 396.5(c) If authorized Federal inspectors find a vehicle which is likely to cause an accident or breakdown:

1. ( ) it will be reported to the carrier for repair as soon as the vehicle is not scheduled.
2. ( ) it will be reported to the carrier for repair at the end of the trip.
3. ( ) it will be marked with an "Out of Service Vehicle" sticker and not driven until repairs are made.
4. ( ) the driver will be held responsible and declared "Out of Service."

57. 396.5(c)(4) If the driver makes his own repairs on an "Out of Service" vehicle:

1. ( ) his work must be approved by a mechanic.
2. ( ) he must complete and sign a "Certification of Repairman" form himself.
3. ( ) his work must be approved by his supervisor.
4. ( ) his work must be approved by a Federal inspector.

58. 397.3 Department of Transportation Regulations covering the driving and parking of vehicles containing hazardous materials:

1. ( ) replace State and local laws.
2. ( ) prevent States and cities from having their own laws.
3. ( ) must be obeyed even if State or local laws are less strict or disagree.
4. ( ) should not be obeyed if State or local laws disagree.

59. 397.5(c) A vehicle which contains hazardous materials *other than* Class A or B explosives must be attended at all times:

1. ( ) by the driver.
2. ( ) by the driver except when he is involved in something else necessary to his duties as a driver.
3. ( ) by the driver or a person chosen by the driver.
4. ( ) by the driver or a police officer.

60. 397.5(d)(1) A vehicle containing Class A or B explosives or other hazardous materials on a trip is "attended":

1. ( ) when the person in charge is anywhere within 100 feet of it.
2. ( ) as long as the driver can see it from 200 feet away.
3. ( ) when the person in charge is within 100 feet and has a clear view of it.
4. ( ) when the person in charge is resting in the berth.

61. 397.7(a)(3) Except for short periods when operations make it necessary, trucks carrying Class A or B explosives cannot be parked any closer to bridges, tunnels, building or crowds of people than:

1. ( ) 50 feet.
2. ( ) 100 feet.
3. ( ) 200 feet.
4. ( ) 300 feet.

62 397.13(a) Smoking or carrying a lighted cigarette, cigar or pipe near a vehicle which contains explosives, oxidizing or flammable materials is not allowed:

1. ( ) except in the closed cab of the vehicle.
2. ( ) except when the vehicle is moving.
3. ( ) except at a distance of 25 feet or more from the vehicle.
4. ( ) except when approved by the carrier.

63 397.15(a)(b) When a vehicle containing hazardous materials is being fueled:

1. ( ) no person may remain in the cab.
2. ( ) a person must be in control of the fueling process at the point where the fuel tank is filled.
3. ( ) the area within 50 feet of the vehicle must be cleared.
4. ( ) the person who controls the fueling process must wear special clothes.

64. 397.17(a) If a vehicle carrying hazardous materials is equipped with dual tires on any axle, the driver must examine the tires:

1. ( ) at all fueling stops only.
2. ( ) only at the end of each day or tour of duty.
3. ( ) at the beginning of each trip and each time the vehicle is parked.
4. ( ) at the beginning of each trip only.

65. 397.17(c) If a driver of a vehicle carrying hazardous materials finds a tire which is overheated, he must:

1. ( ) wait for the overheated tire to cool before going on.
2. ( ) remove and replace the overheated tire, store it on the vehicle and drive on.
3. ( ) remove the tire, place it a safe distance from the vehicle and not drive the vehicle until the cause of the overheating is fixed.
4. ( ) drive slowly to the nearest repair shop and have the cause of the overheating fixed.

66. 177.823(a)(3) When required, specified hazardous materials markings or signs must be placed:

1. ( ) wherever they can be seen clearly.
2. ( ) on the sides and rear of the vehicle.
3. ( ) on the front, rear and sides of the vehicle.
4. ( ) on the front and rear bumpers of the vehicle.

Scoring Key

WRITTEN EXAMINATION

Section:	Answer
(1) 390.29	4
(2) 391.11(b)(1)	4
(3) 391.15(c)(2)(3)	4
(4) 391.21(b)(7)(8)(10)	4
(5) 391.27(a)(b)	1
(6) 391.38(2)	2
(7) 391.41(b)(5)	1
(8) 391.41(b)(7)	2
(9) 391.41(b)(8)	3
(10) 391.41(b)(9)(12)(13)	4
(11) 391.45(c)	3
(12) 392.2	2
(13) 392.3	4
(14) 392.5(a)(1)	1
(15) 392.7	2
(16) 392.8	1
(17) 392.9(a)(3)	2
(18) 392.9 a	2
(19) 392.9 b	4
(20) 392.10(a)	2
(21) 392.10(a)	2
(22) 392.13	1
(23) 392.15(a)	4
(24) 392.16	1
(25) 392.21	4
(26) 392.22(b)(1)	4
(27) 392.22(b)(1)(i)	4
(28) 392.22(b)(2)(iii)	2
(29) 392.22(b)(2)(v)	4
(30) 392.25	4
(31) 392.30(a)	2
(32) 392.33(a)(b)	1
(33) 392.33(a)	1
(34) 392.40	4
(35) 392.41	2
(36) 392.42	2
(37) 392.61	2
(38) 392.64	2
(39) 392.66	2
(40) 392.68	2
(41) 393.1(a)	4
(42) 393 various	2
(43) 393.18(a)(b)	2
(44) 393.41(a)	1
(45) 393.77(b)(6)	2
(46) 395.3(a)	2
(47) 395.3(a)	2
(48) 395.3(b)	2
(49) 395.7	2
(50) 395.8(b)	1
(51) 395.8(c)	4
(52) 395.8(1)(p)(q)	4
(53) 396.11	4
(54) 396.13	4
(55) 396.4	2
(56) 396.5(c)	2
(57) 396.5(c)(4)	2
(58) 397.3	2
(59) 397.5(c)	2
(60) 397.5(d)(1)	2
(61) 397.7(a)(3)	4
(62) 397.13(a)	2
(63) 397.15(a)(b)	2
(64) 397.17(a)	2
(65) 397.17(c)	2
(66) 177.823(a)(3)	2

TELEDYNE ISOTOPES

CERTIFICATION OF WRITTEN EXAMINATION

This is to certify that the person whose signature appears below, has completed the written examination under my supervision in accordance with the provisions of 391.35 of the Motor Carrier Safety Regulations.

_____ _____

(Signature of person taking examination) (Date of examination)

_____

(Location of Examination)

_____

(Signature of examiner)

_____

(Organization and address of examination)

NOTE: Examiner, by his signature above, indicates he has advised driver-applicant of the correct answers to any questions he failed to answer correctly.

TELEDYNE ISOTOPES

DRIVER ROAD TEST

Driver's Name _____

Social Security Number _____ Drivers License No. & State _____

Type of Unit Tested on _____
(tractor-trailer-truck-etc.)

If Passenger Carrier, Type of Bus _____ _____
(school bus-taxi-coach)

Grade driver in the below areas of operation on the basis of (E) excellent, (G) good, (F) fair and (P) poor:

1. Pretrip inspection of entire rig. _____
2. Coupling and uncoupling of rig if a combination unit. _____
3. Use of vehicle controls, (turn signals, horn, wipers, clearance lites, etc.) _____
4. Use of vehicle's safety equipment. _____
5. Operations of vehicle in traffic, (stopping, starting, passing, & concerning) _____
6. Braking and slowing vehicle without the use of normal foot brake. _____
7. Backing and parking the vehicle. _____
8. Courtesy of driver to other motorist and pedestrians. _____

This is to certify that the above named driver was given a road test under my supervision on _____ 19 _____ consisting of _____ miles driving.

It is my considered opinion that this driver passed sufficient driving skills to operate the type of commercial motor vehicle listed above.

_____ _____
SIGNATURE OF EXAMINER TITLE

_____
ORGANIZATION AND ADDRESS OF EXAMINER

PHYSICAL EXAMINATION OF DRIVERS

Name: _____

Address: _____

Social Security No.: _____ Date of Birth: _____ Age: _____

☐ New Certification ☐ Recertification

HEALTH HISTORY

Yes	No		Yes	No	
☐	☐	Head or spinal injuries.	☐	☐	Nervous stomach
☐	☐	Seizures, fits, convulsions, or fainting.	☐	☐	Rheumatic fever.
☐	☐	Extensive confinement by illness or injury.	☐	☐	Asthma.
☐	☐	Cardiovascular disease.	☐	☐	Kidney disease.
☐	☐	Tuberculosis.	☐	☐	Muscular disease.
☐	☐	Syphilis.	☐	☐	Suffering from any other disease.
☐	☐	Gonorrhea.	☐	☐	Permanet defect from illness, disease or injury.
☐	☐	Diabetes.	☐	☐	Psychiatric disorder.
☐	☐	Gastrointestinal ulcer.	☐	☐	Any other nervous disorder.

If answer to any of the above is yes, explain: _____

PHYSICAL EXAMINATION

General appearance and development: Good _____ Fair: _____ Poor: _____

Vision: For distance: Right 20/_____ Left 20/_____ ☐ Without corrective lenses ☐ With corrective lenses if worn

Evidence of disease of injury: Right: _____ Left: _____ Color Test: _____

Horizontal field of vision: Right _____ Left _____

Hearing: Right ear _____ Left ear _____ Disease or injury _____

Audiometric Test (complete only if audiometer is used to test hearing) decibel loss at 500 Hz _____,

at 1,000 Hz _____, at 2,000 Hz _____

Throat _____

Thorax: Heart _____ If organic disease is present, is it fully compensated? _____

Blood pressure: Systolic _____ Diastolic _____

Pulse: Before exercise _____ Immediately after exercise _____ Lungs _____

Abdomen: Scars _____ Abnormal masses _____ Tenderness _____

Hernia: Yes _____ No _____ If so, where? _____ Is truss worn? _____

Gastrointestinal: Ulceration or other disease: Yes _____ No _____

Genito-Urinary: Scars _____ Urethral discharge _____

Reflexes: Romberg _____ Pupillary _____ Light R _____ L _____

Accommodation Right _____ Left _____

Knee Jerks: Right: Normal _____ Increased _____ Absent _____

Left: Normal _____ Increased _____ Absent _____

Remarks: _____

Extremities: Upper _____ Lower _____ Spine _____

Laboratory and other Special Findings: Urine: Spec. Gr. _____ Alb. _____ Sugar _____

Other laboratory data (serology, etc) _____

Radiological data _____ Electrocardiograph _____

General comments _____

(Date of examination) (Address of examining doctor) (Name of examining doctor)(Print)

(Signature of examining doctor)

NOTE: This section to be completed only when visual test is conducted by a licensed optometrist.

(Date of examination) (Address of optometrist) (Name of optometrist)(Print)

(Signature of optometrist)

MEDICAL EXAMINER'S CERTIFICATE

I certify that I have examined _____ in accordance with the Federal Motor Carrier Safety Regulations
(Driver's name)(Print)

(49 CFR 391.41-391.49) and with knowledge of his duties, I find him qualified under the regulations.

☐ Qualified only when wearing corrective lenses.
☐ Qualified only when wearing a hearing aid.

A completed examination form for this person is on file in my office at _____
(Address)

(Date of examination) (Name of examining doctor)(Print) (Signature of examining doctor)

(Address of driver) (Signature of driver)

IWL-RW-223 issued: 1/80
revised 8/88

TELEDYNE ISOTOPES

RADIOACTIVE WASTE PROCEDURES EXAMINATION

PART I. Fill in the blanks (each blank worth 2 pts.)

1. List twenty (20) items needed to perform a Radioactive Waste Pickup:

   _____ _____ _____ _____

   _____ _____ _____ _____

   _____ _____ _____ _____

   _____ _____ _____ _____

   _____ _____ _____ _____

2. You should call in advance to a bridge requiring prior notification at least _____ hour(s) prior to arriving at the bridge.

3. Before departing and at the beginning of each day, perform the _____ as detailed in your driver's log book.

4. If no authbrized person is available at the time you arrive at a facility, _____.

5. While inspecting the drum and contents, if the item does not appear to be packaged in accordance with the latest packaging procedures _____ and _____.

6. Swipe approximately _____ cm^2 of each container and hold to the _____ _____ of the GM counter.

7. Label the drum with the mR/hr reading if in excess of _____.

8. The level of radiation (mR/hr) at the outside of the warehouse must not exceed _____.

9. If spillage occurs within a facility, you must first contact the _____ of their facility and then either _____, _____ or _____.

10. In the event of a breakdown, place one red reflective triangle _____ feet behind the vehicle in the center of the lane it occupies. Place another red reflective triangle 100 feet _____ the vehicle in the center of the lane it occupies. Place the third _____ feet _____ the vehicle on the traffic side.

11. You must notify the State of New Jersey whenever transporting more than _____ curies of radioactive material.

12. _____ must be applied to the vehicles during all sole-use shipments.

13. _____ and _____ must be attached to the doors of all shipments to the burial site.

14. All radioactive shipments must be _____ and _____ before being released.

15. There must be three sets of completed paperwork for each shipment. One each for _____, _____ and _____.

TRUE/FALSE (each question 2 pts.)

16. The amount of an isotope allowed in a container can be determined by the isotopes Transport Index and form (special or normal).

17. All "normal" and "special" form packages require security seals when being shipped by a non-exclusive use vehicle.

18. Packages which have Radioactive Yellow II labels on them, must have a security seal.

19. A truck containing 2 drums of Radioactive Yellow II labelled material, with security seals, need not be placarded.

20. During a vehicle breakdown, it's alright to leave the vehicle as long as you leave with a policeman and you lock up the truck.

Test Date: _____

Taken by: _____

Examiner's signature: _____

Answers gone over on: _____

TELEDYNE ISOTOPES

ANSWERS TO R.W.P. EXAM

45 pts. fill ins:

1. See Checklist for Radioactive Waste Pickup form No. IWL-RW-207.
2. One-half
3. Vehicle inspection.
4. Call the office.
5. Refuse acceptance, call the office.
6. 300, end window.
7. 10 mR/hr.
8. 0.5 mR/hr
9. Radiation Safety Officer, our Radiation Safety Officer, Assist. Radiation Safety Officer or Dr. Schutz.
10. 100, in front of, 10, in front of or behind.
11. 20
12. 12 placards
13. Security seals
14. Braced (secured) and surveyed (monitored)
15. Teledyne, T-SMT, NECO.

TRUE/FALSE

16. False- transport group
17. True
18. True
19. True
20. False- do not leave vehicle unattended unless in an extreme emergency.

TELEDYNE ISOTOPES

ANNUAL REVIEW OF DRIVING RECORD

On _____, 19____, I _____

_____ carefully reviewed the driving record

of _____ residing at _____

_____

to determine whether he meets the minimum requirements for safe driving specified in Section 391.11 of Title 49 Code of Federal Regulations or is disqualified to drive a motor vehicle pursuant to Section 391.15.

In reviewing this driver's record, I have considered any evidence that the driver has violated applicable provisions of the Motor Carrier Safety Regulations and the Hazardous Materials Regulations. I also consider the driver's accident record and any evidence that the driver has violated laws governing the operation of motor vehicles, and gave great weight to violations, such as speeding, reckless driving, and operating while under the influence of alcohol or drugs, that indicate that the driver has exibited a disregard for the safety of the public.

_____ _____

Date Signature

TELEDYNE ISOTOPES

STATEMENT OF CERTIFICATION

Teledyne Isotopes has on file in our offices located at 50 Van Buren Avenue, Westwood, New Jersey, certifications from the actual generators in the form of an agreement. By signing the agreement, the generator accepts the liability for properly identifying and packaging the waste and, Teledyne Isotopes accepts the liability for supplying the proper container and properly marking and labeling the container based on the information supplied by the generator.

This statement applies to all packages on shipment number _____.

TELEDYNE ISOTOPES

Steven A. Black, R.S.O.
Manager, Radiological Services Department

TELEDYNE ISOTOPES

RADIOACTIVE MATERIALS PACKAGING AND TRANSPORTATION ACTIVITIES AUDIT CHECKLIST

Laboratory/Department _____ Supervisor _____

License No. _____ License Activity _____

Subcommittee Members _____ Date _____

_____

_____

ITEM	Yes	No	NA
I. DOCUMENTATION			
A. Distribution of procedures to all personnel involved with the safe packaging of Radioactive materials?			
Documented?			
B. Distribution of procedures to all personnel involved with the safe transportation of Radioactive materials?			
Documented?			
C. Review of forms required for departmental use.			
Available?			
D. Distribution list of documents kept by supervisor?			
Updated? When?			
E. Organization shown correctly on organization chart?			
II. TRAINING & SUPERVISION			
A. Does each employee have in his file			
1) "Basic Course in Health Physics (Form IWL-RW-HP-)			
2) "Radioactive Waste Procedures Examination" (Form IWL-RW-224)			
3) "Packaging of Radioactive Waste Examination" (Form IWL-RW-)			
4) Other _____			

TELEDYNE ISOTOPES

REVIEW AND EVALUATION OF RADIOACTIVE MATERIALS ACTIVITIES AUDIT

Laboratory/Department _____ Supervisor _____

License No. _____ License Activity _____

Subcommittee Members _____ Date _____

_____

_____

	Yes	No	NA
I. REVIEW			
A. Documentation Acceptable?			
B. Training Acceptable?			
C. Operating Procedures Acceptable?			
D. Working Conditions Acceptable?			
II. EVALUATION			
A. Review and Audit Acceptable			

B. Problem areas:

1. Define _____

_____

_____

2. Observed by: _____

on: _____

3. Corrective action required _____

_____

By: _____ on: _____

4. Corrective action taken _____

By: _____ on: _____

C. Discussed by Radiation Safety Committee

1. Discussed with _____
2. Discussed on _____
3. Action required _____

_____

TELEDYNE ISOTOPES

Page_____of_____

RADIOACTIVE WASTE
BURIAL CERTIFICATION
FOR THE US ECOLOGY, RICHLAND, WA. SITE

SHIPMENT NO._____ TRAILER NO._____

On the below date, the containers listed below were accepted for burial in accordance with US Ecology's Washington State License No. WN-I019-2.

Date:_____

Accepted By:_____

DRUM ID #	DRUM ID #	DRUM ID #	DRUM ID #	DRUM ID #	DRUM ID #	DRUM ID #	DRUM ID #

IWL-RW-230 issued 11/81

TELEDYNE ISOTOPES

Packaging of Radioactive Waste Examination

I. Fill in the blanks (3 pts. each)

1. List 5 characteristics of the material needed in order to determine the "proper shipping names":

   _____ _____

   _____ _____

   _____

2. List 5 "proper shipping names":

   _____ _____

   _____ _____

   _____

3. The radiation limit at contact with the container cannot exceed _____ mR/hr for a package of LSA material.

4.

Label	mR/hr limits @ contact
Radioactive White I	_____ to _____
Radioactive Yellow II	_____ to _____
Radioactive Yellow III	_____ to _____

5. The marking (label) needed on a package of LSA material (exclusive-use) should read _____.

6. The marking (label) on a package of Radioactive devices should read _____.

7. The weight is required to be printed on a container when it is in excess of _____ lbs., and it is a DOT-7A TYPE A container.

8. List the 6 categories of radioactive waste:

   _____ _____

   _____ _____

   _____ _____

9. Items in different categories _____ be mixed.

10. ALL SVL drums must be lined with a _____.

11. The amount of absorbant added to any SVL drum must be capable of absorbing _____ the volume of liquid in the drum.

12. Liquid Special Nuclear Material has to be _____ before disposal.

II. True or False (1 pt. each)

1. _____ All drums which have a Radioactive I, II or III label require security seals.

2. _____ 400 lbs. is the maximum weight allowed in a 55-gallon container.

3. _____ 11 gallons of liquids are allowed in a DWLVL container.

4. _____ Two 2-mil liners is an acceptable substitute for a 4-mil liner.

5. _____ The pH range for liquids in a DWLVL container is 5.0-10.0.

6. _____ The animal carcass is to be completely surrounded with rock salt and absorbant.

7. _____ Cement is an acceptable solidification media.

8. _____ H-3 gas is acceptable at the Washington burial site under certain conditions.

9. _____ Packaging regulations are under the direct control of the NRC only.

10. _____ The burial site's requirements are of paramount consideration when determining how to package a given material.

TELEDYNE ISOTOPES

USER REQUEST FORM

TO BE FILLED OUT BY INDIVIDUAL

Name _____ Social Security # _____

Birth Date _____ Contact Lenses _____ Yes _____ No

Highest level of education completed _____

Type of Training	Where Trained	Duration of Training	On the Job	Formal Course
a. Principles and practices of radiation protection			Yes No	Yes No
b. Radioactive measurement standardization and monitoring techniques and instruments			Yes No	Yes No
c. Mathematics and calculations basic to the use and measurement of radioactivity			Yes No	Yes No
d. Biological effects o radiation			Yes No	Yes No

EXPERIENCE WITH RADIATION (Actual use of radioisotopes or equivalent experience)

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE

TO BE FILLED OUT BY SUPERVISOR

Radiation work for which authorization is sought: _____

Isotopes: _____ Physical & Chemical Form: _____

Activity: _____ Supervisor Requesting Authorization: _____

Safety Glasses Required: ____Yes ____No Date: _____

TO BE FILLED OUT BY THE SAFETY DEPT.

Health Physics Comments _____

TLD Badge Required: ____Yes ____No Bioassay Required: ____Yes ____No

Type _____ Analysis _____ Frequency _____

Authorization Date _____ By _____
Radiation Safety Officer

COPY DISTRIBUTION

Copies of this form are to be distributed as follows:

_____Health Physics _____Supervisor _____TLD Badge Service

Original form to be returned to Personnel Department

Form IWL-HP-06 (Rev. 4/86)

TELEDYNE ISOTOPES

BASIC HEALTH PHYSICS TRAINING COURSE

Name _____ Length of Course _____

Presented by _____ Test _____

Course Outline

I. Introduction
   - A. Electromagnetic Spectrum
   - B. Ionizing Radiation
     1) Alpha
     2) Beta
     3) Gamma
     4) X-rays

II. History of Uses
   - A. Consumer Reports
   - B. Medical
   - C. Industry

III. Nuclear Constituents, Properties & Production
   - A. Alpha Particles
   - B. Beta Particles
   - C. Fission
   - D. Gamma & X-rays

IV. History of the Atom
   - A. Democritus
   - B. Modern Theory
   - C. Applications for Radiation

V. Radiation Protection
   - A. Monitoring Instrumentation
     1) Film badges
     2) Thermoluminexcent dosimeters
     3) Portable survey meters
     4) Bioassay
   - B. Effects
     1) Chemical change
     2) Biological
     3) High doses
     4) Low doses
     5) Incidence of disease
   - C. Cause & Effect Relationships
   - D. Risk Assessment
   - E. Regulations
     1) ICRP
     2) NCRP
     3) Discussion of Lauristan Taylor
   - F. Organizational Groups
   - G. Prenatal Exposure: Regulatory Guide 8.13

I have received the training outline above, read the Radiation Safety Manual and Regulatory Guide 8.13 "Instruction concerning Prenatal Radiation Exposure", and understand its implications. Any questions I may have had were answered to my satisfaction.

Employee's Signature _____ Date _____

Remarks _____

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ATTACHMENT E

FUNDING DOCUMENTATION

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THE LIPOSOME COMPANY, INC.

STANDBY TRUST AGREEMENT

TRUST AGREEMENT, the Agreement entered into as of July 6, 1994 by and between The Liposome Company, Inc., a Delaware State corporation, herein referred to as the "Grantor," and United Jersey Bank, 210 Main Street, 6th Floor, Hackensack, NJ 07601, the "Trustee."

WHEREAS, the U.S. Nuclear Regulatory Commission (NRC), an agency of the U.S. Government, pursuant to the Atomic Energy Act of 1954, as amended, and the Energy Reorganization Act of 1974, has promulgated regulations in Title 10, Chapter I of the Code of Federal Regulations, Part 30. These regulations, applicable to the Grantor, require that a holder of, or an applicant for, a Part 30, 40, 70, or 72 license provide assurance that funds will be available when needed for required decommissioning activities.

WHEREAS, the Grantor has elected to use a letter of credit, to provide all of such financial assurance for the facilities identified herein; and

WHEREAS, when payment is made under a letter of credit, this standby trust shall be used for the receipt of such payment; and

WHEREAS, the Grantor, acting through its duly authorized officers, has selected the Trustee to be the trustee under this Agreement, and the Trustee is willing to act as trustee,

NOW, THEREFORE, the Grantor and the Trustee agree as follows:

Section 1. Definitions. As used in this Agreement:

(a) The term "Grantor" means the NRC licensee who enters into this Agreement and any successors or assigns of the Grantor.

(b) The term "Trustee" means the trustee who enters into this Agreement and any successor Trustee.

Section 2. Costs of Decommissioning. This Agreement pertains to the costs of decommissioning the materials and activities identified in License Number 29-19918-01 issued pursuant to 10 CFR Part 30 as shown in Schedule A.

Section 3. Establishment of Fund. The Grantor and the Trustee hereby establish a standby trust fund (the Fund) for the benefit of the NRC. The Grantor and the Trustee intend that no third party have access to the Fund except as provided herein.

Section 4. Payments Constituting the Fund. Payments made to the Trustee for the Fund shall consist of cash, securities, or other liquid assets acceptable to the Trustee. The Fund is established initially as consisting of the property, which is acceptable to the Trustee, described in Schedule B attached hereto. Such property and any other property subsequently transferred to the Trustee are referred to as the "Fund," together with all earnings and profits thereon, less any payments or distributions made by the Trustee pursuant to this Agreement. The Fund shall be held by the Trustee, IN TRUST, as hereinafter provided.

The Trustee shall not be responsible nor shall it undertake any responsibility for the amount of, or adequacy of the Fund, nor any duty to collect from the Grantor, any payments necessary to discharge any liabilities of the Grantor established by the NRC.

Section 5. Payment for Required Activities Specified in the Plan. The Trustee shall make payments from the Fund to the Grantor upon presentation to the Trustee of the following:

a. A certificate duly executed by the Secretary of the Depositor attesting to the occurrence of the events, and in the form set forth in the attached Specimen Certificate, and

b. A certificate attesting to the following conditions;

(1) that decommissioning is proceeding pursuant to an NRC-approved plan.

(2) that the funds withdrawn will be expended for activities undertaken pursuant to that Plan, and

(3) that the NRC has been given 30 days' prior notice of The Liposome Company's intent to withdraw funds from the escrow fund.

No withdrawal from the fund can exceed 10 percent of the outstanding balance of the Fund or 12,000 dollars, whichever is greater, unless NRC approval is attached.

In the event of the Grantor's default or inability to direct decommissioning activities, the Trustee shall make payments from the Fund as the NRC shall direct, in writing, to provide for the payment of the costs of required activities covered by this Agreement. The Trustee shall reimburse the Grantor or other persons as specified by the NRC, or State agency, from the Fund for expenditures for required activities in such amounts as the NRC, or State agency, shall direct in writing. In addition, the Trustee shall refund to the Grantor such amounts as the NRC specifies in writing. Upon refund, such funds shall no longer constitute part of the Fund as defined herein.

Section 6. Trust Management. The Trustee shall invest and reinvest the principal and income of the Fund and keep the Fund invested as a single fund, without distinction between principal and income, in accordance with general investment policies and guidelines which the Grantor may communicate in writing to the Trustee from time to time, subject, however, to the provisions of this section. In investing, reinvesting, exchanging, selling, and managing the Fund, the Trustee shall discharge its duties with respect to the Fund solely in the interest of the beneficiary and with the care, skill, prudence, and diligence under the circumstances then prevailing which persons of prudence, acting in a like capacity and familiar with such matters, would use in the conduct of an enterprise of a like character and with like aims; except that:

(a) Securities or other obligations of the Grantor, or any other owner or operator of the facilities, or any of their affiliates as defined in the Investment Company Act of 1940, as amended (15 U.S.C. 80a-2(a)), shall not be acquired or held, unless they are securities or other obligations of the Federal or a State government;

(b) The Trustee is authorized to invest the Fund in time or demand deposits of the Trustee, to the extent insured by an agency of the Federal Government, and in obligations of the Federal Government such as GNMA, FNMA, and FHLM bonds and certificates or State and Municipal bonds rated BBB or

higher by Standard and Poors or Baa or higher by Moody's Investment Services; and

(c) For a reasonable time, not to exceed 60 days, the Trustee is authorized to hold uninvested cash, awaiting investment or distribution, without liability for the payment of interest thereon.

Section 7. Commingling and Investment. The Trustee is expressly authorized in its discretion:

a) To transfer from time to time any or all of the assets of the fund to any common, commingled, or collective trust fund created by the Trustee in which the Fund is eligible to participate, subject to all of the provisions thereof, to be commingled with the assets of other trusts participating therein; and

(b) To purchase shares in any investment company registered under the Investment Company Act of 1940 (15 U.S.C. 80a-1 et seq.), including one that may be created, managed, underwritten, or to which investment advice is rendered, or the shares of which are sold by the Trustee. The Trustee may vote such shares in its discretion.

Section 8. Express Powers of Trustee. Without in any way limiting the powers and discretion conferred upon the Trustee by the other provisions of this Agreement or by law, the Trustee is expressly authorized and empowered:

(a) To sell, exchange, convey, transfer, or otherwise dispose of any property held by it, by public or private sale, as necessary to allow duly authorized withdrawals at the joint request of the Grantor and the NRC or to reinvest in securities at the direction of the Grantor;

(b) To make, execute, acknowledge, and deliver any and all documents of transfer and conveyance and any and all other instruments that may be necessary or appropriate to carry out the powers herein granted;

(c) To register any securities held in the Fund in its own name, or in the name of a nominee, and to hold any security in bearer form or in book entry, or to combine certificates representing such securities with certificates of the same issue held by the Trustee in other fiduciary capacities, to reinvest interest payments and funds from matured and redeemed instruments, to file proper forms concerning securities held in the Fund in a timely fashion with appropriate government agencies, or to deposit or arrange for the deposit of such securities in a qualified central depository even though, when so deposited, such securities may be merged and held in bulk in the name of the nominee or such depository with other securities deposited therein by another person, or to deposit or arrange for the deposit of any securities issued by the U.S. Government, or any agency or instrumentality thereof, with a Federal Reserve bank, but the books and records of the Trustee shall at all times show that all such securities are part of the Fund;

(d) To deposit any cash in the Fund in interest-bearing accounts maintained or savings certificates issued by the Trustee, in its separate corporate capacity, or in any other banking institution affiliated with the Trustee, to the extent insured by an agency of the Federal government; and

(e) To compromise or otherwise adjust all claims in favor of or against the Fund.

Section 9. Taxes and Expenses. All taxes of any kind that may be assessed or levied against or in respect of the Fund and all brokerage commissions incurred by the Fund shall be paid from the Fund. All other expenses incurred by the Trustee in connection with the administration of this Trust, including fees for

legal services rendered to the Trustee, the compensation of the Trustee to the extent not paid directly by the Grantor, and all other proper charges and disbursements of the Trustee shall be paid from the Fund.

Section 10. Annual Valuation. After payment has been made into this standby trust fund, the Trustee shall annually, at least 30 days before the anniversary date of receipt of payment into the standby trust fund, furnish to the Grantor and to the NRC a statement confirming the value of the Trust. Any securities in the Fund shall be valued at market value as of no more than 60 days before the anniversary date of the establishment of the Fund. The failure of the Grantor to object in writing to the Trustee within 90 days after the statement has been furnished to the Grantor and the NRC, or State agency, shall constitute a conclusively binding assent by the Grantor, barring the grantor from asserting any claim or liability against the Trustee with respect to the matters disclosed in the statement.

Section 11. Advice of Counsel. The Trustee may from time to time consult with counsel with respect to any question arising as to the construction of this Agreement or any action to be taken hereunder. The Trustee shall be fully protected, to the extent permitted by law, in acting on the advice of counsel.

Section 12. Trustee Compensation. The Trustee shall be entitled to reasonable compensation for its services as agreed upon in writing with the Grantor. (See Schedule C.)

Section 13. Successor Trustee. Upon 90 days notice to the NRC, the Trustee may resign; upon 90 days notice to NRC and the Trustee, the Grantor may replace the Trustee; but such resignation or replacement shall not be effective until the Grantor has appointed a successor Trustee and this successor accepts the appointment. The successor Trustee shall have the same powers and duties as those conferred upon the Trustee hereunder. Upon the successor Trustee's acceptance of the appointment, the Trustee shall assign, transfer, and pay over to the successor Trustee the funds and properties then constituting the Fund. If for any reason the Grantor cannot or does not act in the event of the resignation of the Trustee, the Trustee may apply to a court of competent jurisdiction for the appointment of a successor Trustee or for instructions. The successor Trustee shall specify the date on which it assumes administration of the trust in a writing sent to the Grantor, the NRC or State agency, and the present Trustee by certified mail 10 days before such change becomes effective. Any expenses incurred by the Trustee as a result of any of the acts contemplated by this section shall be paid as provided in Section 9.

Section 14. Instructions to the Trustee. All orders, requests, and instructions by the Grantor to the Trustee shall be in writing, signed by such persons as are signatories to this agreement or such other designees as the Grantor may designate in writing. The Trustee shall be fully protected in acting without inquiry in accordance with the grantor's orders, requests, and instructions. If the NRC or State agency issues orders, requests, or instructions to the Trustee these shall be in writing, signed by the NRC, or State agency, or their designees, and the Trustee shall act and shall be fully protected in acting in accordance with such orders, requests, and instructions. The Trustee shall have the right to assume, in the absence of written notice to the contrary, that no event constituting a change or a termination of the authority of any person to act on behalf of the Grantor, the NRC, or State agency, hereunder has occurred. The Trustee shall have no duty to act in the absence of such orders, requests, and instruction from the Grantor and/or the NRC, or State agency, except as provided for herein.

Section 15. Amendment of Agreement. This Agreement may be amended by an instrument in writing executed by the Grantor, the Trustee and the NRC, or State agency, or by the Trustee and the NRC or State Agency, if the Grantor ceases to exist.

Section 16. Irrevocability and Termination. Subject to the right of the parties to amend this agreement as provided in Section 15, this trust shall be irrevocable and shall continue until terminated at the written agreement of the Grantor, the Trustee, and the NRC or State agency, or by the Trustee and the NRC or State agency, if the Grantor ceases to exist. Upon termination of the trust, all remaining trust property, less final trust administration expenses shall be delivered to the Grantor or its successor.

Section 17. Immunity and Indemnification. The Trustee shall not incur personal liability of any nature in connection with any act or omission, made in good faith, in the administration of this trust, or in carrying out any directions by the Grantor, the NRC, or State agency, issued in accordance with this Agreement. The Trustee shall be indemnified and saved harmless by the Grantor or from the trust fund, or both, from and against any personal liability to which the Trustee may be subjected by reason of any act or conduct in its official capacity, including all expenses reasonably incurred in its defense in the event the Grantor fails to provide such defense.

Section 18. This Agreement shall be administered, construed, and enforced according to the laws of the State of New Jersey.

Section 19. Interpretation and Severability. As used in this Agreement, words in the singular include the plural and words in the plural include the singular. The descriptive headings for each section of this Agreement shall not affect the interpretation or the legal efficacy of this Agreement. If any part of this agreement is invalid, it shall not affect the remaining provisions which will remain valid and enforceable.

IN WITNESS WHEREOF the parties have caused this Agreement to be executed by the respective officers duly authorized and the incorporate seals to be hereunto affixed and attested as of the date first written above.

ATTEST:

Kenneth B. Mahr

Secretary (Assistant)

[Title]
[Seal]

The Liposome Company, Inc.

Brooks Boveroux
Vice President and Chief Financial Officer

ATTEST

Debra Schwalb

DEBRA SCHWALB
ASSISTANT SECRETARY

[Title]
[Seal]

United Jersey Bank

Jeffery W Martin
Vice President and Sales Manager

Specimen Certificate of Events

United Jersey Bank

Attn: Trust Division

Gentlemen:

In accordance with the terms of the Standby Trust Agreement (the "Agreement") with you dated _____, 19__, I _____ Secretary (Assistant) of The Liposome Company, Inc., hereby certify that the following events have occurred:

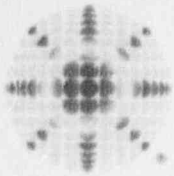
1. The Liposome Company, Inc. is required to commence the decommissioning of its facility at One Research Way, Princeton Forrestal Center, Princeton, NJ (the "Decommissioning");

2. The plans and procedures for the commencement and conduct of the Decommissioning have been approved by the United States Nuclear Regulatory Commission, or its successor agency, on _____, 19__ (a copy of the approval notification is attached hereto);

3. The Board of Directors of The Liposome Company, Inc. has adopted a resolution, substantially in the form of the resolution attached hereto, authorizing commencement of the Decommissioning.

_____
Secretary (Assistant)
The Liposome Company, Inc.

_____
Date



Certificate of Resolution

I, _____. do hereby certify, that I am Secretary (Assistant) of The Liposome Company, Inc., (the "Company"), a corporation of the State of Delaware, and that the resolution listed below was duly adopted at a meeting of this Corporation's Board of Directors on _____, 19___.

IN WITNESS THEREOF, I have hereuto signed my name and affixed the seal of this Corporation this day of _____, 19___.

_____

Secretary (Assistant)
The Liposome Company, Inc.

RESOLVED, that the Board of Directors hereby authorizes the Chief Executive Officer, or such other employee of the Company as he may designate, to commence decommissioning activities at the faility of The Liposome Company, Inc., located at One Research Way, Princeton Forrestal Center, Princeton, NJ, in accordance with the terms and conditions described to this Board of Directors at this meeting, and with such other terms and conditions as the Chief Executive Officer shall approve with, and upon, the advice and consent of Counsel.

Trust Agreement Schedules

SCHEDULE A

This Agreement demonstrates financial assurance for the following cost estimates for the following licensed activities:

Research and Development as defined in 10 CFR 30.4; Animal Studies.

LICENSE No. 29-19918-01
The Liposome Company, Inc., 1 Research Way, Princeton, NJ 08540
Cost Estimate for Decommissioning - $119,981.00

The cost estimates listed here were last adjusted and approved by the NRC on _____.

SCHEDULE B

Amount $119,981.00

As Evidenced By: P-232687
(Letter of Credit No.)

lb
7-6-94
nrcltr

ACKNOWLEDGEMENT

STATE OF NEW JERSEY

COUNTY OF BERGEN

CITY OF HACKENSACK

On this 13th day of July, before me, a Notary Public in and for the City and State aforesaid, personally appeared Jeffrey W. Martin, and he did depose and say that he is the Vice President of United Jersey Bank, State Banking Association, Trustee, which executed the above instrument, that he knows the seal of said Association; that the seal affixed to such instrument is such corporate seal; that it was so affixed by order of the Association; and that he signed his name thereto by like order.

Malina F. Newman
Signature of Notary Public

MALINA F. NEWMAN
NOTARY PUBLIC OF NEW JERSEY
My Commission Expires Oct. 16, 1994

My Commission Expires: _____
Date

CHEMICAL Chemical Bank
International Division
270 Madison Ave
Morristown NJ 07960

ISSUE DATE JULY 15 1994
L/C NO. P-232687

Advising Bank
DIRECT

APPLICANT
THE LIPOSOME COMPANY INC.
ONE REARCH WAY
PRINCETON, N.J. 08540

MAIL TO

Beneficiary
U.S. NUCLEAR REGULATORY COMMISSION
REGION 1 475 ALLENDALE ROAD
KING OF PRUSSIA, PA 19406-1415

AMOUNT USD 119,981.00
ONE HUNDRED NINETEEN THOUSAND
NINE HUNDRED EIGHTY ONE
AND 00/100 UNITED STATES
DOLLARS

WE HEREBY ESTABLISH OUR IRREVOCABLE STANDBY LETTER OF CREDIT NO. P-232687 IN YOUR FAVOR, AT THE REQUEST AND FOR THE ACCOUNT OF THE LIPOSOME COMPANY, 1 RESEARCH WAY, PRINCETON, NJ 08540 UP TO THE AGGREGATE AMOUNT OF ONE HUNDRED AND NINETEEN THOUSAND NINE HUNDRED AND EIGHTY ONE U.S. DOLLARS $119,981.00. AVAILABLE UPON PRESENTATION OF THE FOLLOWING:

1 - A SIGHT DRAFT, BEARING REFERENCE TO THIS LETTER OF CREDIT NO. P-232687.

2 - BENEFICIARY'S DATED STATEMENT PURPORTEDLY SIGNED BY ONE OF ITS OFFICIALS READING "I CERTIFY THAT THE AMOUNT OF THE DRAFT IS PAYABLE PURSUANT TO REGULATIONS ISSUED UNDER AUTHORITY OF 10 CFR PART 30."

THIS LETTER OF CREDIT IS ISSUED IN ACCORDANCE WITH REGULATIONS ISSUED UNDER THE AUTHORITY OF THE U.S. NUCLEAR REGULATORY COMMISSION (NRC), AN AGENCY OF THE U.S. GOVERNMENT, PURSUANT TO THE ATOMIC ENERGY ACT OF 1954, AS AMENDED, AND THE ENERGY REORGANIZATION ACT OF 1974. THE NRC HAS PROMULGATED REGULATIONS IN TITLE 10, CHAPTER 1 OF THE CODE OF FEDERAL REGULATIONS, PART 30, WHICH REQUIRE THAT A HOLDER OF, OR APPLICANT FOR, A LICENSE ISSUED UNDER 10 CFR PART 30 PROVIDE ASSURANCE THAT FUNDS WILL BE AVAILABLE WHEN NEEDED FOR DECOMMISSIONING.

THIS LETTER OF CREDIT IS EFFECTIVE IMMEDIATELY AND SHALL EXPIRE ON JULY 15, 1995, BUT SUCH EXPIRATION DATE SHALL BE AUTOMATICALLY EXTENDED FOR A PERIOD OF AT LEAST ONE YEAR ..... AND ON EACH SUCCESSIVE EXPIRATION DATE, UNLESS, AT LEAST 90 DAYS BEFORE THE CURRENT EXPIRATION DATE, WE NOTIFY YOU AND THE LIPOSOME COMPANY, BY CERTIFIED MAIL, AS SHOWN ON THE SIGNED RETURN RECEIPTS, IF THE LIPOSOME COMPANY IS UNABLE TO SECURE ALTERNATIVE FINANCIAL ASSURANCE TO REPLACE THIS LETTER OF CREDIT WITHIN 30 DAYS OF NOTIFICATION OF CANCELLATION THE NRC MAY DRAW UPON THE FULL VALUE OF THIS LETTER OF CREDIT PRIOR TO CANCELLATION. THE BANK SHALL GIVE IMMEDIATE NOTICE TO

-CONTINUED-

Copy of Letter of Credit

ORIGINAL MAILED DIRECT

P-232687 001-C1-01-02-01

Daniel J. Klaiski S.V.P.
Chemical Bank New Jersey

Provisions applicable to this credit:
This credit is subject to the Uniform Customs and Practice for Documentary Credits (1993 Revision) International Chamber of Commerce Publication No. 500

CHEMICAL 01:54PM CHEMICAL STANDBY L/C P.2/3

Chemical Bank
International Division
270 Park Avenue, New York, NY 10017
One Chase Manhattan Plaza, New York, NY 10081
Chemical Bank New Jersey, N.A.
333 Madison Avenue
Morristown, NJ 07960

ISSUE DATE JULY 15, 1994
L/C NO. P-232687

Advising Bank

DIRECT

APPLICANT:
THE LIPOSOME COMPANY INC.
ONE REARCH WAY
PRINCETON, N.J. 08540

MAIL TO

Beneficiary:

U.S. NUCLEAR REGULATORY COMMISSION
REGION 1 - 475 ALLENDALE ROAD
KING OF PRUSSIA, PA 19406-1415

AMOUNT USD 119,981.00
(ONE HUNDRED NINETEEN THOUSAND
NINE HUNDRED EIGHTY ONE
AND 00/100 UNITED STATES
DOLLARS)

THE APPLICANT AND THE NRC OF ANY NOTICE RECEIVED OR ACTION FILED ALLEGING (1) THE INSOLVENCY OR BANKRUPTCY OF THE FINANCIAL INSTITUTION OR (2) ANY VIOLATIONS OF REGULATORY REQUIREMENTS THAT COULD RESULT IN THE SUSPENSION OR REVOCATION OF THE BANK'S CHARTER OR LICENSE TO DO BUSINESS. THE FINANCIAL INSTITUTION ALSO SHALL GIVE IMMEDIATE NOTICE IF THE BANK, FOR ANY REASON, BECOMES UNABLE TO FULFILL ITS OBLIGATION UNDER THE LETTER OF CREDIT.

WHENEVER THIS LETTER OF CREDIT IS DRAWN ON UNDER AND IN COMPLIANCE WITH THE TERMS OF THIS LETTER OF CREDIT, WE SHALL DULY HONOR SUCH DRAFT UPON ITS PRESENTATION TO US WITHIN 30 DAYS AND WE SHALL DEPOSIT THE AMOUNT OF THE DRAFT DIRECTLY INTO THE STANDBY TRUST FUND OF THE LIPOSOME COMPANY IN ACCORDANCE WITH YOUR INSTRUCTIONS.

EACH DRAFT MUST BEAR ON ITS FACE THE CLAUSE: "DRAWN UNDER LETTER OF CREDIT NO. P-232687 DATED JULY 15, 1994," AND THE TOTAL OF THIS DRAFT AND ALL OTHER DRAFTS PREVIOUSLY DRAWN UNDER THIS LETTER OF CREDIT DOES NOT EXCEED $119,981.00.

THIS CREDIT IS SUBJECT TO THE UNIFORM CUSTOMS AND PRACTICE FOR DOCUMENTARY CREDITS, 1993 REVISION, ICC PUBLICATION NO. 500.

THE PRE-PRINTED WORDING APPEARING ON THIS ADVICE REFERENCING ICC PUBLICATION NO. 400 IS HEREBY DELETED.

Daniel A. Walsh, S.V.P.
Chemical Bank New Jersey

P-232687-001-C1-01-02-01

Provisions applicable to this credit:
This credit is subject to the Uniform Customs and Practice for Documentary Credits (1983 Revision), International Chamber of Commerce Publication No. 400

ATTACHMENT F

COST ESTIMATE

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Attachment F

Decommissioning Cost Estimate

TABLE 1 Labor Estimates	Facility Name: Facility Address: NRC License No.:	The Liposome Company 1 Research Way, Princeton, NJ 29-19918-01

Activities	Work Hours Manager or R.S.O.	H.P. Supv.	H.P. Tech.	R.W. Tech.	Clerical	Total Hrs.	Total Cost
#1: Final Update of Decom. Plan	32	8	8	8	8	64	$5,488
#3: Characterization oi Radiological Condition of the Facility	8	24	24		4	60	$5,092
#2, 5: *See Below	-	-	-	-	-	-	-
#4: Decontamination, dismantling, demolition and/or packaging of contaminated objects & wastes from decontamination activities	4	16	16	8		44	$3,792
#6: Final survey	8	8	8	8	8	40	$3,088
LABOR TOTALS	52	56	56	24	20	208	**$17,460**

*Labor rates for disposal operations are included in the disposal costs. See Table 5 for estimated disposal costs.

Decommissioning Cost Estimate

TABLE 2	Facility Name:	The Liposome Company
Salary Rates Used in Table 1	NRC License No.:	29-19918-01

Worker Classification:	Worker Cost/Hour
Manager	$100.00
H.P. Supv.	$95.00
H.P. Tech.	$78.00
R.W. Tech.	$78.00
Clerical	$35.00

Decommissioning Cost Estimate

Table 3	Facility Name:	The Liposome Company
DECONTAMINATION and/or DISMANTLING of RADIOACTIVE FACILITY COMPONENTS	NRC License No.:	29-19918-01

Assumptions for this facility:

	Disposal	Decon
% Class A	98.0%	100.0%
% Class B	0.0%	0.0%
% Class C	2.0%	0.0%
% Contaminated Walls	10.0%	90.0%
% Contaminated Floors	10.0%	90.0%
% Contaminated Ductwork	100.0%	0.0%
% Contaminated Sinks & Drains	100.0%	0.0%
% Contaminated Hoods	50.0%	50.0%

We have assumed that from general contamination the equivalent of one-half of one laboratory, other than the individual areas identified below, will require decontamination and/or dismantling. All volumes in tables are stated as cubic feet.

Only areas where there is expected contamination are listed below. The following pages each describe one of the below areas:

- Waste Room
- Instrument Hall
- Main Lab B
- Main Lab C
- Equivalent of 1/2 of one laboratory

Decommissioning Cost Estimate

Table 3	Facility Name:	The Liposome Company
DECONTAMINATION and/or DISMANTLING of RADIOACTIVE FACILITY COMPONENTS	NRC License No.:	29-19918-01
	Room or Area:	Waste Room

Assumptions for this area:

10CFR61 Waste Class:	Disposal	Decon
% Class A	100.0%	100.0%
% Class B	0.0%	0.0%
% Class C	0.0%	0.0%
Disposal vs. Decon Estimates:		
% Contaminated Walls	0.0%	0.0%
% Contaminated Floors	0.0%	0.0%
% Contaminated Ductwork	0.0%	0.0%
% Contaminated Sinks & Drains	0.0%	0.0%
% Contaminated Hoods	0.0%	0.0%
% Contaminated Equip. (See Below)	20.0%	80.0%

Volume Estimates (cubic feet):

		10CFR Part 61 Waste Class		
Item:	Quantity	Class A	Class B	Class C
Fume Hoods	0.0	0.0	0.0	0.0
Lab Benches	20.0	0.0	0.0	0.0
Sink and Drains	0.0	0.0	0.0	0.0
Amount of Floor Space (150 sq. ft.)	40.0	0.0	0.0	0.0
Ventilation Ductwork (0)	0.0	0.0	0.0	0.0
Amount of Wall Space (120 sq. ft.)	40.0	0.0	0.0	0.0
On-site waste	22.5	22.5	0.0	0.0
VOLUME TOTALS:	122.5	22.5	0.0	0.0

Note: Quantity is the total volume under consideration.

Decommissioning Cost Estimate

Table 3	Facility Address:	1 Research Way, Princeton, NJ
DECONTAMINATION and/or DISMANTLING of RADIOACTIVE FACILITY COMPONENTS	Room or Area:	Instrument Hall

Assumptions for this area:

10CFR61 Waste Class:	Disposal	Decon
% Class A	100.0%	100.0%
% Class B	0.0%	0.0%
% Class C	0.0%	0.0%
Disposal vs. Decon Estimates:		
% Contaminated Walls	0.0%	0.0%
% Contaminated Floors	0.0%	0.0%
% Contaminated Ductwork	0.0%	0.0%
% Contaminated Sinks & Drains	0.0%	0.0%
% Contaminated Hoods	0.0%	0.0%
% Contaminated Equip. (See Below)	10.0%	90.0%

Volume Estimates (cubic feet):

		10CFR Part 61 Waste Class		
Item:	Quantity	Class A	Class B	Class C
Glove Boxes	0.0	0.0	0.0	0.0
Lab Benches	0.0	0.0	0.0	0.0
Sink and Drains	0.0	0.0	0.0	0.0
Amount of Floor Space (160 sq. ft.)	40.0	0.0	0.0	0.0
Ventillation Ductwork (0 linear ft.)	0.0	0.0	0.0	0.0
Amount of Wall Space (64 sq. ft.)	16.0	0.0	0.0	0.0
Other:				
Liquid Scintillation Counter	48.0	5.0		
Gamma Counter	48.0	0.0		
2 x refrigerators	60.0	7.0		
2 x Centrifuge	54.0	7.0		
Vacuum Oven	8.0	0.0		
VOLUME TOTALS:	274.0	19.0	0.0	0.0

Note: Quantity is the total volume under consideration.

Note: The LSC and centrifuges are expected to be contaminated.

Decommissioning Cost Estimate

Table 3	Facility Address:	1 Research Way, Princeton, NJ
DECONTAMINATION and/or DISMANTLING of RADIOACTIVE FACILITY COMPONENTS	Room or Area:	Main Lab B

Assumptions for this area:

10CFR61 Waste Class:	Disposal	Decon
% Class A	100.0%	100.0%
% Class B	0.0%	0.0%
% Class C	0.0%	0.0%
Disposal vs. Decon Estimates:		
% Contaminated Walls	0.0%	0.0%
% Contaminated Floors	0.0%	0.0%
% Contaminated Ductwork	0.0%	0.0%
% Contaminated Sinks & Drains	10.0%	0.0%
% Contaminated Hoods	0.0%	0.0%
% Contaminated Equip. (See Below)	0.0%	0.0%

Volume Estimates (cubic feet):

Item:	Quantity	10CFR Part 61 Waste Class: Class A	Class B	Class C
Glove Boxes	0.0	0.0	0.0	0.0
Fume Hoods	24.0	0.0	0.0	0.0
Hot Cells	0.0	0.0	0.0	0.0
Lab Benches	300.0	0.0	0.0	0.0
Sink and Drains	10.0	5.0	0.0	0.0
Amount of Floor Space (1280 sq. ft.)	320.0	0.0	0.0	0.0
Ventillation Ductwork (40 linear ft.)	0.0	0.0	0.0	0.0
Amount of Wall Space (600 sq. ft.)	150.0	0.0	0.0	0.0
VOLUME TOTALS:	804.0	5.0	0.0	0.0

Note: Quanity is the total volume under consideration.

Note: Some of the sinks are expected to be contaminated.

Decommissioning Cost Estimate

Table 3	Facility Address:	1 Research Way, Princeton, NJ
DECONTAMINATION and/or DISMANTLING of RADIOACTIVE FACILITY COMPONENTS	Room or Area:	Main Lab C

Assumptions for this area:

10CFR61 Waste Class:	Disposal	Decon
% Class A	100.0%	100.0%
% Class B	0.0%	0.0%
% Class C	0.0%	0.0%
Disposal vs. Decon Estimates:		
% Contaminated Walls	0.0%	0.0%
% Contaminated Floors	0.0%	0.0%
% Contaminated Ductwork	0.0%	0.0%
% Contaminated Sinks & Drains	10.0%	90.0%
% Contaminated Hoods	0.0%	0.0%
% Contaminated Equip. (See Below)	10.0%	90.0%

Volume Estimates (cubic feet):

		10CFR Part 61 Waste Class		
Item:	Quantity	Class A	Class B	Class C
Glove Boxes	0.0	0.0	0.0	0.0
Lab Benches	250.0	0.0	0.0	0.0
Sink and Drains	3.0	1.0	0.0	0.0
Amount of Floor Space (1600 sq. ft.)	400.0	0.0	0.0	0.0
Ventillation Ductwork (40 linear ft.)	40.0	0.0	0.0	0.0
Amount of Wall Space (360 sq. ft.)	90.0	0.0	0.0	0.0
Other:				
3 x Centrifuges	81.0	10.0	0.0	0.0
3 x Refrigerators	90.0	14.0	0.0	0.0
2 x Laboratory Balance	4.0	2.0	0.0	0.0
VOLUME TOTALS:	958.0	27.0	0.0	0.0

Note: Quantity is the total volume under consideration.

Note: These items are expected to be slightly contaminated.

Decommissioning Cost Estimate

Table 3	Facility Name:	The Liposome Company
DECONTAMINATION and/or DISMANTLING of RADIOACTIVE FACILITY COMPONENTS	NRC License No.:	29-19918-01
	Room or Area:	Equivalent of 1/2 of One (1) Standard Lab

Assumptions for this area:

10CFR61 Waste Class:	Disposal	Decon
% Class A	100.0%	100.0%
% Class B	0.0%	0.0%
% Class C	0.0%	0.0%
Disposal vs. Decon Estimates:		
% Contaminated Walls	50.0%	50.0%
% Contaminated Floors	100.0%	0.0%
% Contaminated Ductwork	100.0%	0.0%
% Contaminated Sinks & Drains	100.0%	0.0%
% Contaminated Hoods	50.0%	50.0%
% Contaminated Equip. (See Below)	100.0%	0.0%

Volume Estimates (cubic feet):

Item:	Quantity	10CFR Part 61 Waste Class: Class A	Class B	Class C
Fume Hoods	96.0	48.0	0.0	0.0
Lab Benches	25.0	25.0	0.0	0.0
Sink and Drains	15.0	15.0	0.0	0.0
Amount of Floor Space	15.0	15.0	0.0	0.0
Ventilation Ductwork	15.0	15.0	0.0	0.0
Amount of Wall Space	15.0	7.5	0.0	0.0
Other:				
Misc. Equipment- see list on right	78.0	54.0		
VOLUME TOTALS:	259.0	179.5	0.0	0.0

Note: Quantity is the total volume under consideration.

The following equipment was considered:

1- fume hood 72"x28"x62"
2- sinks
2- refrigerators
2- benches 30"x20'
1- bench 60"x20'
1- 2x2x1 HEPA filter

TABLE 4			Facility Name:	The Liposome Company
Equipment Costs			NRC License No.:	29-19918-01

	Rental per day	Days	Rental Total	Purchase Total
Equipment/Supply:				
Health Physics Monitoring Equipment	$125.00	5	$625.00	
Miscellaneous Equipment Purchases	$2,000.00			$2,000.00

Decommissioning Cost Estimate

TABLE 3			Facility Name:		The Liposome Company
Rad. Waste Disposal Costs			NRC License No.:		29-19918-01
Container Type	Type	Vol.(ft3)	Quantity*	Unit Cost	Total Cost
55 gallon steel drums	A	N/A	253.00	$300.00	$75,900
55 gallon steel drums	B	0.00	0	$8,000.00	$0
55 gallon steel drums	C	7.50	0	$8,000.00	$0
					$75,900

*Quantity is in cubic feet for Class A waste and No. of drums for Class B & C.

Unit costs assume that the Class A waste will be super-compacted.

Decommissioning Cost Estimate

TABLE 6		Facility Name:	The Liposome Company
Summary of Costs		NRC License No.:	29-19918-01

Total Labor Costs (from Table 1)		$17,460
Total Equipment Costs (from Table 4)		$2,625
Total Radwaste Disposal Costs (from Table 5)		$75,900
ESTIMATED TOTAL:		$95,985
Contingency Factor:	25%	$23,996
DFP TOTAL:		$119,981

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ATTACHMENT G

INDIVIDUAL ROOM / AREA DIAGRAMS

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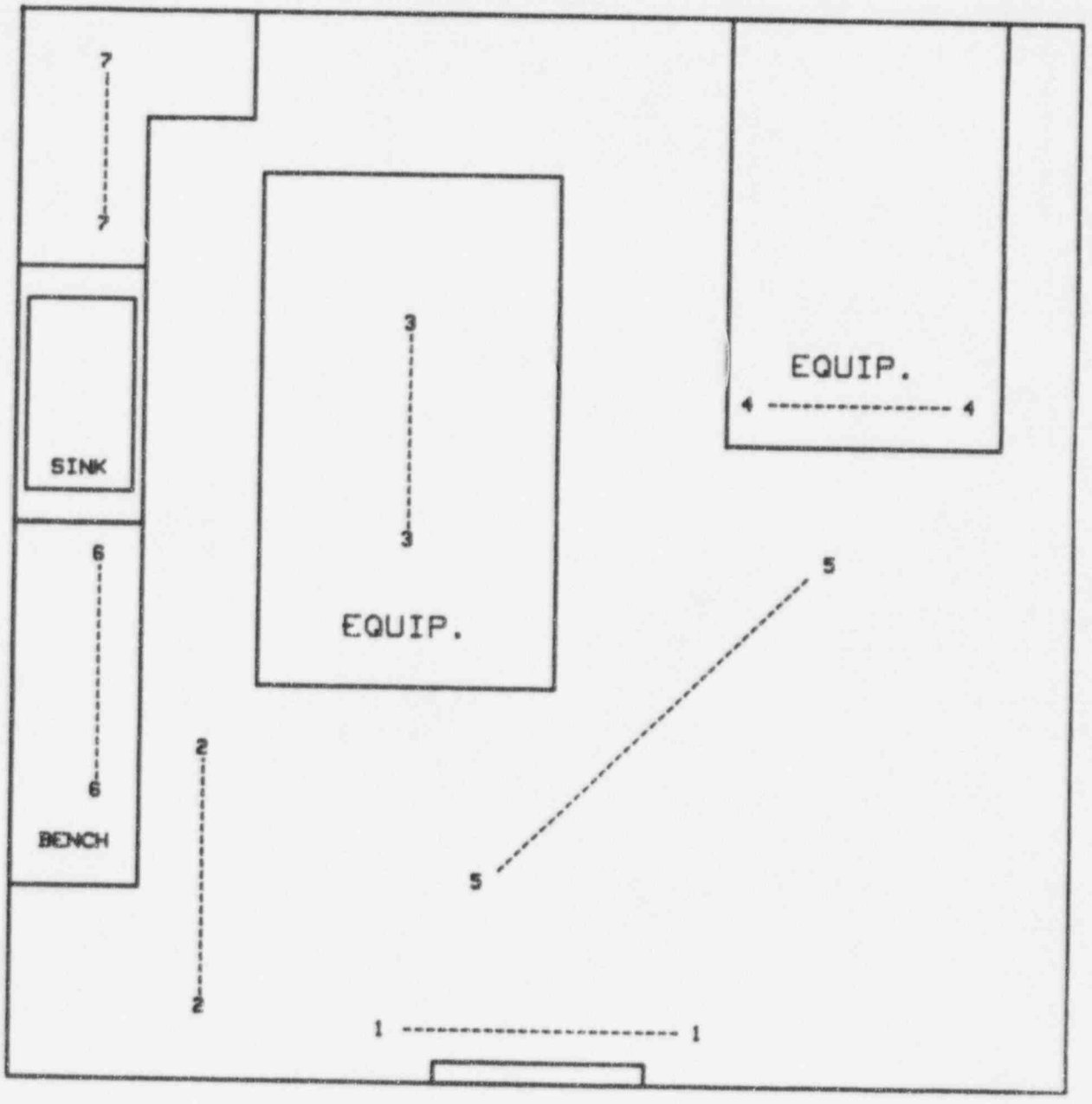
TELEDYNE ISOTOPES

DIAGRAM OF SURVEYED AREA

LOCATION: ANIMAL PREP ROOM

PRINCIPLE OCCUPANTS: KENCH, K.

ISOTOPE USAGE: H-3, Fe-59, C-14, I-125



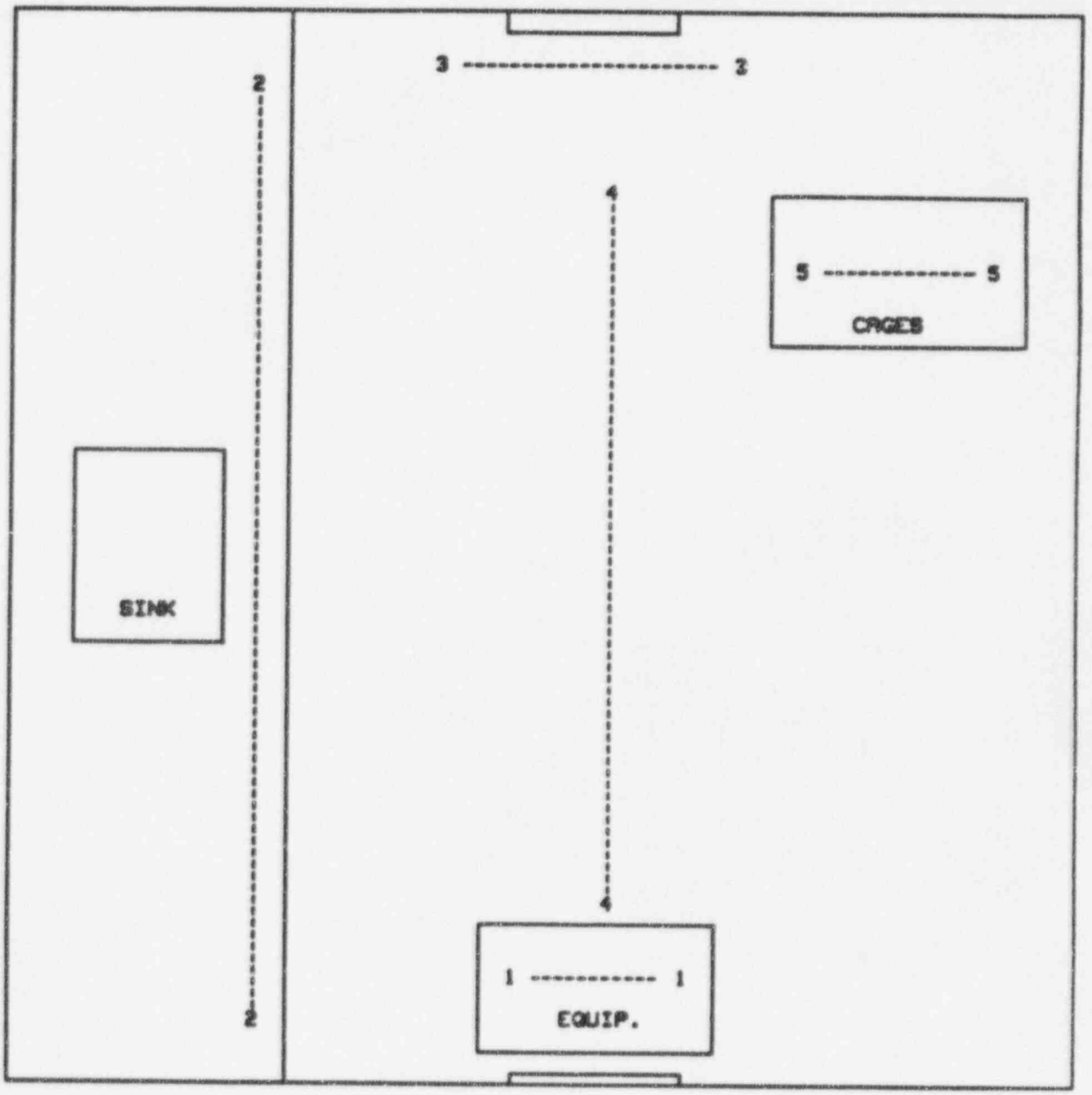
TELEDYNE ISOTOPES

DIAGRAM OF SURVEYED AREA

LOCATION: ROOM 108A

PRINCIPLE OCCUPANTS: SLUSHER, M.

ISOTOPE USAGE: I-125



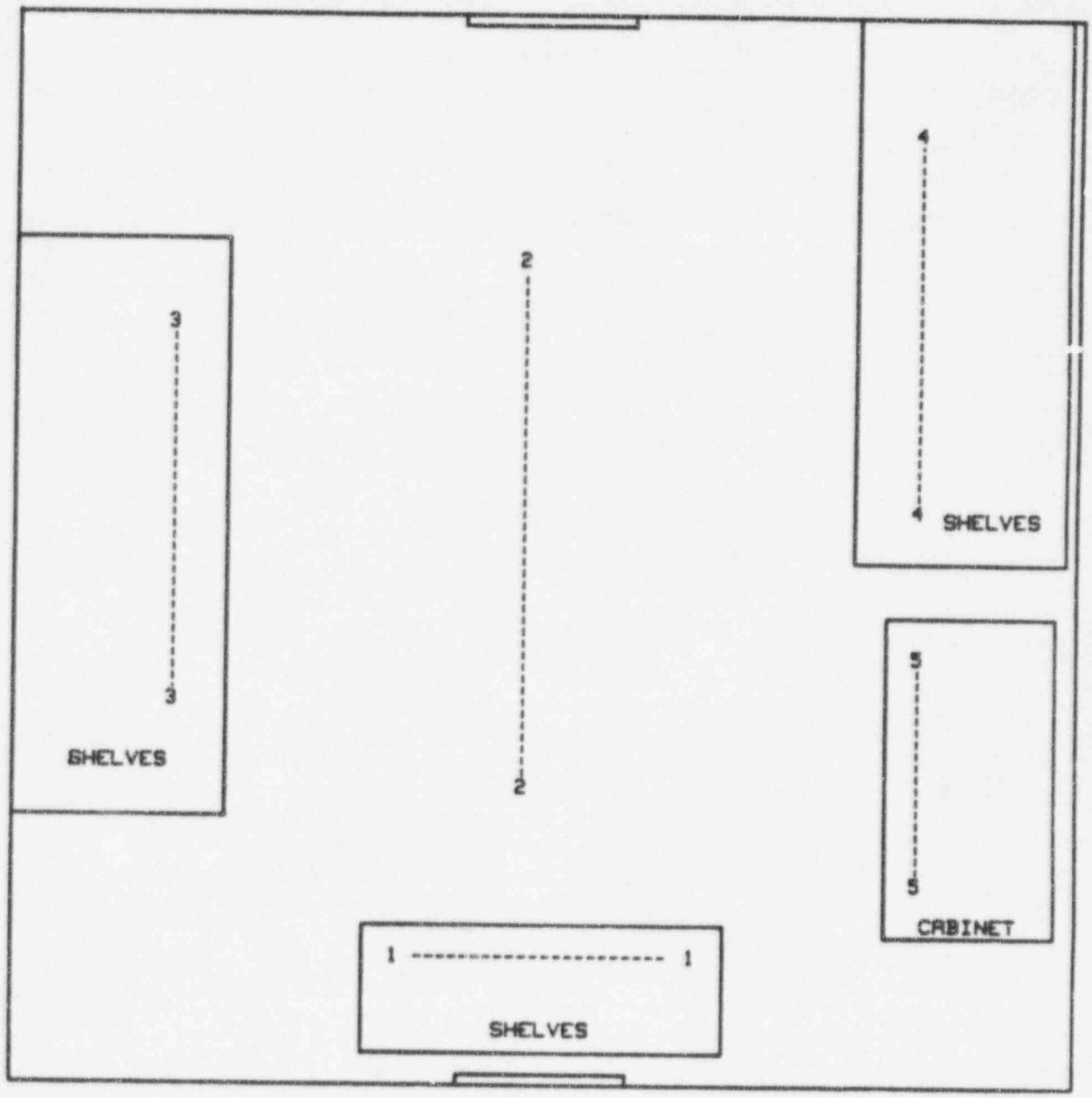
TELEDYNE ISOTOPES

DIAGRAM OF SURVEYED AREA

LOCATION: ROOM 100B STOCK ROOM

PRINCIPLE OCCUPANTS: KENCH, K.

ISOTOPE USAGE: I-125



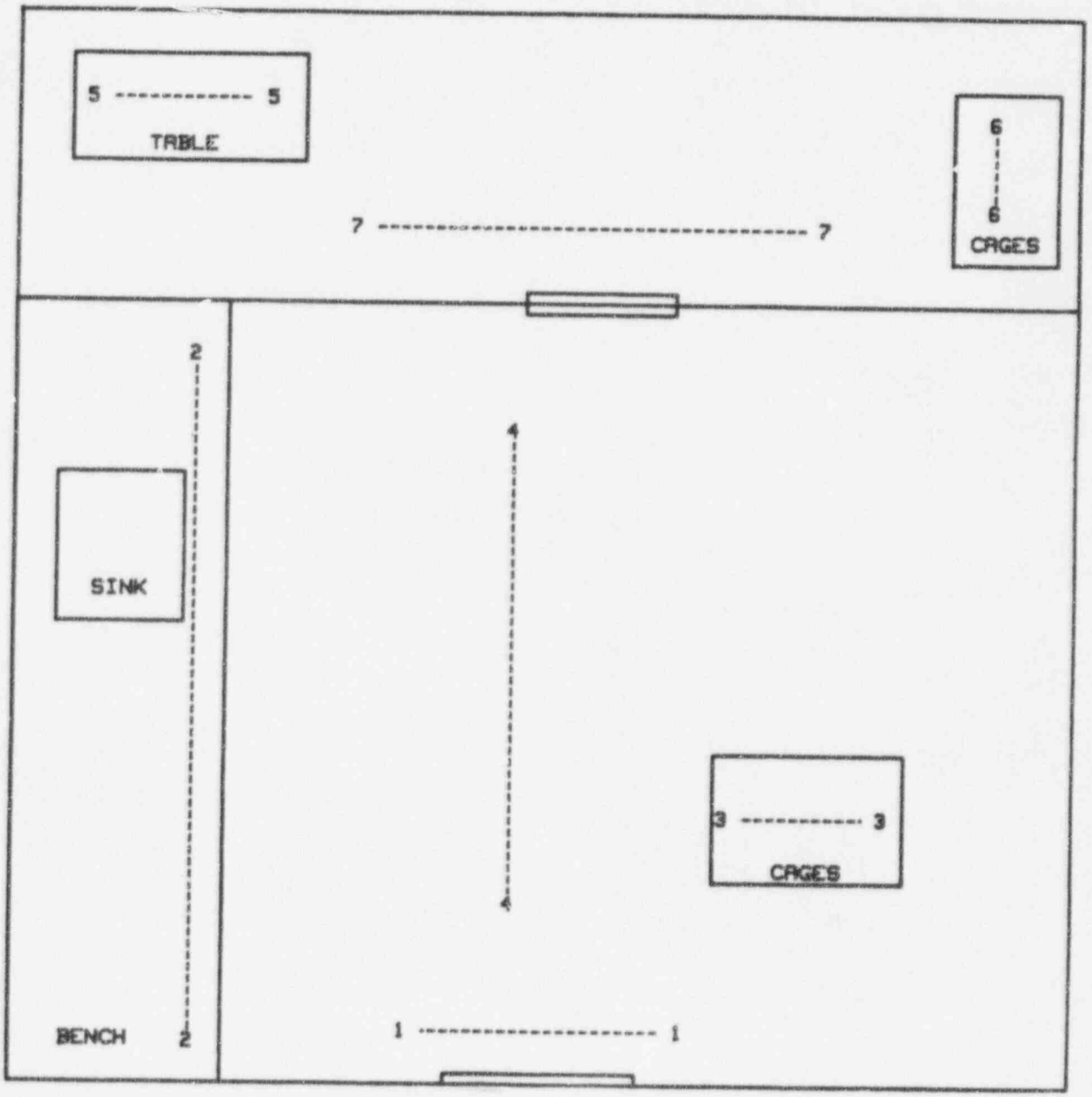
TELEDYNE ISOTOPES

DIAGRAM OF SURVEYED AREA

LOCATION: ROOM 101 A & B

PRINCIPLE OCCUPANTS: SLUSHER, M.
SHAW, B.

ISOTOPE USAGE: S-35, I-125



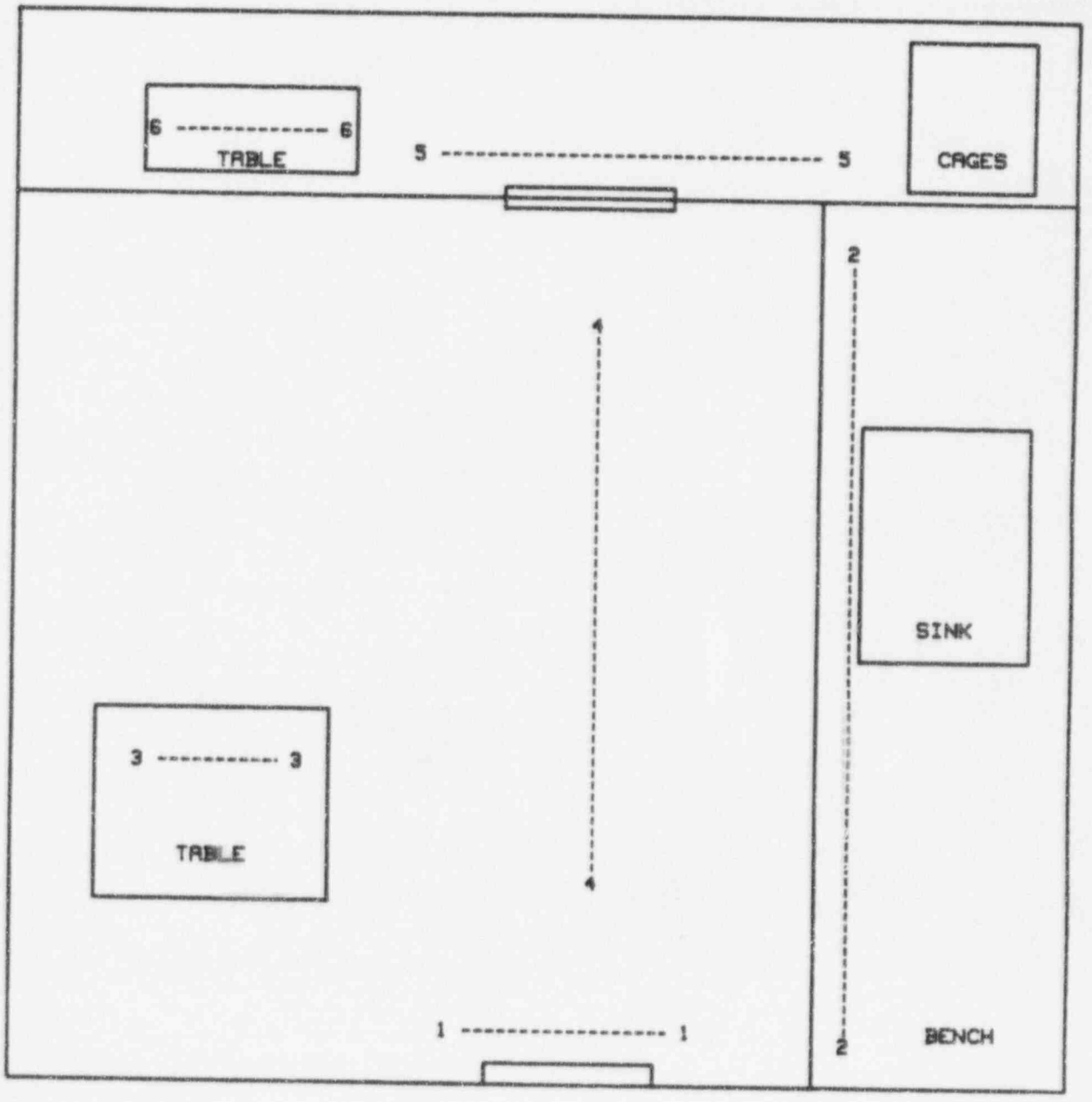
TELEDYNE ISOTOPES

DIAGRAM OF SURVEYED AREA

LOCATION: ROOM 102 A & B

PRINCIPLE OCCUPANTS: OPEN ACCESS

ISOTOPE USAGE: S-35, I-125



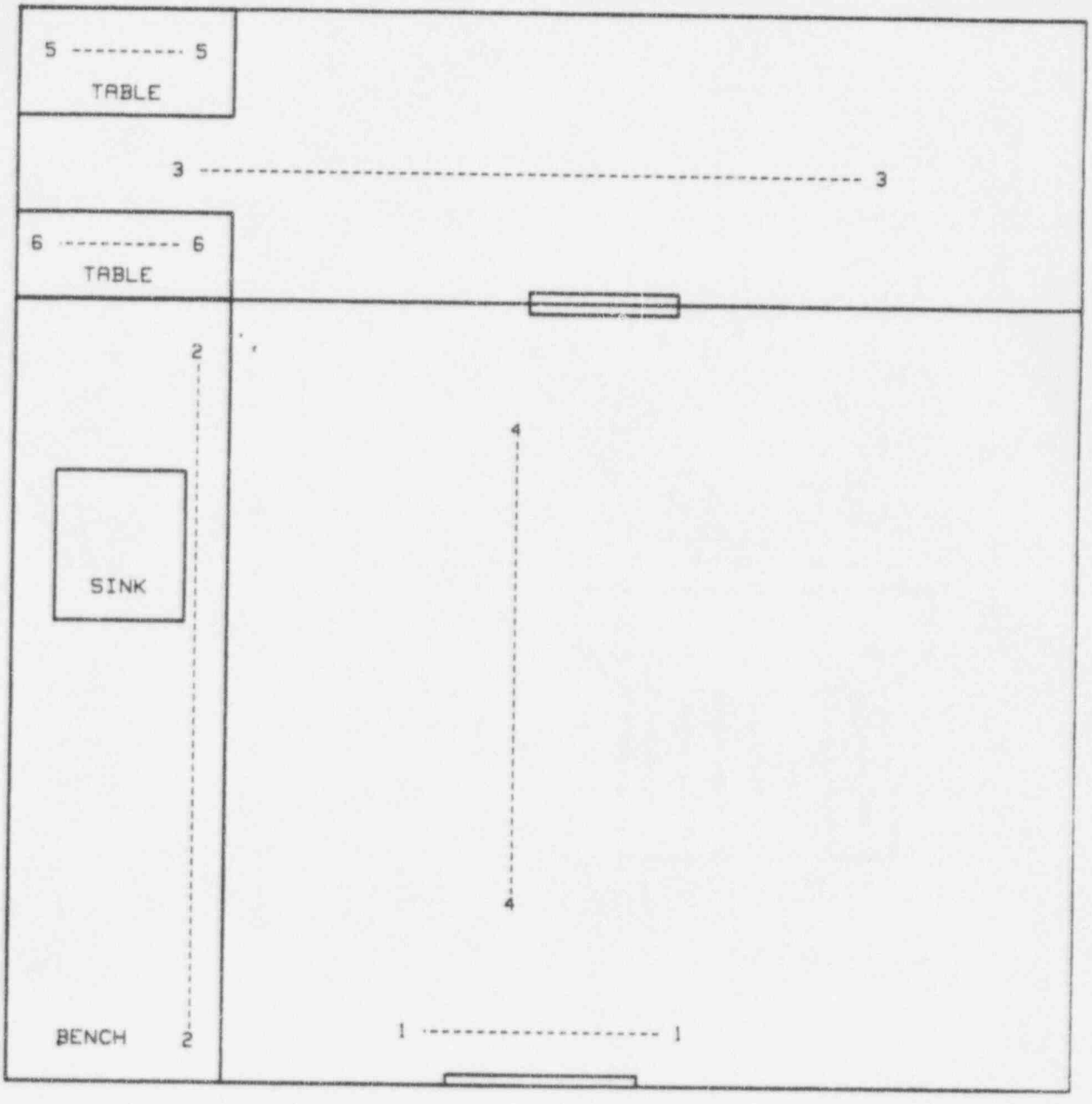
TELEDYNE ISOTOPES

DIAGRAM OF SURVEYED AREA

LOCATION: ROOM 103 A & B

PRINCIPLE OCCUPANTS: FRAZIER, D.
KENCH, K.

ISOTOPE USAGE: S-35, I-125



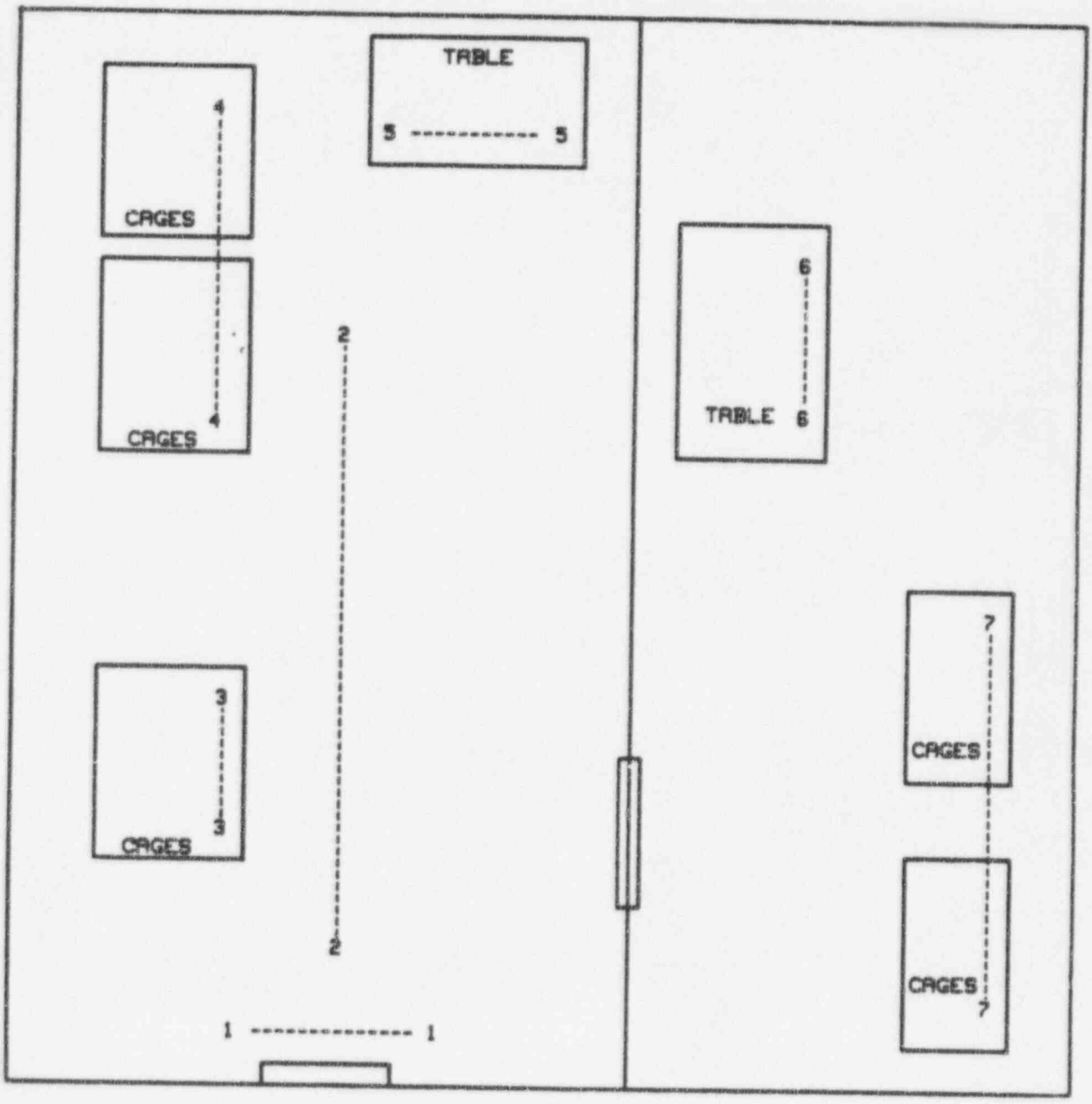
TELEDYNE ISOTOPES

DIAGRAM OF SURVEYED AREA

LOCATION: ROOM 104 A & B

PRINCIPLE OCCUPANT: OPEN ACCESS

ISOTOPE USAGE: S-35, I-125, Cr-51



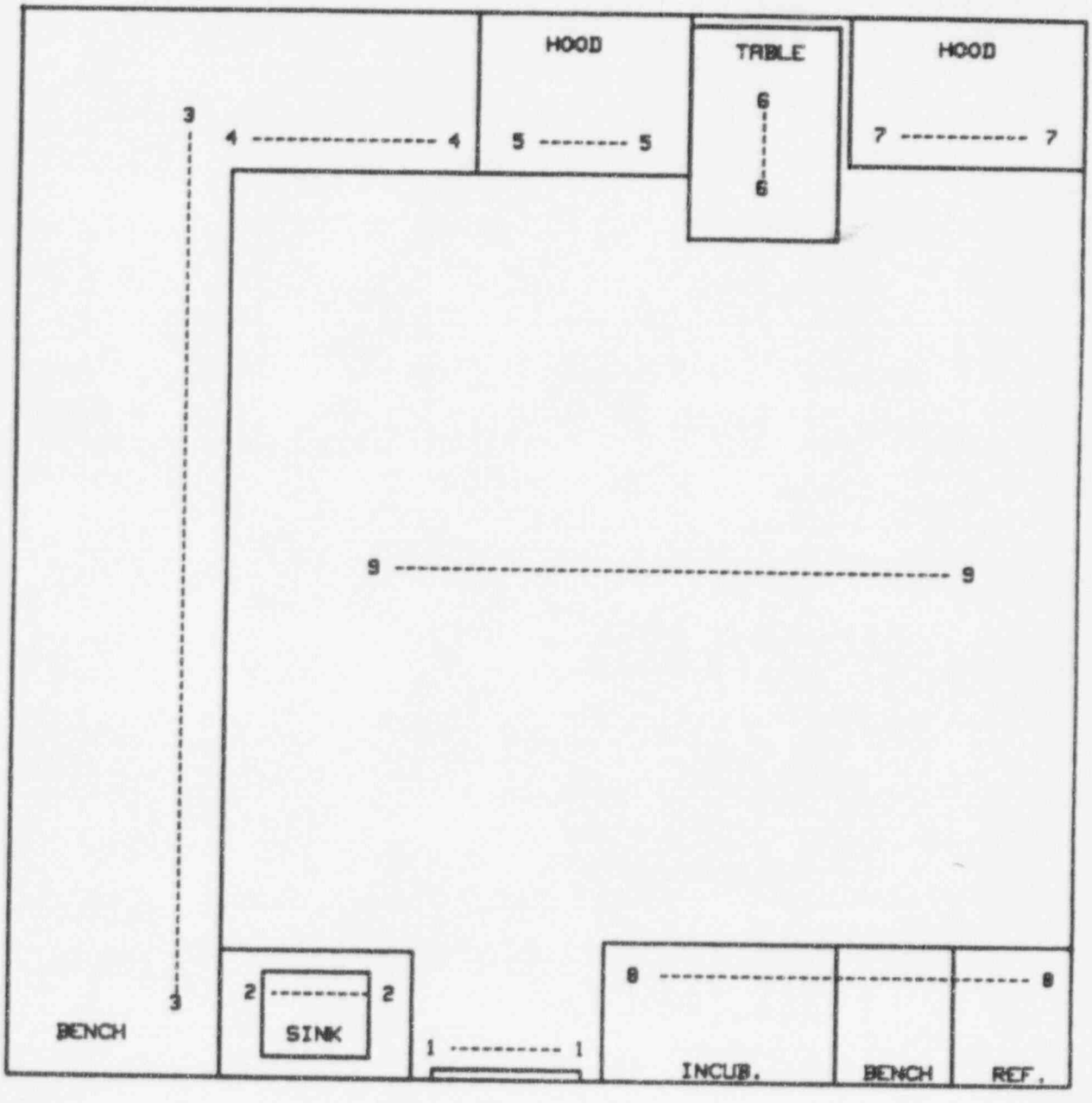
TELEDYNE ISOTOPES

DIAGRAM OF SURVEYED AREA

LOCATION: BACTERIOLOGY

PRINCIPLE OCCUPANTS: FRAZIER, D.
SCHULTZ, S.

ISOTOPE USAGE: H-3, Cr-51



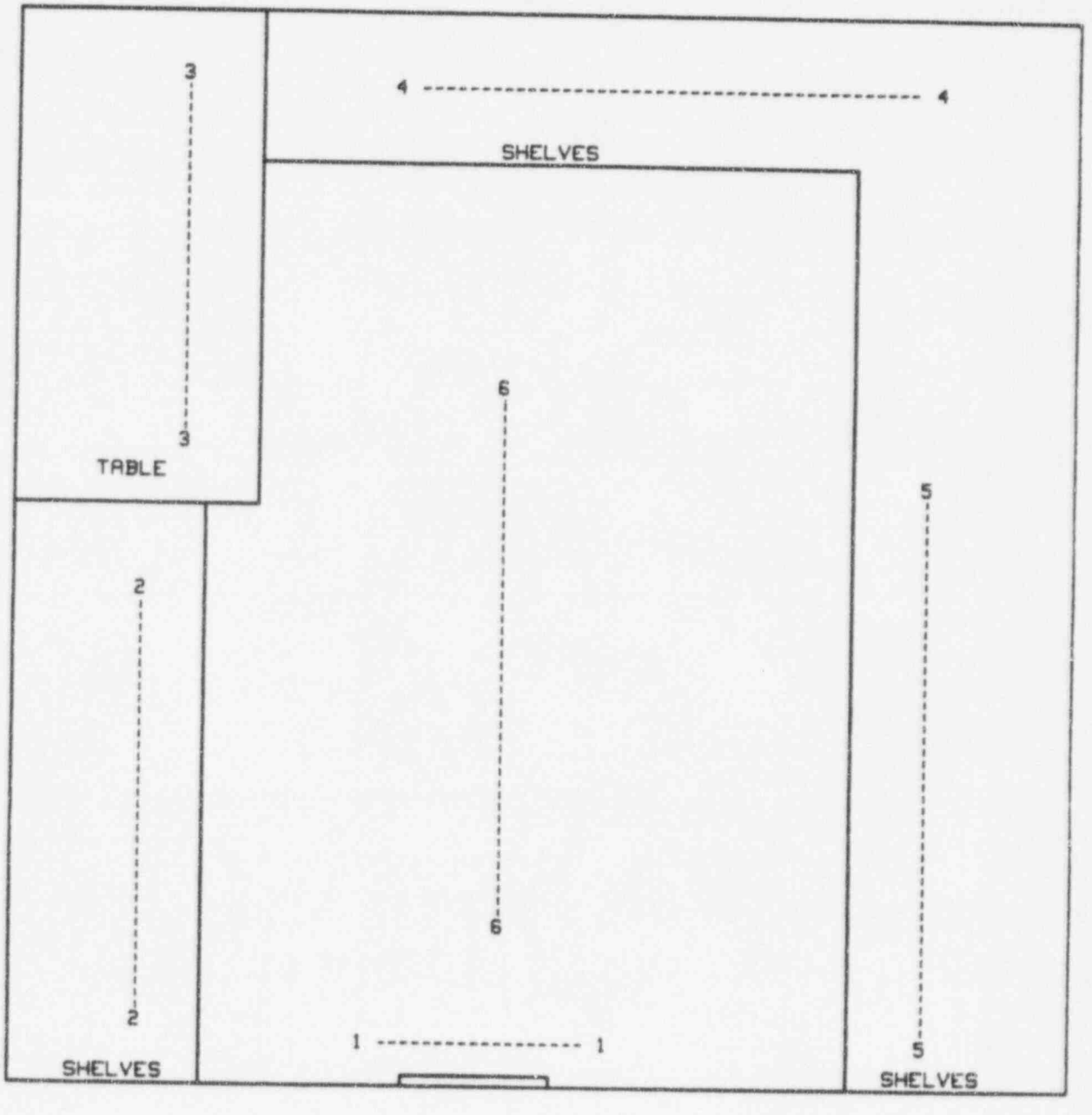
TELEDYNE ISOTOPES

DIAGRAM OF SURVEYED AREA

LOCATION: COLD ROOM

PRINCIPLE OCCUPANTS: OPEN ACCESS

ISOTOPE USAGE: H-3, I-125, C-14, Fe-59



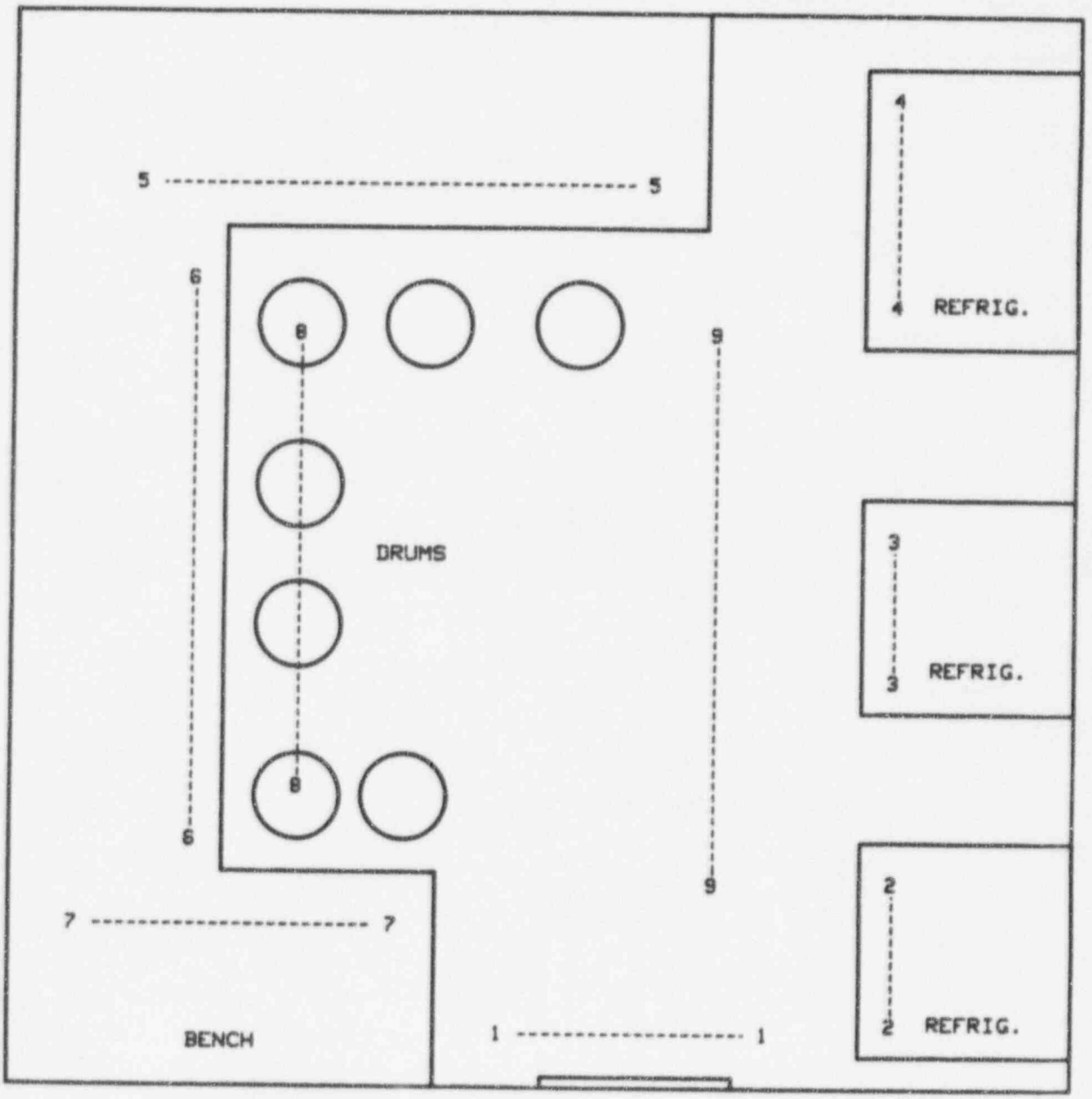
TELEDYNE ISOTOPES

DIAGRAM OF SURVEYED AREA

LOCATION: WASTE ROOM

PRINCIPLE OCCUPANTS: OPEN ACCESS

ISOTOPE USAGE: ALL



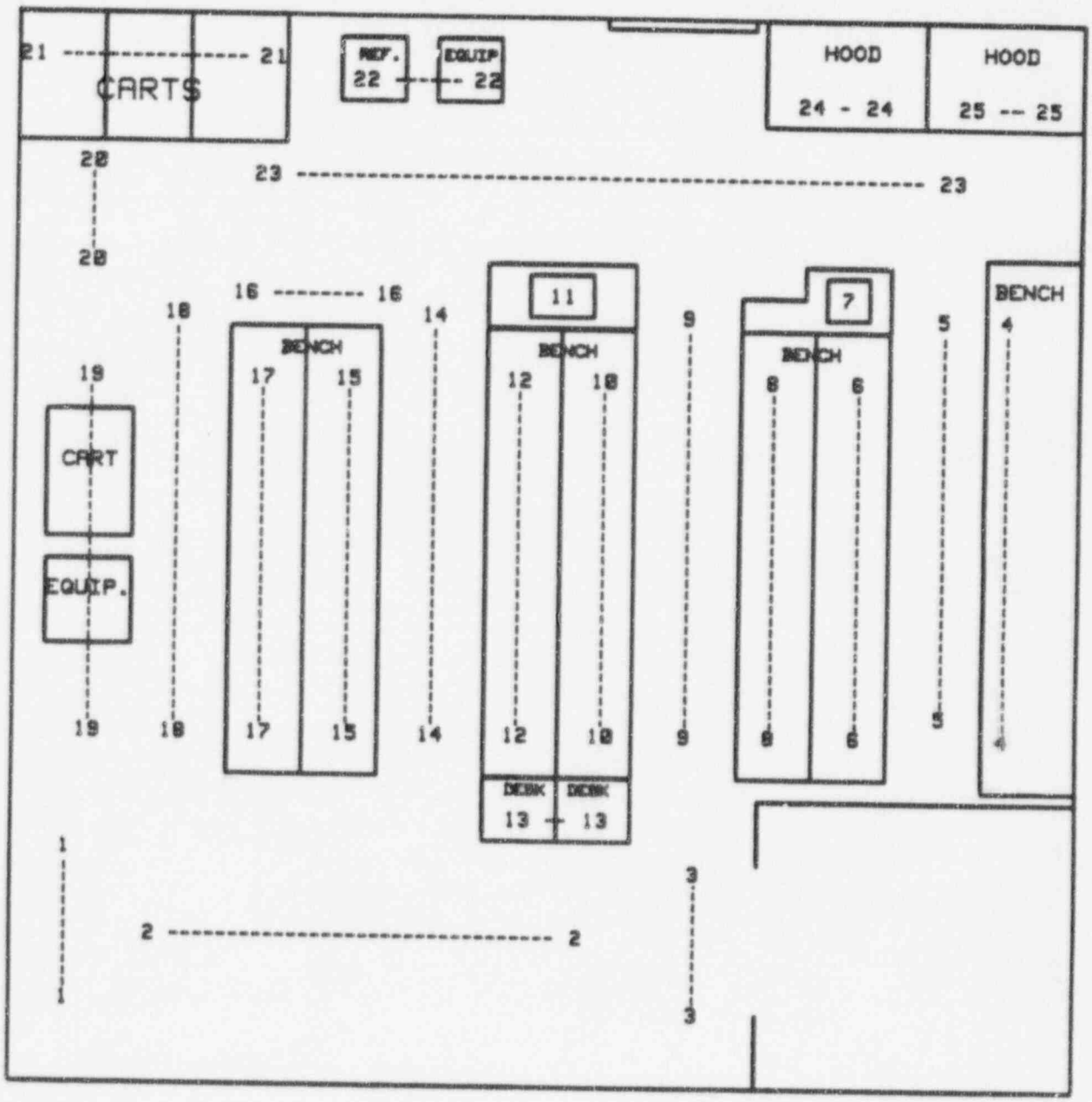
TELEDYNE ISOTOPES

DIAGRAM OF SURVEYED AREA

LOCATION: MAIN LABORATORY-B

PRINCIPLE OCCUPANTS: OPEN ACCESS

ISOTOPE USAGE: H-3, I-125, C-14, S-35, Cr-51, Fe-55



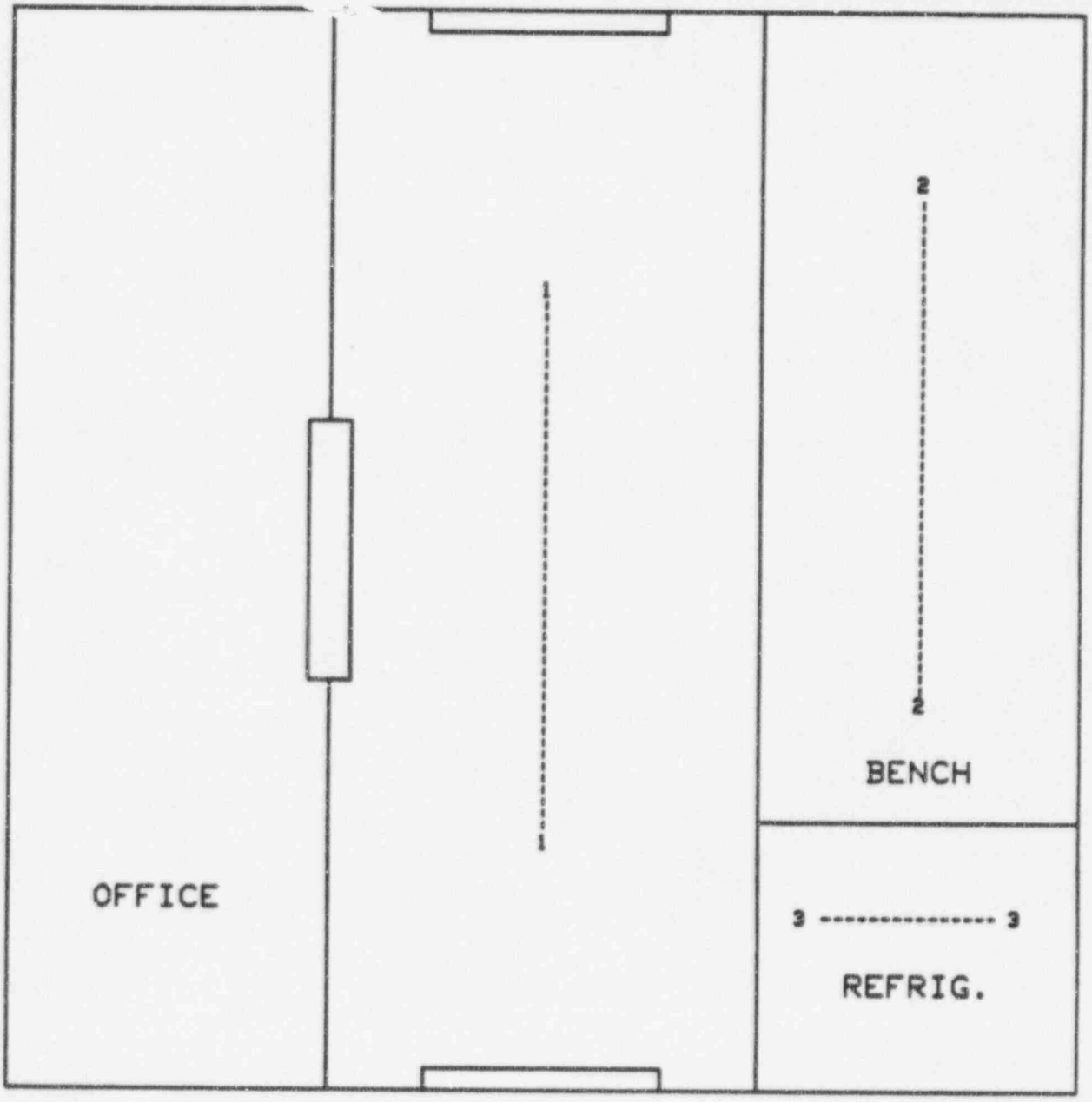
TELEDYNE ISOTOPES

DIAGRAM OF SURVEYED AREA

LOCATION: SHIPPING/RECEIVING AREA

PRINCIPLE OCCUPANTS: OPEN ACCESS

ISOTOPE USAGE:



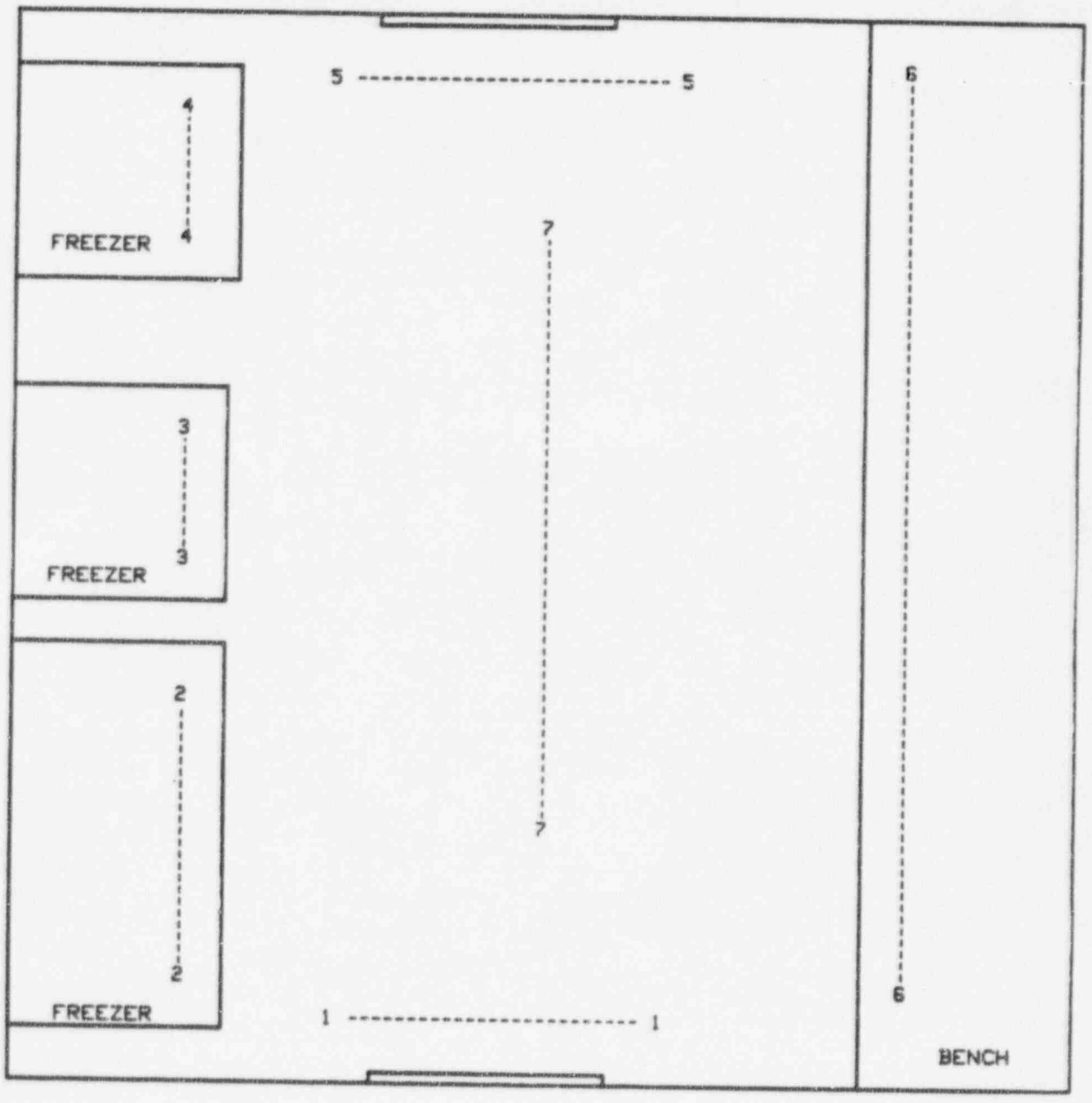
TELEDYNE ISOTOPES

DIAGRAM OF SURVEYED AREA

LOCATION: MAIN LABORATORY HALL

PRINCIPLE OCCUPANTS: OPEN ACCESS

ISOTOPE USAGE: H-3, C-14, Fe-59, I-125, Zn-65, S-35, Cr-51



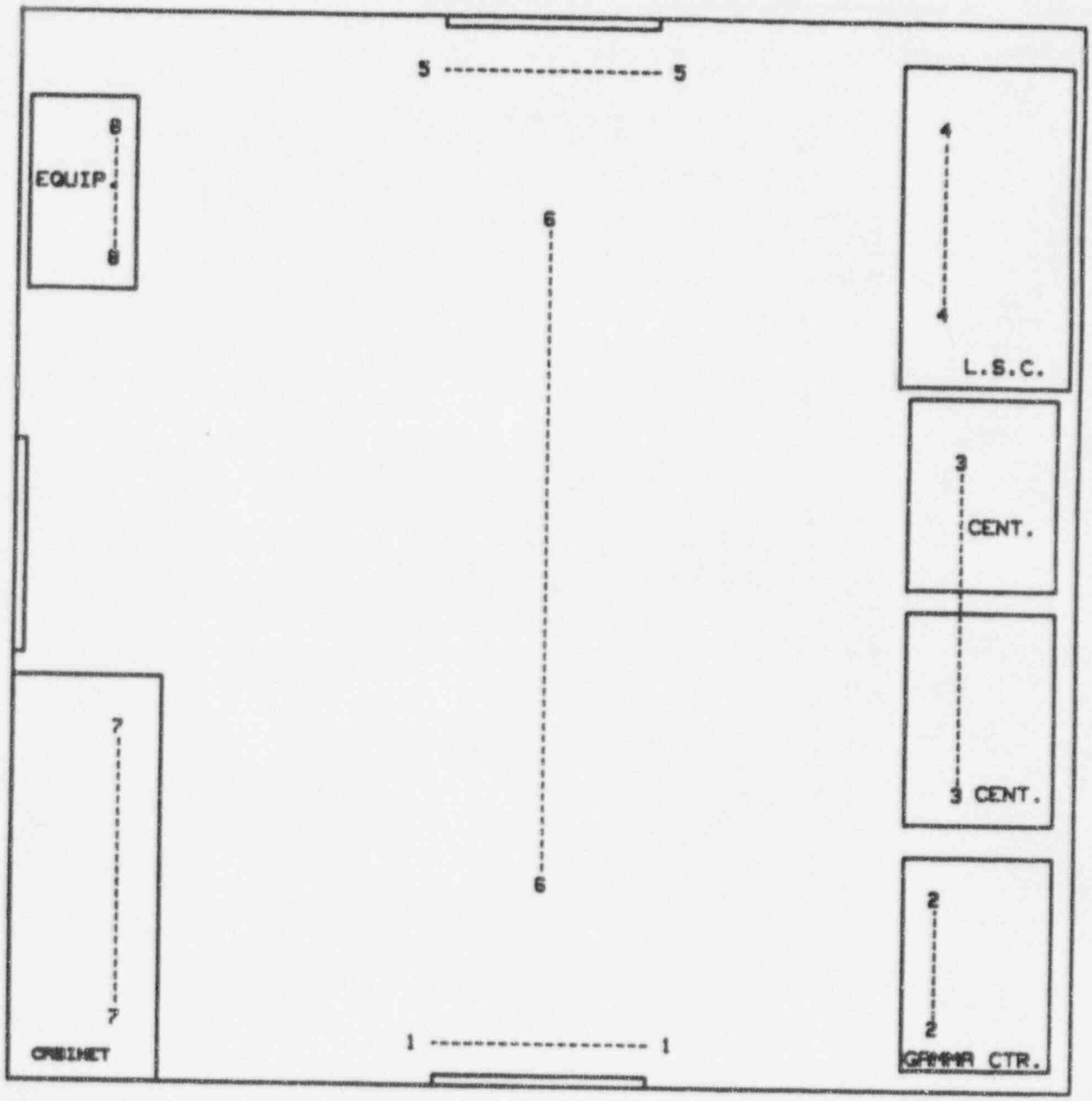
TELEDYNE ISOTOPES

DIAGRAM OF SURVEYED AREA

LOCATION: INSTRUMENT HALL

PRINCIPLE OCCUPANTS: OPEN ACCESS

ISOTOPE USAGE: H-3, C-14, I-125



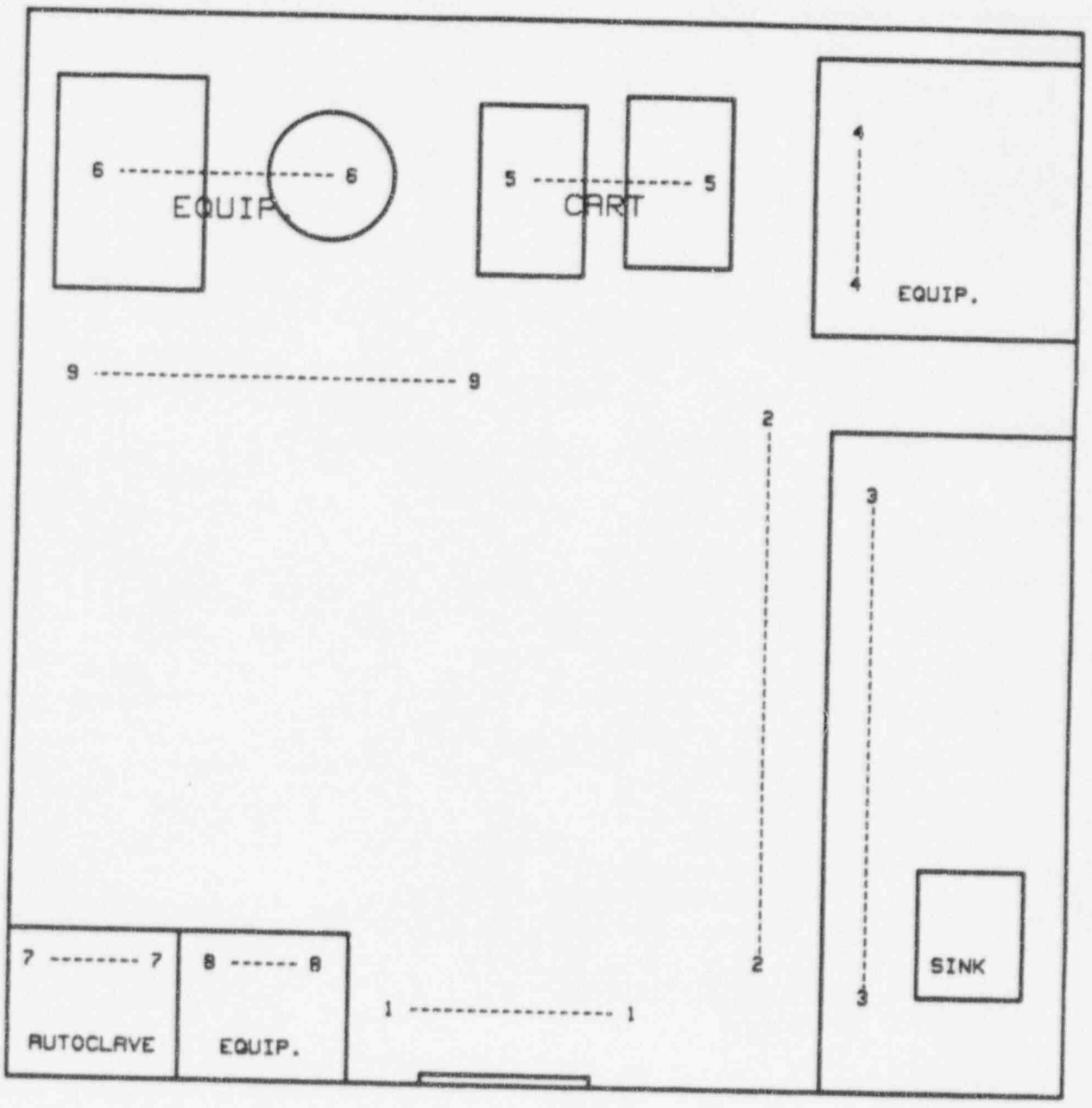
TELEDYNE ISOTOPES

DIAGRAM OF SURVEYED AREA

LOCATION: LAB PREP ROOM

PRINCIPLE OCCUPANTS: OPEN ACCESS

ISOTOPE USAGE: NONE



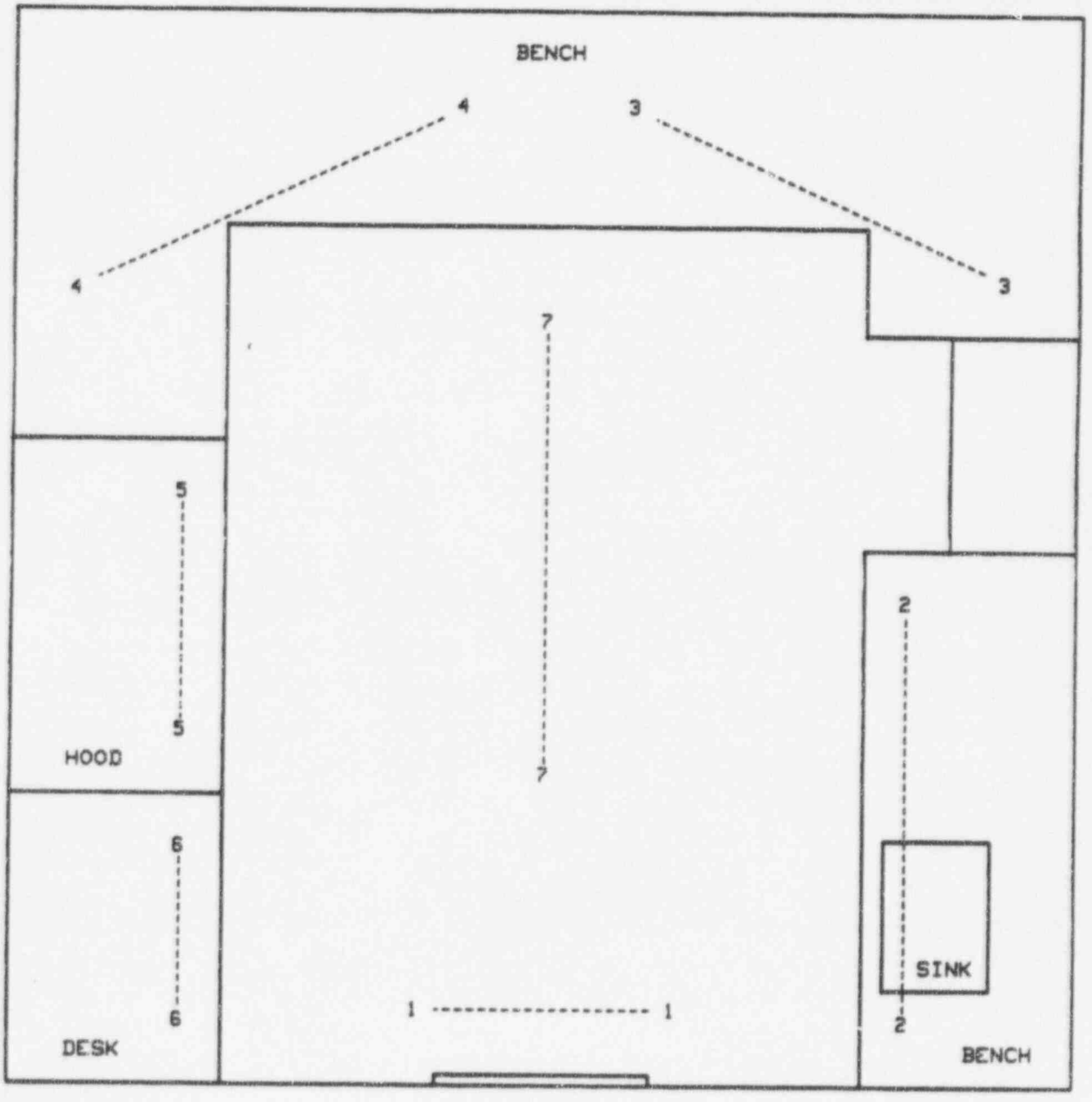
TELEDYNE ISOTOPES

DIAGRAM OF SURVEYED AREA

LOCATION: ORGANIC LAB

PRINCIPLE OCCUPANTS: OPEN ACCESS

ISOTOPE USAGE: H-3, C-14



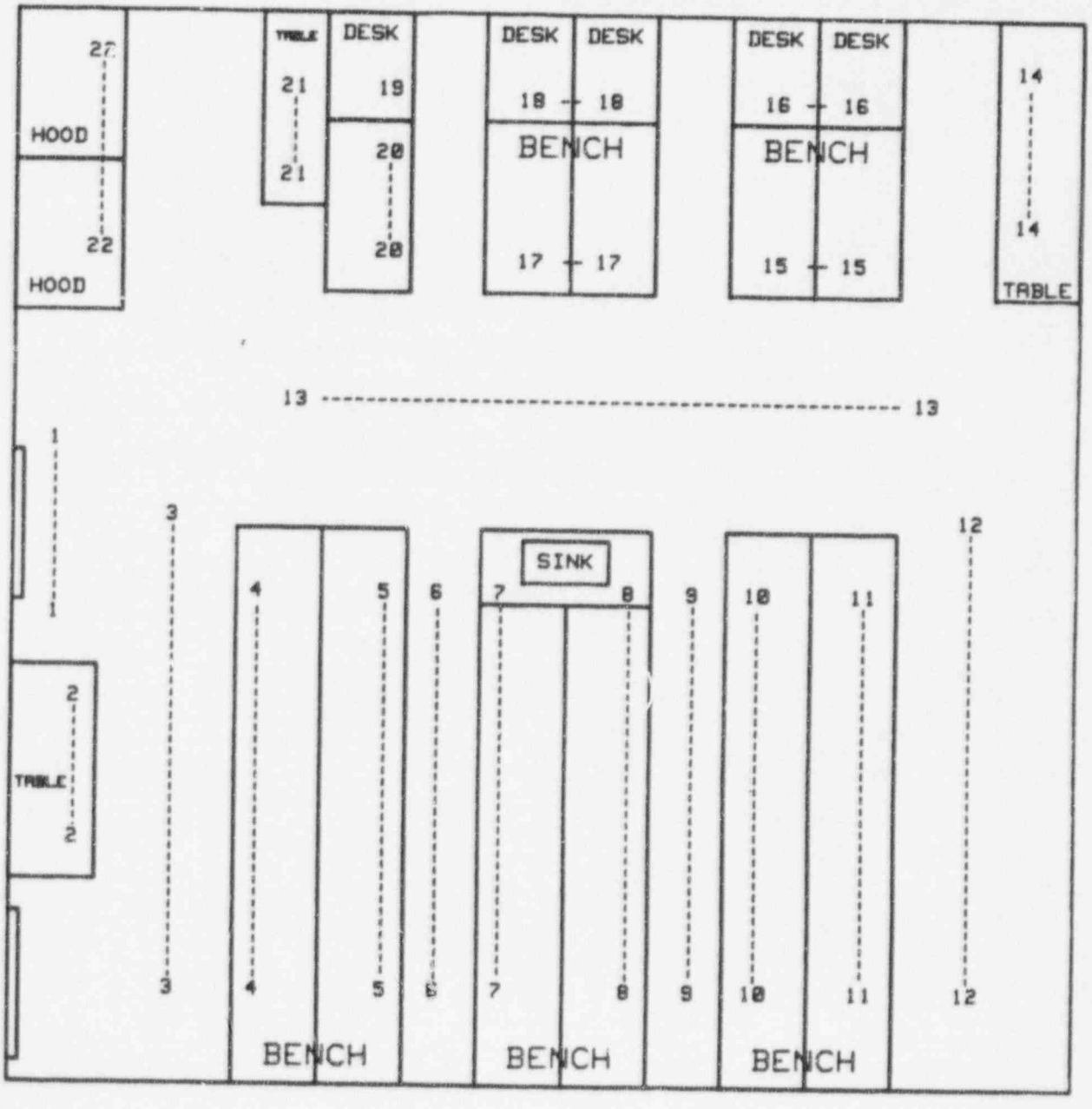
TELEDYNE ISOTOPES

DIAGRAM OF SURVEYED AREA

LOCATION: MAIN LABORATORY - C (WINDOW)

PRINCIPLE OCCUPANTS: OPEN ACCESS

ISOTOPE USAGE: H-3, C-14, Fe-59, I-125, Zn-65, S-35, Cr-51



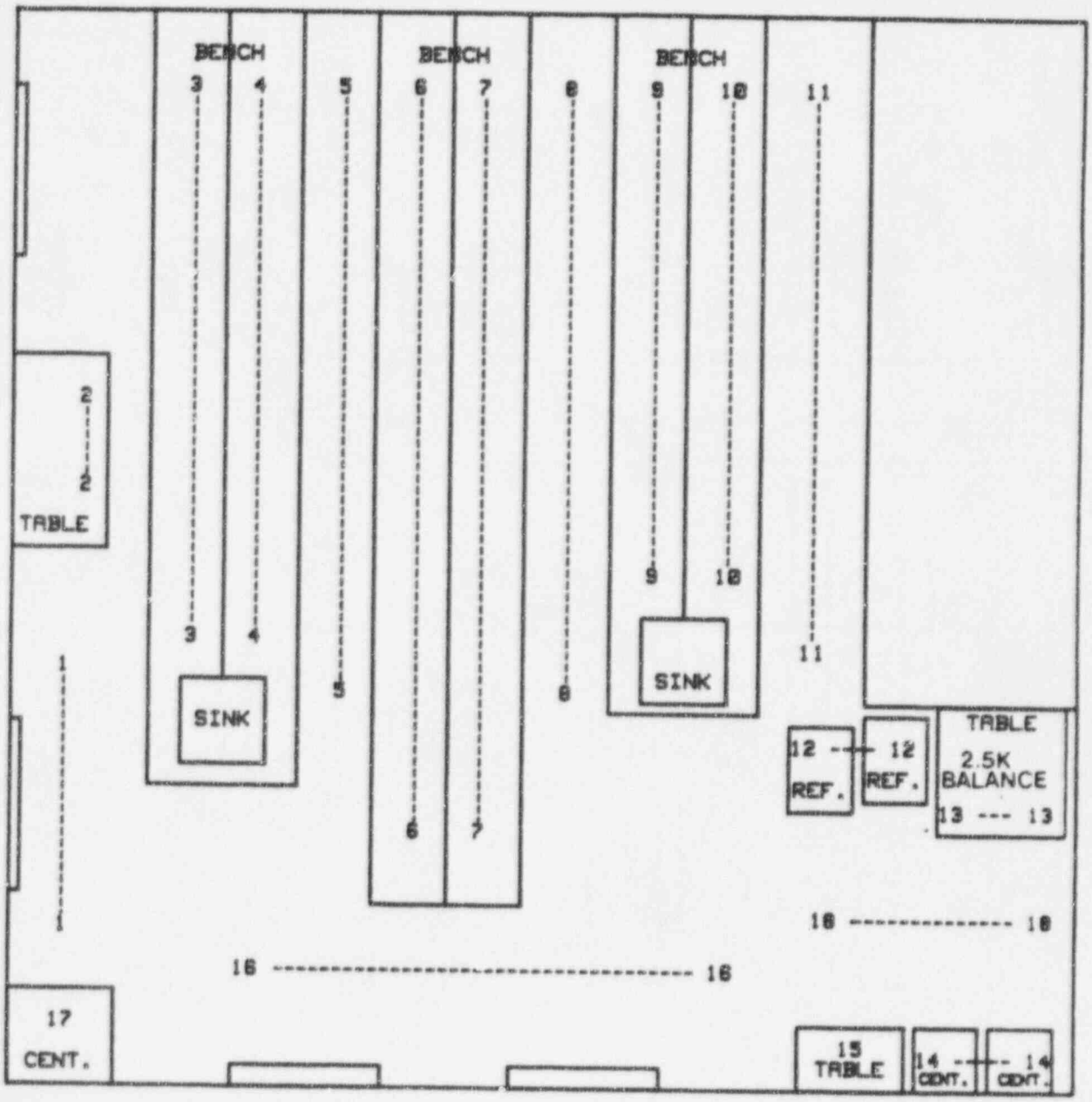
TELEDYNE ISOTOPES

DIAGRAM OF SURVEYED AREA

LOCATION: MAIN LABORATORY C (NO WINDOW)

PRINCIPLE OCCUPANTS: OPEN ACCESS

ISOTOPE USAGE: H-3, C-14, Fe-59, I-125, Zn-65, S-35, Cr-51



TELEDYNE ISOTOPES

DIAGRAM OF SURVEYED AREA

LOCATION: CELL CULTURE ROOM

PRINCIPLE OCCUPANTS: COLBY, S.
SAVAGE, K.

ISOTOPE USAGE:

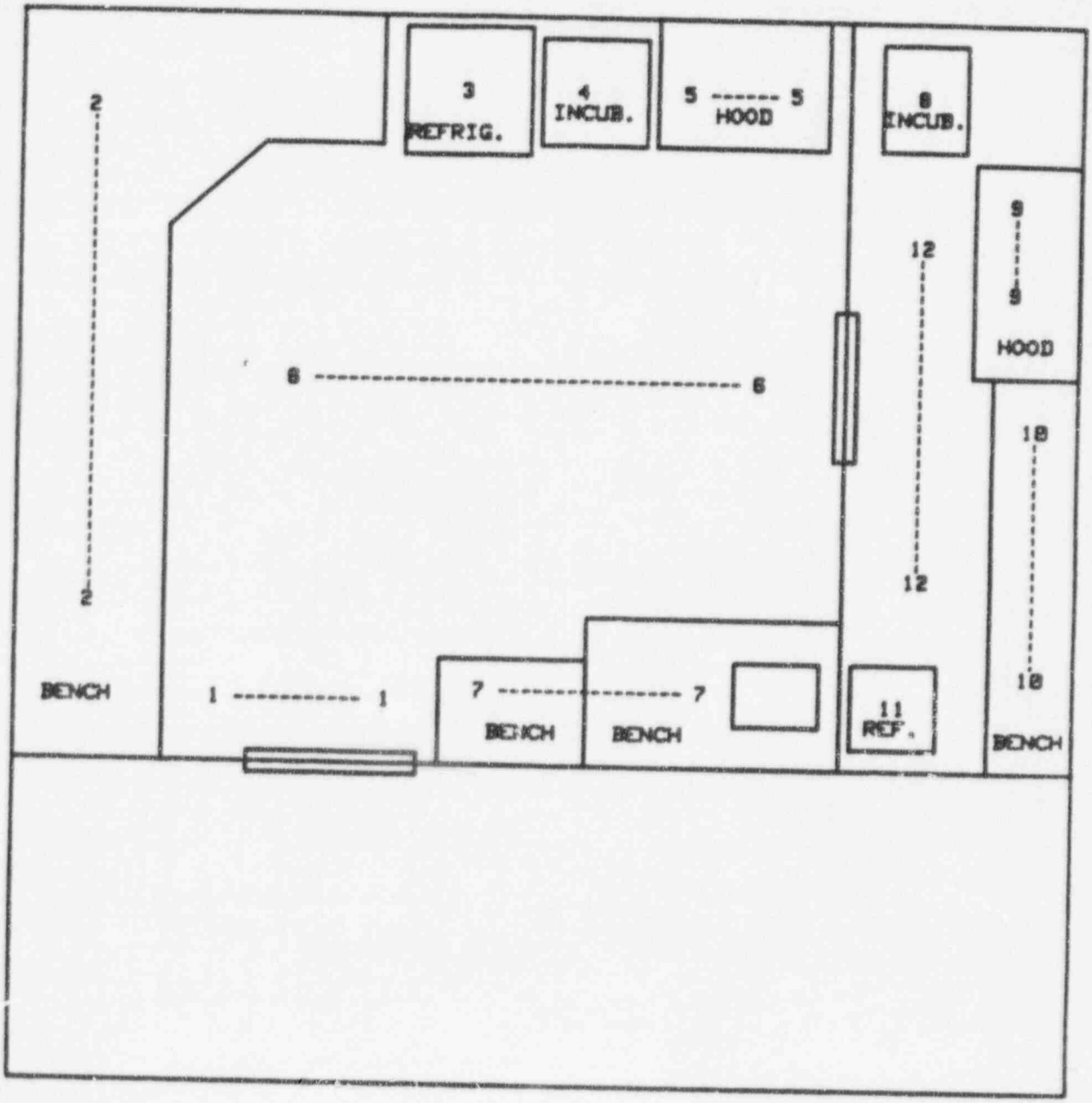


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DIAGRAM OF SURVEYED AREA

TELEDYNE
BROWN ENGINEERING
Environmental Services

LOCATION: TRAILER- LAB #1

PRINCIPAL OCCUPANTS: _____

ISOTOPE USAGE: _____

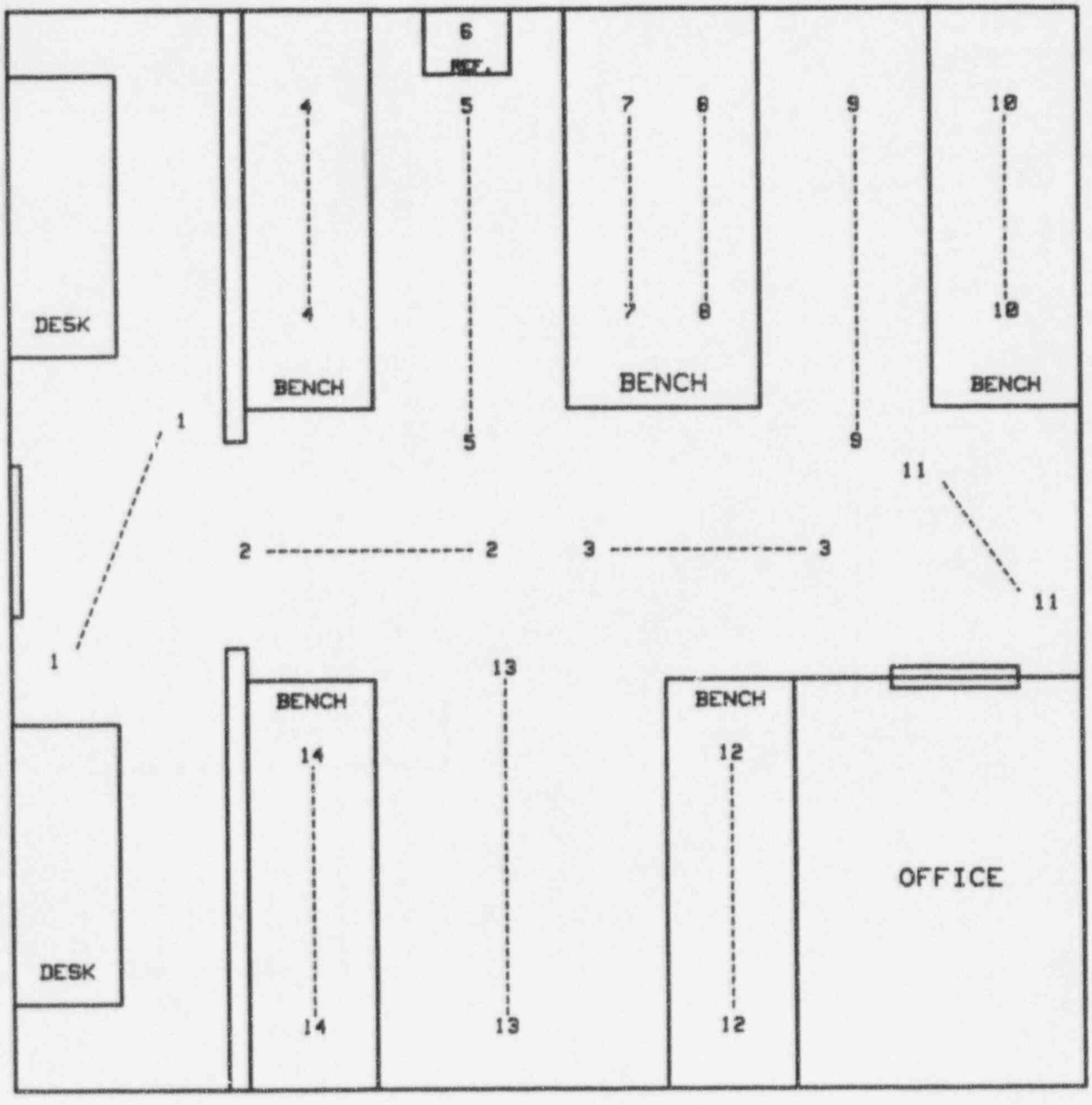


DIAGRAM OF SURVEYED AREA

TELEDYNE
BROWN ENGINEERING
Environmental Services

LOCATION: TRAILER - LAB #2

PRINCIPAL OCCUPANTS: _____

ISOTOPE USAGE: _____

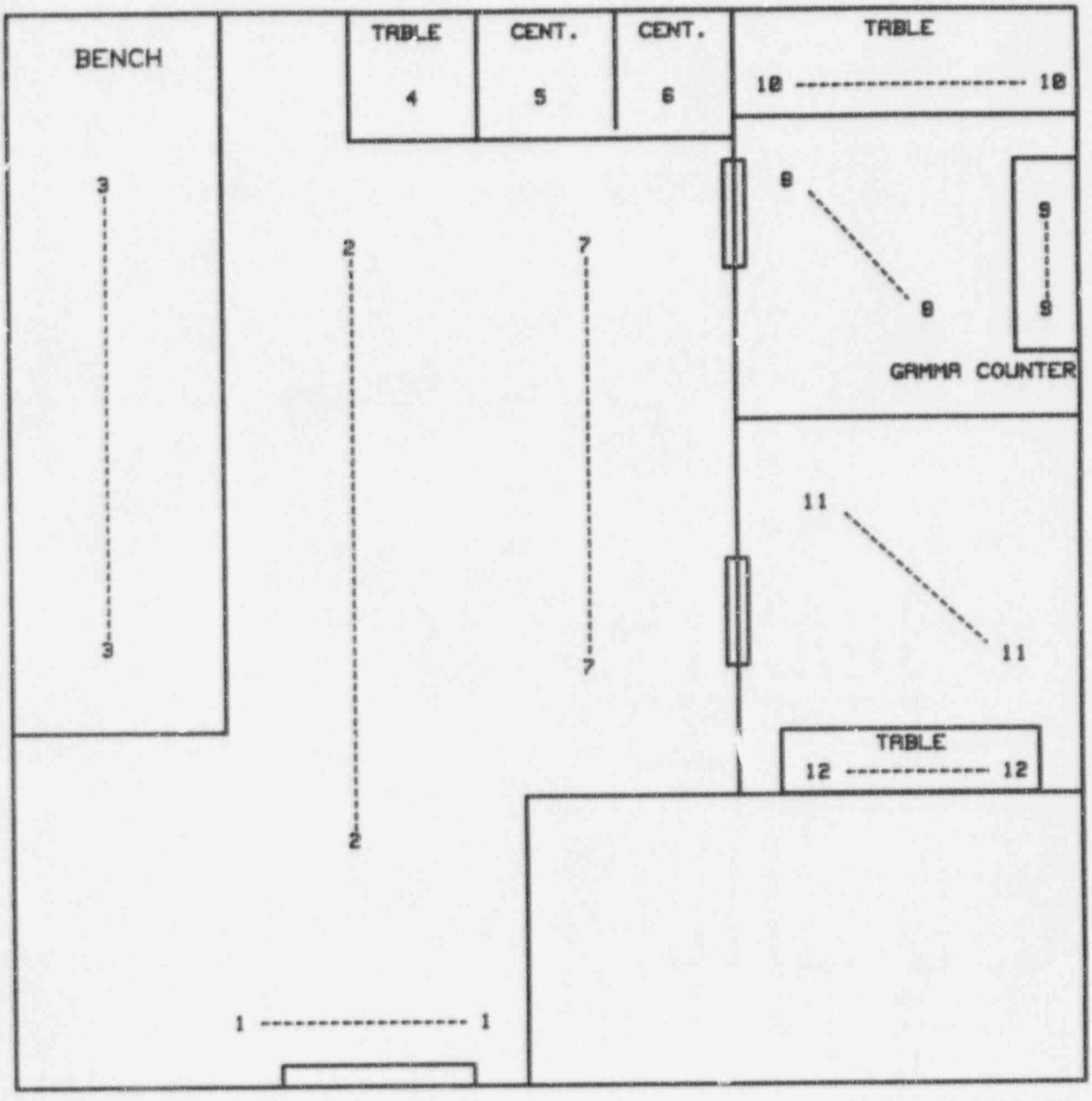


DIAGRAM OF SURVEYED AREA

TELEDYNE
BROWN ENGINEERING
Environmental Services

LOCATION: TRAILER - HOOD

PRINCIPAL OCCUPANTS: _____

ISOTOPE USAGE: _____

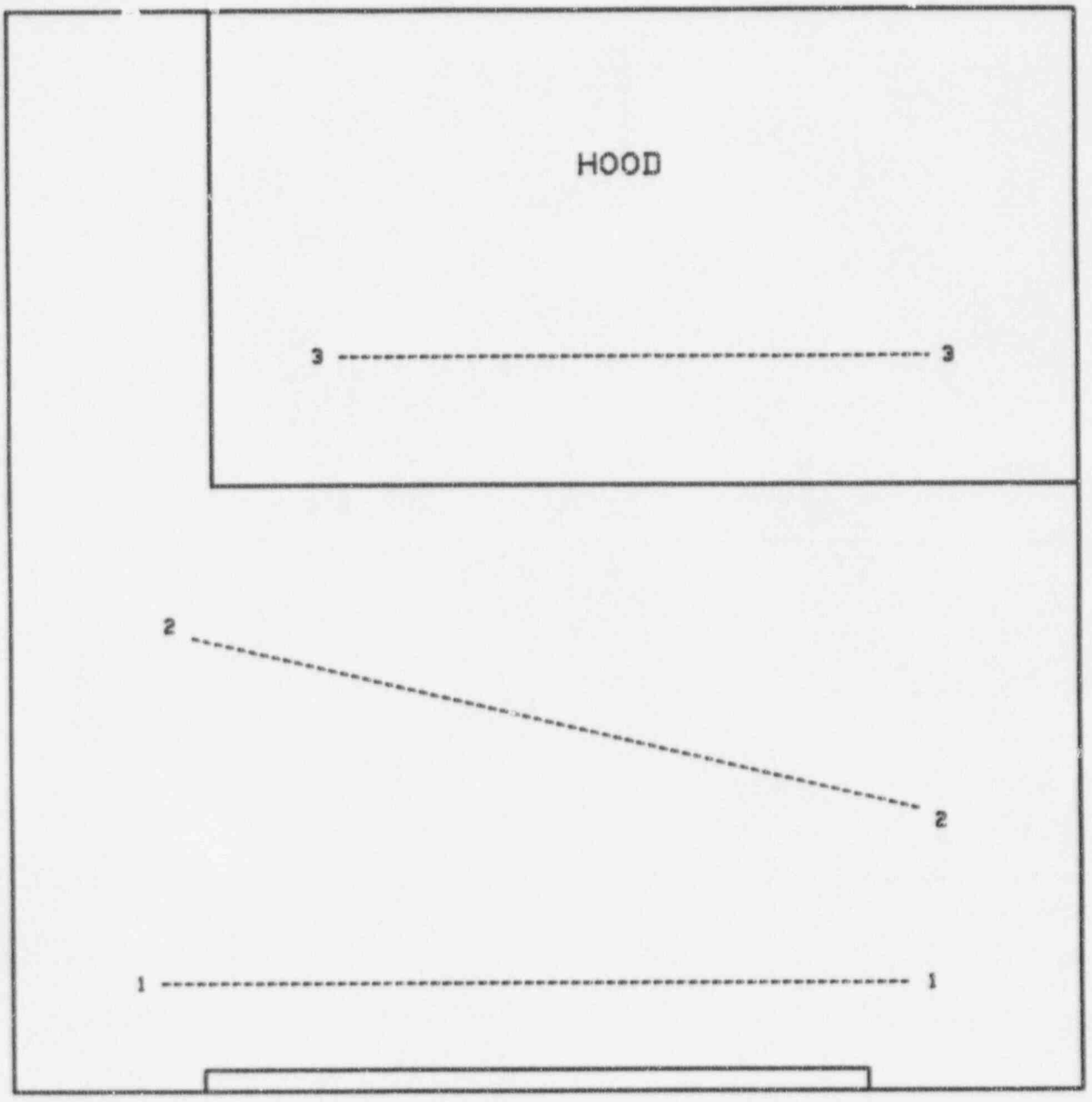


DIAGRAM OF SURVEYED AREA

TELEDYNE
BROWN ENGINEERING
Environmental Services

LOCATION: TRAILER- LAB #3

PRINCIPAL OCCUPANTS: _____

ISOTOPE USAGE: _____

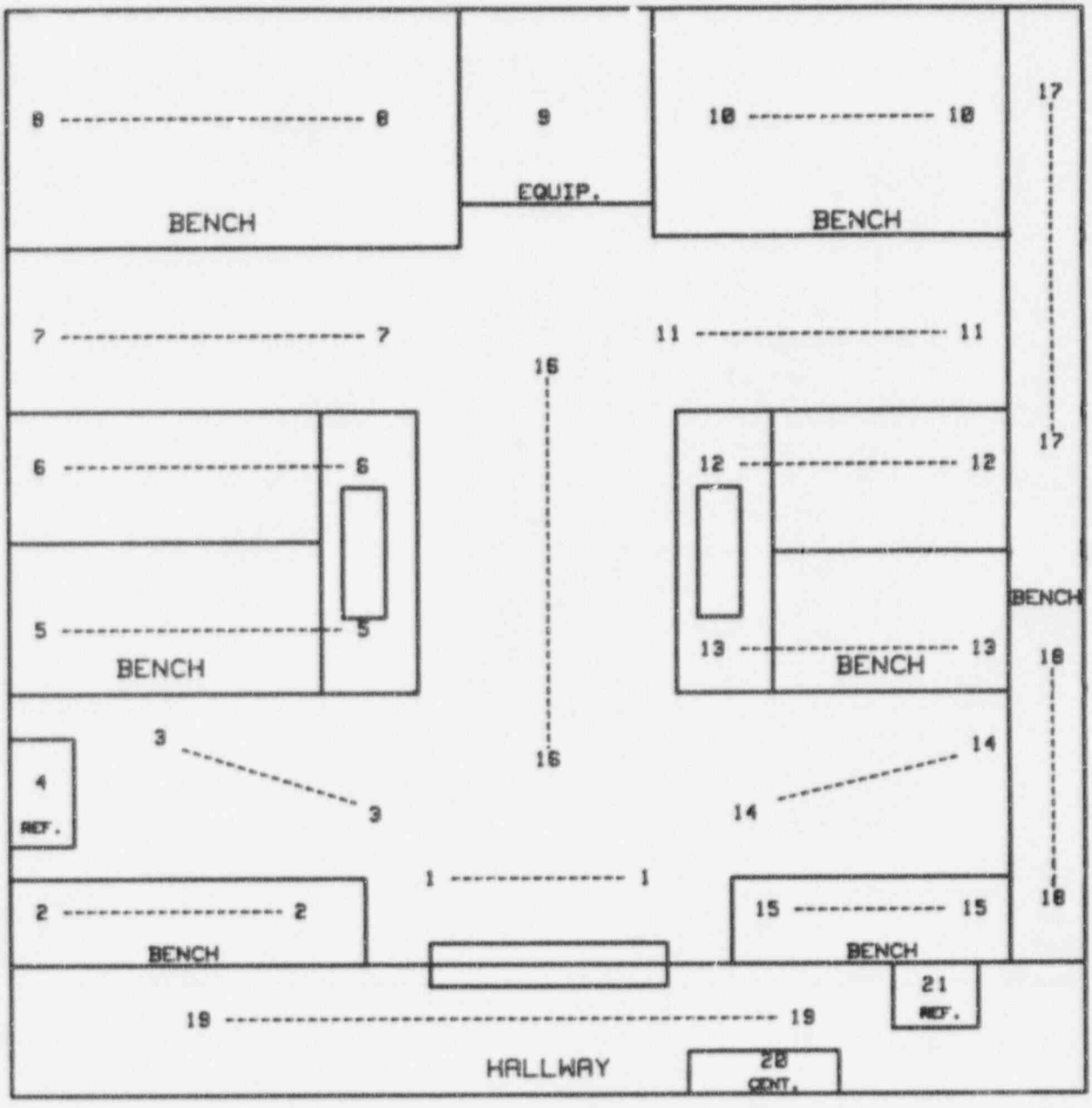


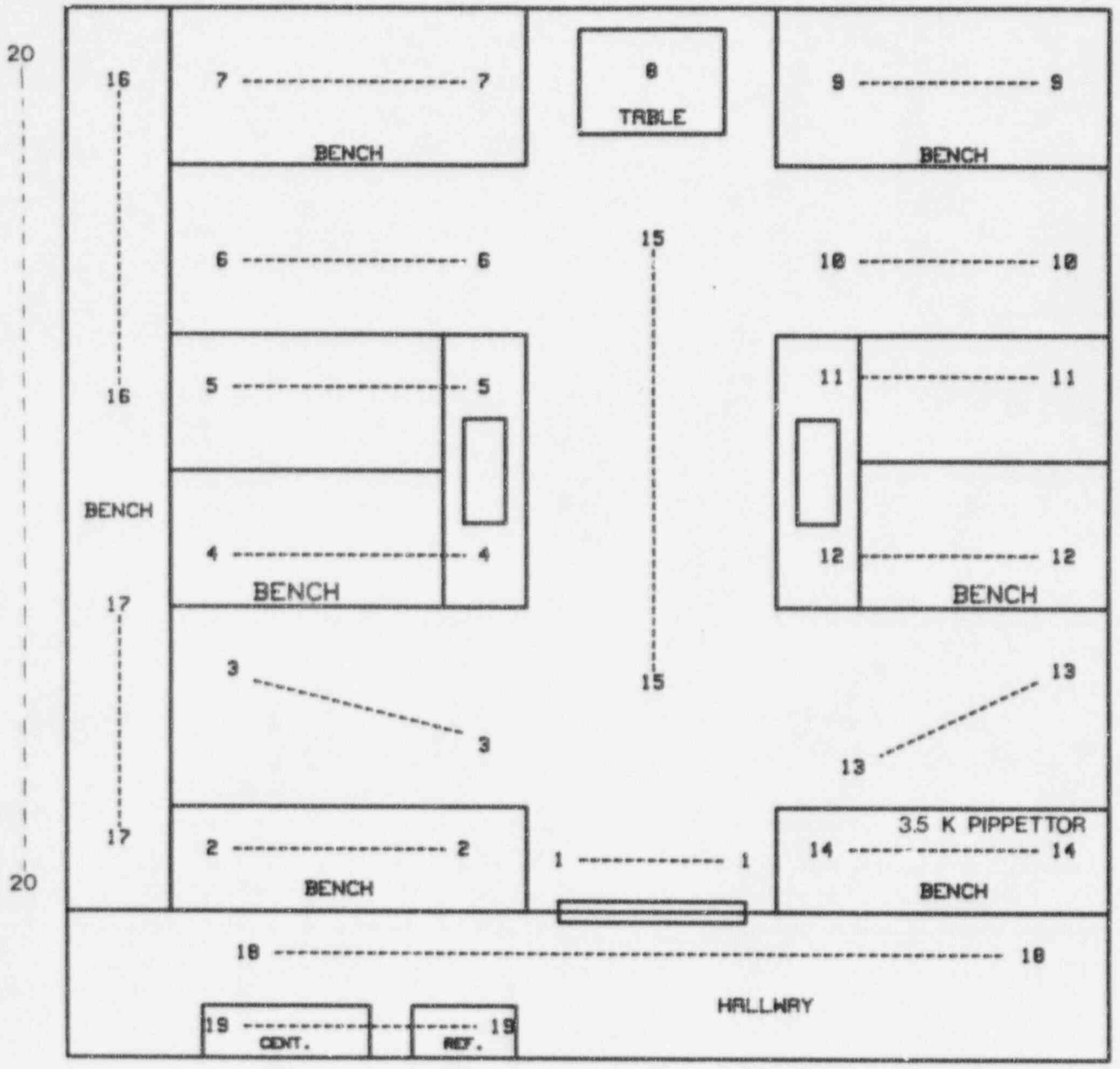
DIAGRAM OF SURVEYED AREA

TELEDYNE
BROWN ENGINEERING
Environmental Services

LOCATION: TRAILER - LAP #4

PRINCIPAL OCCUPANTS: _____

ISOTOPE USAGE: _____



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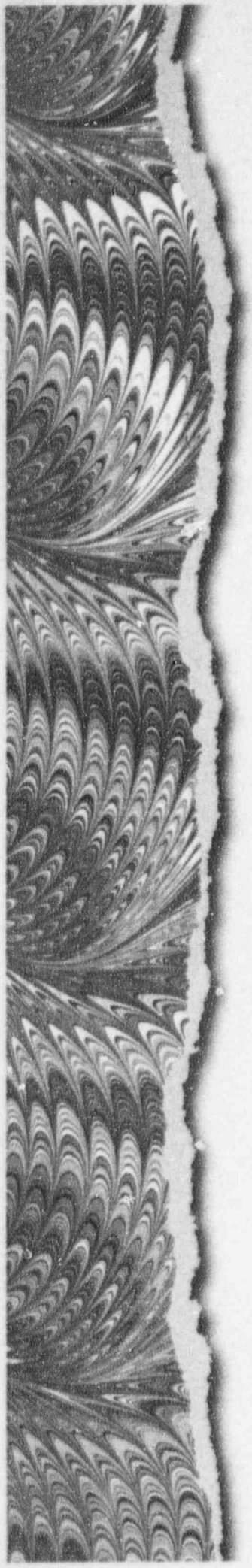

TELEDYNE BROWN ENGINEERING
Environmental Services

Radiological Services Department
50 Van Buren Avenue
Westwood ◆ NJ ◆ 07675-1235
Phone ◆ 800-666-0222
FAX ◆ 201-664-5586

CHEMICAL

Chemical Bank New Jersey NA
International Division
334 Madison Avenue
Morristown, NJ 07960

ISSUE DATE: JULY 15, 1994
L/C NO.: P-232687

M516
K-2

29-19918-01

Advising Bank

********** DIRECT **********

APPLICANT:
THE LIPOSOME COMPANY INC.
ONE REARCH WAY
PRINCETON, N.J. 08540

MAIL TO

Beneficiary

U.S. NUCLEAR REGULATORY COMMISSION
REGION 1: 475 ALLENDALE ROAD
KING OF PRUSSIA, PA 19406-1415

AMOUNT: USD 119,981.00
(ONE HUNDRED NINETEEN THOUSAND
NINE HUNDRED EIGHTY ONE
AND 00/100 UNITED STATES
DOLLARS)

WE HEREBY ESTABLISH OUR IRREVOCABLE STANDBY LETTER OF CREDIT NO. P-232687 IN YOUR FAVOR, AT THE REQUEST AND FOR THE ACCOUNT OF THE LIPOSOME COMPANY, 1 RESEARCH WAY, PRINCETON, NJ 08540 UP TO THE AGGREGATE AMOUNT OF ONE HUNDRED AND NINETEEN THOUSAND NINE HUNDRED AND EIGHTY ONE U.S. DOLLARS ($119,981.00). AVAILABLE UPON PRESENTATION OF THE FOLLOWING:

1 - A SIGHT DRAFT, BEARING REFERENCE TO THIS LETTER OF CREDIT NO. P-232687.

2 - BENEFICIARY'S DATED STATEMENT PURPORTEDLY SIGNED BY ONE OF ITS OFFICIALS READING "I CERTIFY THAT THE AMOUNT OF THE DRAFT IS PAYABLE PURSUANT TO REGULATIONS ISSUED UNDER AUTHORITY OF 10 CFR PART 30."

THIS LETTER OF CREDIT IS ISSUED IN ACCORDANCE WITH REGULATIONS ISSUED UNDER THE AUTHORITY OF THE U.S. NUCLEAR REGULATORY COMMISSION (NRC), AN AGENCY OF THE U.S. GOVERNMENT, PURSUANT TO THE ATOMIC ENERGY ACT OF 1954, AS AMENDED, AND THE ENERGY REORGANIZATION ACT OF 1974. THE NRC HAS PROMULGATED REGULATIONS IN TITLE 10, CHAPTER 1 OF THE CODE OF FEDERAL REGULATIONS, PART 30, WHICH REQUIRE THAT A HOLDER OF, OR APPLICANT FOR, A LICENSE ISSUED UNDER 10 CFR PART 30 PROVIDE ASSURANCE THAT FUNDS WILL BE AVAILABLE WHEN NEEDED FOR DECOMMISSIONING.

THIS LETTER OF CREDIT IS EFFECTIVE IMMEDIATELY AND SHALL EXPIRE ON JULY 15, 1995, BUT SUCH EXPIRATION DATE SHALL BE AUTOMATICALLY EXTENDED FOR A PERIOD OF AT LEAST ONE YEAR ..... AND ON EACH SUCCESSIVE EXPIRATION DATE, UNLESS, AT LEAST 90 DAYS BEFORE THE CURRENT EXPIRATION DATE, WE NOTIFY YOU AND THE LIPOSOME COMPANY, BY CERTIFIED MAIL, AS SHOWN ON THE SIGNED RETURN RECEIPTS, IF THE LIPOSOME COMPANY IS UNABLE TO SECURE ALTERNATIVE FINANCIAL ASSURANCE TO REPLACE THIS LETTER OF CREDIT WITHIN 30 DAYS OF NOTIFICATION OF CANCELLATION THE NRC MAY DRAW UPON THE FULL VALUE OF THIS LETTER OF CREDIT PRIOR TO CANCELLATION. THE BANK SHALL GIVE IMMEDIATE NOTICE TO

-CONTINUED-

Authorized Signature
Daniel J. Cieiski, S.V.P.
Chemical Bank New Jersey

P-232687- -001-L1-01-02-01

Provisions applicable to this credit
This credit is subject to the Uniform Customs and Practice for Documentary Credits (1993 Revision) International Chamber of Commerce Publication No. 500

OFFICIAL RECORD COPY

ML 10

114548

JUL 19 1994

CHEMICAL

Chemical Bank New Jersey NA
International Division
334 Madison Avenue
Morristown, NJ 07960

ISSUE DATE: JULY 15, 1994
L/C NO.: P-232687

Advising Bank

********** DIRECT **********

APPLICANT:
THE LIPOSOME COMPANY INC.
ONE REARCH WAY
PRINCETON, N.J. 08540

MAIL TO

Beneficiary

U.S. NUCLEAR REGULATORY COMMISSION
REGION 1: 475 ALLENDALE ROAD
KING OF PRUSSIA, PA 19406-1415

AMOUNT: USD 119,981.00
(ONE HUNDRED NINETEEN THOUSAND
NINE HUNDRED EIGHTY ONE
AND 00/100 UNITED STATES
DOLLARS)

THE APPLICANT AND THE NRC OF ANY NOTICE RECEIVED OR ACTION FILED ALLEGING (1) THE INSOLVENCY OR BANKRUPTCY OF THE FINANCIAL INSTITUTION OR (2) ANY VIOLATIONS OF REGULATORY REQUIREMENTS THAT COULD RESULT IN THE SUSPENSION OR REVOCATION OF THE BANK'S CHARTER OR LICENSE TO DO BUSINESS. THE FINANCIAL INSTITUTION ALSO SHALL GIVE IMMEDIATE NOTICE IF THE BANK, FOR ANY REASON, BECOMES UNABLE TO FULFILL ITS OBLIGATION UNDER THE LETTER OF CREDIT.

WHENEVER THIS LETTER OF CREDIT IS DRAWN ON UNDER AND IN COMPLIANCE WITH THE TERMS OF THIS LETTER OF CREDIT, WE SHALL DULY HONOR SUCH DRAFT UPON ITS PRESENTATION TO US WITHIN 30 DAYS, AND WE SHALL DEPOSIT THE AMOUNT OF THE DRAFT DIRECTLY INTO THE STANDBY TRUST FUND OF THE LIPOSOME COMPANY IN ACCORDANCE WITH YOUR INSTRUCTIONS.

EACH DRAFT MUST BEAR ON ITS FACE THE CLAUSE: "DRAWN UNDER LETTER OF CREDIT NO. P-232687 DATED JULY 15, 1994, AND THE TOTAL OF THIS DRAFT AND ALL OTHER DRAFTS PREVIOUSLY DRAWN UNDER THIS LETTER OF CREDIT DOES NOT EXCEED $119,981.00

THIS CREDIT IS SUBJECT TO THE UNIFORM CUSTOMS AND PRACTICE FOR DOCUMENTARY CREDITS, 1993 REVISION, ICC PUBLICATION NO. 500.

THE PRE-PRINTED WORDING APPEARING ON THIS ADVICE REFERENCING ICC PUBLICATION NO. 400 IS HEREBY DELETED.

Daniel J. Gralski, S.V.P.
Chemical Bank New Jersey

Authorized Signature

P-232687- -001-L1-01-02-01

Provisions applicable to this credit
This credit is subject to the Uniform Customs and Practice for Documentary Credits (1983 Revision) International Chamber of Commerce Publication No. 400

STICK POSTAGE STAMPS TO ARTICLE TO COVER FIRST CLASS POSTAGE, CERTIFIED MAIL FEE, AND CHARGES FOR ANY SELECTED OPTIONAL SERVICES. (See front)

1. If you want this receipt postmarked, stick the gummed stub to the right of the return address leaving the receipt attached and present the article at a post office service window or hand it to your rural carrier (no extra charge)

2. If you do not want this receipt postmarked, stick the gummed stub to the right of the return address of the article, date, detach and retain the receipt, and mail the article.

3. If you want a return receipt, write the certified mail number and your name and address on a return receipt card, Form 3811, and attach it to the front of the article by means of the gummed ends if space permits. Otherwise, affix to back of article. Endorse front of article **RETURN RECEIPT REQUESTED** adjacent to the number.

4. If you want delivery restricted to the addressee, or to an authorized agent of the addressee, endorse **RESTRICTED DELIVERY** on the front of the article.

5. Enter fees for the services requested in the appropriate spaces on the front of this receipt. If return receipt is requested, check the applicable blocks in item 1 of Form 3811.

6. Save this receipt and present it if you make inquiry.

U.S.G.P.O. 1989-234-[illegible]

P 495 446 286

RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED
NOT FOR INTERNATIONAL MAIL

(See Reverse)

Sent to The Liposome Company, Incorporated ATTN: Lee Buccheri Radiation Safety Officer Princeton Forrestal Center 1 Research Way Princeton, New Jersey 08540	
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt showing to whom and Date Delivered	
Return Receipt showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	$
Postmark or Date	

PS Form 3800, June 1985 U.S.G.P.O. 1989-234-555

MAY 25 1994

License No: 29-19918-01
Docket No: 030-19526
Control No: 114548

The Liposome Company, Incorporated
ATTN: Lee Buccheri
Radiation Safety Officer
Princeton Forrrestal Center
1 Research Way
Princeton, New Jersey 08540

Dear Ms. Buccheri:

SUBJECT: FINANCIAL ASSURANCE, DEMAND FOR INFORMATION

Our records show that as of July 27, 1990, you were required to comply with 10 CFR 30.35. 10 CFR 30.35 requires that licensees, authorized to possess amounts of licensed material listed in the above referenced license, submit a decommissioning funding plan and/or a certificate of financial assurance for decommissioning. The NRC received your initial response to this requirement, however, you have failed to respond to the deficiency letter dated March 15, 1994 (copy enclosed) within the required time period. You, therefore, appear to be in violation of this requirement.

The Commission considers noncompliance with 10 CFR 30.35 to be a significant regulatory concern because of the importance of assuring that licensees, and not the public, pay for decommissioning of licensed facilities. To determine whether your license should be modified, suspended or revoked, or whether other enforcement action is appropriate, you are required to respond in writing, and under oath or affirmation, and within 30 days of the date of this letter with the information described in the enclosed Demand for Information.

Your response should be addressed to Region I at the above address and should be clearly marked, "Response to Demand for Information."

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

OFFICIAL RECORD COPY - C:\DOC\DECOMM\LIPOSOME.DFI - 05/18/94

RETURN ORIGINAL TO REGION I

The responses directed by this letter and the enclosed Demand for Information are not subject to the clearance procedures of the Office of Management and Budget as required by the Paperwork Reduction Act of 1980, PL 96-511.

If you have any questions concerning this Demand, please contact David Everhart at (610) 337-6936.

Sincerely,

Original Signed By:
Ronald R. Bellamy

Ronald R. Bellamy, Chief
Nuclear Materials Safety Branch
Division of Radiation Safety
and Safeguards

Enclosures:
1. Demand for Information
2. Letter dated March 15, 1994

cc: w/Enclosure 1
Public Document Room (PDR)
Nuclear Safety Information Center (NSIC)
State of New Jersey

bcc:
Regiion I Docket Room (PDR)
D. Everhart, RI
M. Shanbaky, RI
D. Holody, RI

DRSS:RI	DRSS:RI	DRSS:RI	DRSS:RI
Everhart	Shanbaky	Bellamy	Hehl
05/18/94	05/18/94	05/18/94	05/19/94

UNITED STATES
NUCLEAR REGULATORY COMMISSION

In the matter of	)	Docket No. 030-19526
The Liposome Company, Incorporated	)	License No. 29-19918-01
Princeton, New Jersey	)	

DEMAND FOR INFORMATION

I

The Liposome Company, Incorporated holds NRC License No. 29-19918-01 (the License), issued by the Nuclear Regulatory Commission (the NRC or Commission) pursuant to 10 CFR 30, 40 or 70. The license authorizes the licensee to use and possess byproduct material in accordance with the terms and conditions specified therein and the a plicable NRC regulations.

II

As of July 27, 1990, the Licensee was required to comply with 10 CFR 30.35 of the Commission's regulations, which requires licensees authorized to possess certain quantities of licensed material to submit either a decommissioning funding plan and/or a certification of financial assurance for decommissioning in the amount prescribed in 10 CFR 30.35, in accordance with the criteria set forth in that section. The License authorizes such quantities and the NRC staff has not yet received the Licensee's complete response to this requirement. Therefore, the Licensee appears to be in violation of this requirement.

The violation of the requirements of 10 CFR 30.35 is a significant regulatory concern to the NRC staff. Therefore, further information is needed to determine whether the Commission can have reasonable assurance that the Licensee will satisfy the requirements of 10 CFR 30.35 and otherwise conduct its activities in accordance with the Commission's requirements.

III

Accordingly, pursuant to sections 161c, 161o, 182, and 186 of the Atomic Energy Act of 1954, as amended, and 10 CFR 30.32(b), in order for the Commission to determine whether the license should be modif ed, suspended, or revoked or other enforcement action taken to ensure compliance with NRC regulatory requirements, the Licensee is required to submit to the Administrator, Region I, 475 Allendale Road, King of Prussia, Pennsylvania 19406, within 30 days of the date of this Demand for Information, the information requested in the letter dated March 15, 1994, in writing and under oath or affirmation.

OFFICIAL RECORD COPY

RETURN ORIGINAL TO
REGION 1

After reviewing your response, the NRC will determine whether further action is necessary to ensure compliance with regulatory requirements.

FOR THE NUCLEAR REGULATORY COMMISSION

Original Signed By:
Mohamed M. Shanbaky

NUCLEAR MATERIALS SAFETY BRANCH
REGION I
KING OF PRUSSIA, PENNSYLVANIA 19406

Dated at King of Prussia, Pennsylvania
this 25th day of May , 1994

MAR 1 5 1994

License No. 29-19918-01
Docket No. 030-19526
Control No. 114548

The Liposome Company, Incorporated
ATTN: Lee Buccheri
Radiation Safety Officer
Princeton Forrestal Center
1 Research Way
Princeton, New Jersey 08540

Dear Mr. Buccheri:

Subject: Financial Assurance

This is in reference to your letter dated March 18, 1991 with attached Decommissioning Funding Plan to provide financial assurance for License No. 29-19918-01. We have reviewed your submittal and request that you modify your submission to address the specific matters described below:

1. You have adapted the cost estimating tables found in Appendix F to *Regulatory Guide 3.66, "Standard Format and Content of Financial Assurance Mechanisms Required for Decommissioning Under 10 CFR Parts 30, 40, 70 and 72*, to derive the submitted cost estimate. You have not, however, substantiated the assumption in your cost estimate regarding the low levels of contamination in the facility. According to the cost estimate, the only items which may require decontamination during decommissioning are refrigerators, some sinks and drains, a liquid scintillation counter, centrifuges, fume hoods and laboratory benches. The cost estimate indicates that no other equipment or building surfaces in any of the 18 laboratories and associated rooms will require decontamination and decommissioning. The Decommissioning Funding Plans (DFP) states that this is due to the fact that: there is "minimal contamination of equipment and none to the facility"; "based on the history of the site ... there seems (to be) little reason to expect any major contamination of the facility"; and "monthly radiation surveys indicate no contamination of the facility."

   Please substantiate these claims of minimal contamination to the facility.

   a. Describe the extent of the monthly surveys (instrumentation and degree of inclusion, overview versus in-depth survey) and state whether or not the sanitary sewer is included in the survey.

SECTION COPY

b. Describe whether your assumption that there are no sewer disposals is based on tracking and recording of all disposal actions or on the assumption that the policy of not disposing radioactive material (RAM) in the sanitary sewer is followed consistently.

c. Describe the extent of the preliminary surveys of the ductwork, ie. were all the ducts surveyed or was a representative sample chosen. If a representative sample was chosen, what percentage was selected as a representative sample.

You may further substantiate the assumption that there is routinely lower contamination found at the facility by presenting results of wipe tests, both average and maximum, and confirm that areas of increased potential for contamination, such as glove boxes, fume hoods, duct-work, laboratory benches and floors have low levels of contamination.

2. You provided estimates of volumes of equipment that may require decontamination and decommissioning, however, the number and types of components are not clear. Specifically, the estimates for fume hoods, laboratory benches and sinks and drains are expressed in volume without a clear indication of the actual number of units included in the cost estimate. We could not evaluate whether the cost estimate includes reasonable estimates of costs for decommissioning activities. Provide additional detail in Table 3 which clarifies the unit volume and number of units of contaminated equipment to allow the NRC to evaluate the cost estimate for major decommissioning activities.

3. It appears that you have not made any allowance in the cost estimate for contingencies. Regulatory Guide 3.66 recommends that a contingency factor be included in the decommissioning cost estimate. Incorporating a contingency factor in the cost estimate will help to ensure that you are prepared for unexpected circumstances that could raise decommissioning costs. *NUREG\CR-1754, "Technology, Safety and Costs of Decommissioning Reference Non-Fuel-Cycle Nuclear Facilities"* (enclosed) uses a contingency factor of 25 percent in its cost estimates for each of six reference laboratories. Please incorporate a contingency factor of 25 percent into the decommissioning cost estimate or you may choose to use a lower contingency factor if you can show why a lower factor is appropriate. In addition, confirm that you have not included in the cost estimate, credit for any salvage value that may be realized with the sale of potential assets after decommissioning.

4. 10 CFR 30.35(e) requires that you describe the means you will use to adjust decommissioning cost estimates and associated funding levels over the life of the facility. Regulatory Guide 3.66 provides a method for adjusting the cost estimates and suggests that adjustments be made for inflation and for site-specific factors at the time of license renewal, or when the amounts or types of material at the facility change. You may also need to make adjustments to account for inflation, for other changes in prices of goods and services, for changes in facility conditions, or for changes in expected

decommissioning procedures. Please provide the means you will use for adjusting your decommissioning funding levels.

5. You submitted a Letter of Credit which closely follows the recommended wording in Regulatory Guide 3.66, however, it is an unexecuted draft and does not provide financial assurance in its present form. An acceptable Letter of Credit must specify a financial institution which is authorized to issue a Letter of Credit and which is regulated by a state or federal agency. The Letter of Credit must also include: a letter of credit number; an effective date; an expiration date; and must be signed by an authorized representative of the issuing financial institution. Submit an originally signed duplicate (an executed copy) of the Letter of Credit as required by 10 CFR 30.35 and as recommended by Regulatory Guide 3.66.

6. 10CFR 30.35(f)(2)(ii) requires licensees using a surety method of financial assurance certification to make the financial assurance mechanism payable to a trust fund established for decommissioning costs since funds paid directly to NRC must be deposited in the U.S. Treasury and would not be available for decommissioning costs. To avoid the possibility that a trust fund will not be readily available if and when needed, Regulatory Guide 3.66 states that a standby trust fund should be established and submitted with the Letter of Credit. Please submit the standby trust fund, acknowledgement, and related documents and closely follow the recommended wording found on pages 4-18 through 4-27 of Regulatory Guide 3.66.

We will continue our review upon receipt of this information. Please reply in duplicate to my attention at the Region I office and refer to Mail Control No. 114548. If you have any technical questions regarding this deficiency letter please call David Everhart at (215) 337-6936.

If we do not receive a reply from you within 30 calendar days from the date of this letter, we shall assume that you do not wish to pursue your application.

Sincerely,

Original Signed By:
Mohamed M. Shanbaky

Mohamed M. Shanbaky, Chief
Research and Development Section
Division of Radiation Safety
and Safeguards

Enclosures:
1. Regulatory Guide 3.66
2. NUREG\CR-1754
3. NUREG\CR-1754, Addendum 1

THE LIPOSOME COMPANY, INC.

May 6, 1994

Mr. David Everhart
NRC
Region 1
475 Allendale Road
King of Prussia, PA 19406-1415

Mail Control No. 114548
License No. 29-19918-01

Dear David:

In response to the deficiency letter dated March 15, 1994, I am requesting an extension of 30 days from receipt of this letter.

As you know, Teledyne Isotopes has been contracted to assist us in preparing the Decommissioning Plan. We are currently reviewing the complete document and addressing the matters described in the deficiency letter.

I appreciate your help and if you have any questions, please call me at (609)452-7061.

Sincerely,

Lee Buccheri
Manager
Occupational Health & Safety

LB/md
Enclosure

114548

OFFICIAL RECORD COPY MAIL 10 MAY 11 1994

One Research Way Princeton Forrestal Center Princeton, New Jersey 08540-6619 (609) 452-7061 Telefax: (609) 452-1890

MAR 15 1994

License No. 29-19918-01
Docket No. 030-19526
Control No. 114548

The Liposome Company, Incorporated
ATTN: Lee Buccheri
Radiation Safety Officer
Princeton Forrestal Center
1 Research Way
Princeton, New Jersey 08540

Dear Mr. Buccheri:

Subject: Financial Assurance

This is in reference to your letter dated March 18, 1991 with attached Decommissioning Funding Plan to provide financial assurance for License No. 29-19918-01. We have reviewed your submittal and request that you modify your submission to address the specific matters described below:

1. You have adapted the cost estimating tables found in Appendix F to *Regulatory Guide 3.66, "Standard Format and Content of Financial Assurance Mechanisms Required for Decommissioning Under 10 CFR Parts 30, 40, 70 and 72*, to derive the submitted cost estimate. You have not, however, substantiated the assumption in your cost estimate regarding the low levels of contamination in the facility. According to the cost estimate, the only items which may require decontamination during decommissioning are refrigerators, some sinks and drains, a liquid scintillation counter, centrifuges, fume hoods and laboratory benches. The cost estimate indicates that no other equipment or building surfaces in any of the 18 laboratories and associated rooms will require decontamination and decommissioning. The Decommissioning Funding Plans (DFP) states that this is due to the fact that: there is "minimal contamination of equipment and none to the facility"; "based on the history of the site ... there seems (to be) little reason to expect any major contamination of the facility"; and "monthly radiation surveys indicate no contamination of the facility."

   Please substantiate these claims of minimal contamination to the facility.

a. Describe the extent of the monthly surveys (instrumentation and degree of inclusion, overview versus in-depth survey) and state whether or not the sanitary sewer is included in the survey.

b. Describe whether your assumption that there are no sewer disposals is based on tracking and recording of all disposal actions or on the assumption that the policy of not disposing radioactive material (RAM) in the sanitary sewer is followed consistently.

c. Describe the extent of the preliminary surveys of the ductwork, ie. were all the ducts surveyed or was a representative sample chosen. If a representative sample was chosen, what percentage was selected as a representative sample.

You may further substantiate the assumption that there is routinely lower contamination found at the facility by presenting results of wipe tests, both average and maximum, and confirm that areas of increased potential for contamination, such as glove boxes, fume hoods, duct-work, laboratory benches and floors have low levels of contamination.

2. You provided estimates of volumes of equipment that may require decontamination and decommissioning, however, the number and types of components are not clear. Specifically, the estimates for fume hoods, laboratory benches and sinks and drains are expressed in volume without a clear indication of the actual number of units included in the cost estimate. We could not evaluate whether the cost estimate includes reasonable estimates of costs for decommissioning activities. Provide additional detail in Table 3 which clarifies the unit volume and number of units of contaminated equipment to allow the NRC to evaluate the cost estimate for major decommissioning activities.

3. It appears that you have not made any allowance in the cost estimate for contingencies. Regulatory Guide 3.66 recommends that a contingency factor be included in the decommissioning cost estimate. Incorporating a contingency factor in the cost estimate will help to ensure that you are prepared for unexpected circumstances that could raise decommissioning costs. *NUREG\CR-1754, "Technology, Safety and Costs of Decommissioning Reference Non-Fuel-Cycle Nuclear Facilities"* (enclosed) uses a contingency factor of 25 percent in its cost estimates for each of six reference laboratories. Please incorporate a contingency factor of 25 percent into the decommissioning cost estimate or you may choose to use a lower contingency factor if you can show why a lower factor is appropriate. In addition, confirm that you have not included in the cost estimate, credit for any salvage value that may be realized with the sale of potential assets after decommissioning.

4. 10 CFR 30.35(e) requires that you describe the means you will use to adjust decommissioning cost estimates and associated funding levels over the life of the facility.

Regulatory Guide 3.66 provides a method for adjusting the cost estimates and suggests that adjustments be made for inflation and for site-specific factors at the time of license renewal, or when the amounts or types of material at the facility change. You may also need to make adjustments to account for inflation, for other changes in prices of goods and services, for changes in facility conditions, or for changes in expected decommissioning procedures. Please provide the means you will use for adjusting your decommissioning funding levels.

5. You submitted a Letter of Credit which closely follows the recommended wording in Regulatory Guide 3.66, however, it is an unexecuted draft and does not provide financial assurance in its present form. An acceptable Letter of Credit must specify a financial institution which is authorized to issue a Letter of Credit and which is regulated by a state or federal agency. The Letter of Credit must also include: a letter of credit number; an effective date; an expiration date; and must be signed by an authorized representative of the issuing financial institution. Submit an originally signed duplicate (an executed copy) of the Letter of Credit as required by 10 CFR 30.35 and as recommended by Regulatory Guide 3.66.

6. 10CFR 30.35(f)(2)(ii) requires licensees using a surety method of financial assurance certification to make the financial assurance mechanism payable to a trust fund established for decommissioning costs since funds paid directly to NRC must be deposited in the U.S. Treasury and would not be available for decommissioning costs. To avoid the possibility that a trust fund will not be readily available if and when needed, Regulatory Guide 3.66 states that a standby trust fund should be established and submitted with the Letter of Credit. Please submit the standby trust fund, acknowledgement, and related documents and closely follow the recommended wording found on pages 4-18 through 4-27 of Regulatory Guide 3.66.

We will continue our review upon receipt of this information. Please reply in duplicate to my attention at the Region I office and refer to Mail Control No. 114548. If you have any technical questions regarding this deficiency letter please call David Everhart at (215) 337-6936.

If we do not receive a reply from you within 30 calendar days from the date of this letter, we shall assume that you do not wish to pursue your application.

Sincerely,

Original Signed By:
Mohamed M. Shanbaky

Mohamed M. Shanbaky, Chief
Research and Development Section
Division of Radiation Safety
and Safeguards

Enclosures:
1. Regulatory Guide 3.66
2. NUREG\CR-1754
3. NUREG\CR-1754, Addendum 1

bcc:
M. Shanbaky, RI
D. Everhart, RI

DRSS:RI
Everhart
1/31/94

DRSS:RI
Shanbaky
1/7/94

MS 20
K-2

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

MEMORANDUM FOR: Anthony Dimitriadis
Nuclear Materials Safety Branch
Division of Radiation Safety
and Safeguards, Region I

JAN 06 1994

FROM: Louis M. Bykoski
Decommissioning and
Regulatory Issues Branch
Division of Low-Level Waste Management
and Decommissioning
Office of Nuclear Material Safety
and Safeguards

SUBJECT: THE OFFICE OF THE GENERAL COUNSEL AND CONTRACTOR COMMENTS ON NONSTANDARD FINANCIAL ASSURANCE SUBMITTALS

Our contractor, ICF Incorporated, and the Office of the General Counsel (OGC) have reviewed and provided comments on the Liposome Company nonstandard financial assurance submittal sent to us for review.

The ICF comments are presented in two parts. The first part deals with specific recommendations to current deficiencies. The second part (Other Issues) provides a discussion of changes to the standard wording that are acceptable and are not considered to be deficiencies. The OGC comments include additional deficiencies that need to be corrected by the licensee and comments for our internal use.

You should carefully review the comments before preparing the deficiency letter. We have enclosed more specific information to help you sort and consolidate the ICF and OGC comments.

Should you have any further questions with regard to the comments, please call me on (301) 504-2572 or David Futoma of OGC on (301) 504-1621.

Louis M. Bykoski

Louis M. Bykoski
Decommissioning and
Regulatory Issues Branch
Division of Low-Level Waste Management
and Decommissioning
Office of Nuclear Material Safety
and Safeguards

Enclosure: As stated

OFFICIAL RECORD COPY ML 10

114548
RECD IN LAS 1/11/94

MAR 0 6 1994

LIST OF INSTRUCTIONS

LIPOSOME COMPANY

In reviewing the comments the reviewer will note that there will be some overlap between ICF and OGC comments. The following comments should be included in the basis for the deficiency letter:

1. ICF comments 1 through 8 plus last paragraph.

2. All OGC comments.

All other comments and discussions are for reviewer information.

MEMO TO: Louis M. Bykoski, NMSS

FROM: OGC

RE: REVIEW OF NONSTANDARD SUBMITTALS

JAN 06 1994

Liposome Co.: No legal objection to all ICF recommendations.

9300 Lee Highway
Fairfax, Virginia
22031-1207

703/934-3000

ICF INCORPORATED

November 22, 1993

To: Dr. Lou Bykoski, NMSS/NRC

From: Tom Ciaglo, Martin Marchaterre, and Craig Dean, ICF Incorporated

Subject: Review of Decommissioning Funding Plan and Letter of Credit Submitted by The Liposome Company

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The Liposome Company in Princeton, New Jersey, submitted a decommissioning funding plan, using a letter of credit, in the amount of $28,500. The submission assures decommissioning costs for license 29-19918-01 issued under 10 CFR Part 30. Upon review of the submission, ICF recommends that NRC Region I require the licensee to modify the submission in the following ways:

(1) Substantiate the assumption regarding the extent of contamination at the facility;

(2) Clarify the volumes of equipment requiring decontamination and decommissioning;

(3) Submit additional detail to support the estimated number of person-days required for planning and preparation and performing a final radiation survey (NUREG/CR-1754, Addendum 1, Appendix B);

(4) Describe the means to be used for adjusting cost estimate and associated funding level over the life of the facility (10 CFR 30.35(e));

(5) Clarify that no credit was taken for salvage value (*Regulatory Guide 3.66*, page 1-10);

(6) Incorporate a contingency factor into the total decommissioning cost estimate (NUREG/CR-1754, Addendum 1);

(7) Submit an executed copy of the letter of credit (10 CFR Part 30.35); and

(8) Submit a standby trust agreement (10 CFR 30.35(f)(2)(ii)).

These recommendations and other issues are discussed below.

(1) **Substantiate the Assumption Regarding the Extent of Contamination at the Facility**

The licensee adapted the cost estimating tables in Appendix F of *Regulatory Guide 3.66* "Standard Format and Content of Financial Assurance Mechanisms Required for Decommissioning Under 10 CFR Parts 30, 40, 70, and 72," June 1990 to derive its cost estimate. However, the licensee has not adequately substantiated the assumption in its cost estimate regarding the low levels of contamination at the facility.[1] According to the licensee's cost estimate, the only items that will require decontamination and decommissioning are refrigerators, some sinks and drains, a liquid scintillation counter, centrifuges, fume hoods, and laboratory benches. The cost estimate indicates that no other equipment and no building surfaces in any of the licensee's 18 laboratories and associated rooms will require decontamination and decommissioning.[2]

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[1] ICF assumes that the licensee will not need to restore contaminated areas on facility grounds, stabilize the site, or perform long-term surveillance to properly decommission its facility because the licensee did not identify the need to conduct such activities in its decommissioning funding plan.

[2] The licensee's cost estimate states in three places its assumption that other parts of the facility will not be found to be contaminated:

- "Monthly radiation surveys as of the date of this plan indicate minimal contamination of equipment and none to the facility. Radioisotopes are not disposed to the sanitary sewer and volatile compounds have only been used once. Given the history of the facility, it is reasonable to assume that few, if any, difficulties will arise during the decommissioning activities." (Cost Estimate §2.1.2)

- "Based on the history of the site as described above, there seems little reason to expect any major contamination of the facility." (Cost Estimate §2.1.3)

- "As previously stated, monthly radiation surveys indicate no contamination of the facility and the only item found with fixed contamination was one laboratory scale. Most work with radioisotopes is conducted in lined trays to prevent contamination of the bench tops. Animals used in radioisotope studies are segregated from other animals. To date, there has been one spill of radioactive material. Several milliliters of a labeled solution was spilled and promptly cleaned. Liquid radioactive material is not disposed to the sanitary sewer, it is adsorbed and shipped for land disposal at an approved facility. Preliminary surveys indicated that the hood ductwork is not contaminated and will not require action under this plan. There have been no modifications to the facility to suspect the covering of radioactive contamination." (Cost Estimate §3.1)

The licensee, however, has not adequately substantiated these claims as to the minimal contamination of its facility. The extent of the monthly radiation surveys, for example, is not described, nor is it clear if the sanitary sewer is included in the surveys. The licensee has not explained whether its assertion that there has been no disposal to the sanitary sewer is based on tracking and recording of all disposal actions, or only on an assumption that its policy of not disposing into drains was followed consistently. The extent of the preliminary surveys of the ductwork also is not described -- were all ducts surveyed or was a representative sample selected? ICF recommends that NRC require additional information about the current level of contamination at the facility. In addition to further explaining the basis for its assumptions, the licensee could present results from wipe tests to test for any contamination present at the facility and to prove that areas with more frequent contact with radionuclides (such as glove boxes, fume hoods, duct-work, lab benches, floors, etc.) have low levels of contamination. Alternatively, the licensee could increase its cost estimate to include decommissioning of items that may have elevated levels of contamination at the time of decommissioning.

(2) Clarify the Volumes of Equipment Requiring Decontamination and Decommissioning

Although the licensee provided, in Table 3 of its cost estimate, estimates of the volumes of equipment that will require decontamination and decommissioning, the units and the number of components involved are not clear. In particular, the estimates for fume hoods, lab benches, and sink and drains apparently are expressed in terms of volume without a clear indication of the number of such items included in the cost estimate. Therefore, ICF could not evaluate whether the licensee's estimated costs include reasonable costs for decommissioning activities. ICF recommends that NRC require the licensee to provide additional detail in Table 3 of its cost estimate that clarifies the unit volumes and number of units of contaminated equipment to allow NRC to evaluate whether the licensee has provided reasonable cost estimates for all major decommissioning activities.

(3) Submit Additional Detail to Support Estimated Number of Person-Days Required for Planning and Preparation and Performing a Final Radiation Survey (NUREG/CR-1754, Addendum 1, Appendix B)

The licensee estimates that it will require 124 work hours, or 15.5 person-days, for planning and preparation (described as updating the decommissioning plan and charactering the radiological condition of the facility) and 40 work hours, or 5 person-days, to perform a final radiation survey for decommissioning. (Cost Estimate, Table 1) In contrast, NUREG/CR-1754, Addendum 1, estimates that it would require an average of more than 60 person-days for planning and preparation and 20 person-days for a final radiation survey at each of six reference laboratories for decommissioning.[3]

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[3] NUREG/CR-1754, Addendum 1, Technology, Safety and Costs of Decommissioning Reference Non-Fuel-Cycle Nuclear Facilities: Compendium of Current Information, Pacific Northwest Laboratory, October 1989, Appendix B.

Because the licensee's facility is larger than the six reference facilities, ICF recommends that NRC require the licensee to revise its estimate or provide further detail to support its current estimate of the number of person-days required for planning and preparation and for a final radiation survey.

(4) Describe the Means to be Used for Adjusting the Cost Estimate and Associated Funding Level Over the Life of the Facility (10 CFR 30.35(e))

10 CFR 30.35(e) requires a licensee to describe the means it will use to adjust its decommissioning cost estimate and associated funding level over the life of its facility. The licensee does not provide such a description in its decommissioning funding plan. ICF recommends that the licensee use the method described in *Regulatory Guide 3.66* for adjusting cost estimates. *Regulatory Guide 3.66* suggests that cost estimates be updated with current prices for goods and services at the time of license renewal or when the amounts/types of material at the facility change. Adjustments should be made to account for inflation, for other changes in prices of goods and services, for changes in facility conditions, and for changes in expected decommissioning procedures.

(5) Clarify that No Credit Was Taken for Salvage Value (*Regulatory Guide 3.66*, page 1-10)

The cost estimate does not state whether credit has been taken for any salvage value that may be realized with the sale of potential assets after decommissioning. If estimated credits are taken for salvage value but are not fully realized at the time of decommissioning, the cost estimate may be significantly low. To ensure the adequacy of the cost estimate, *Regulatory Guide 3.66*, page 1-10, states that cost estimates should not incorporate any credit for salvage value. ICF recommends that NRC require the licensee to clarify that it has not included in its cost estimate credit for any salvage value that may be realized with the sale of potential assets after decommissioning.

(6) Incorporate a Contingency Factor into the Total Decommissioning Cost Estimate (NUREG/CR-1754, Addendum 1)

The licensee has not explicitly made any allowance in its cost estimate for contingencies. *Regulatory Guide 3.66* recommends that a contingency factor be included in the decommissioning cost estimate. Incorporating a contingency factor in cost estimates helps ensure coverage for unexpected circumstances that could raise decommissioning costs. NUREG/CR-1754 uses a contingency factor of 25 percent in its cost estimates for each of six reference laboratories.[4] To ensure that the licensee's cost estimate provides an adequate amount for unanticipated costs, ICF recommends that NRC require the licensee to revise its estimate to explicitly incorporate a contingency factor of at least 25 percent into its decommissioning cost estimate.

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[4] NUREG/CR-1754, Addendum 1, Technology, Safety and Costs of Decommissioning Reference Non-Fuel-Cycle Nuclear Facilities: Compendium of Current Information, Pacific Northwest Laboratory, October 1989.

(7) **Submit an Executed Copy of the Letter of Credit (10 CFR Part 30.35)**

Although the submitted letter of credit follows the recommended wording in *Regulatory Guide 3.66* almost exactly, it is an unexecuted draft and does not provide any financial assurance in its present form. In order to be effective, the letter of credit must specify a financial institution that is authorized to issue a letter of credit and is regulated by a state or federal agency. In addition, the letter of credit must include the letter of credit number, an effective date, an expiration date, and must be signed by an authorized representative of the issuing financial institution. ICF recommends that NRC require the licensee to execute the letter of credit as required by 10 CFR 30.35, and to submit an originally signed duplicate to NRC as recommended in *Regulatory Guide 3.66* on page 3-20.

(8) **Submit a Standby Trust Agreement (10 CFR 30.35(f)(2)(ii))**

Under 10 CFR 30.35(f)(2)(ii), a surety method of assurance, such as a letter of credit, "must be payable to a trust established for decommissioning costs." The submitted letter of credit requires that funds withdrawn under the letter of credit must be deposited into a standby trust fund. Because it may not be possible to establish a trust fund at the time the letter of credit is drawn upon (e.g., if the licensee no longer exists), the standby trust should be established at the same time as the letter of credit initially is set up. No standby trust agreement, however, was included in the submission. ICF recommends that NRC require the licensee to submit a standby trust agreement and related documents, as recommended in *Regulatory Guide 3.66*, pages 4-18 through 4-27.

Other Issues

The Region should ensure that documents submitted by the licensee are originally signed duplicates, as recommended in *Regulatory Guide 3.66*. Unless the documents have been properly signed, NRC cannot be certain that the financial assurance mechanism is enforceable.

attachments

10/15/93

REVIEW OF DECOMMISSIONING FUNDING PLAN (DFP)

Name of company or institution: LIPOSOME

Number of licenses and applicable regulations:

X	10 CFR Part 30
	10 CFR Part 40
	10 CFR Part 70
	10 CFR Part 72

NRC LICENSE #:
29-19918-01

Isotopes handled and possession limits (specify units):

^{3}H	^{65}Zn
^{59}Fe	
^{14}C	
^{125}I	
^{35}S	
^{51}Cr	
^{55}Fe	

Total cost estimate for licenses listed above: $ 29,500.00

General comments on DFP: THIS COST ESTIMATE APPEARS VERY LOW BUT WE CAN'T DETERMINE ~~THAT~~ BECAUSE OF UNCLEAR INFORMATION ON THE VOLUME AND NUMBER OF COMPONENTS REQUIRING DECONTAMINATION.

1

APPENDIX A
CHECKLIST FOR DECOMMISSIONING FINANCIAL ASSURANCE

NAME OF LICENSEE OR APPLICANT

MAILING ADDRESS The Liposome Company
1 Research Way, Princeton Forrestal Center
Princeton N.J. 08540

A. Licensee Part (check one of the following):

✓ Part 30 Licensee or Applicant ____ Part 70 Licensee or Applicant

____ Part 40 Licensee or Applicant ____ Part 72 Licensee or Applicant

B. Check appropriate item in each category (if applicable)

1. 5/1/91 Date of Financial Assurance Submission

2. ____ Public Entity

✓ Private Entity

3. ____ Certification of Financial Assurance

✓ Decommissioning Funding Plan - Letter of Credit for $28,500.00 cost estimate $28,155.

4. (a) ____ Prepayment Option (See Appendix B)
   - ____ Trust Fund
   - ____ Escrow Account
   - ____ Certificate of Deposit
   - ____ Government Fund
   - ____ Deposit of Government Securities

   (b) ✓ Surety/Insurance/Other Guarantee (See Appendix C)
   - ____ Surety bond
   - ✓ Letter of Credit $28,500.00
   - ____ Line of Credit
   - ____ Parent Company Guarantee/Financial Test*

   (c) ____ External Sinking Fund, Sinking Account and Surety/Insurance (See Appendix D)
   - ____ Trust Fund
   - ____ Escrow Account
   - ____ Certificate of Deposit
   - ____ Government Fund
   - ____ Deposit of Government Securities
   - ____ Surety Bond
   - ____ Letter of Credit
   - ____ Line of Credit

   (d) ____ Statement of Intent (public entities only)

*May not be used in combination with any other instrument.

APPENDIX C

CHECKLIST FOR SUBMISSION OF SURETY/INSURANCE/PARENT COMPANY GUARANTEE

A. Check Appropriate Form of Surety/Insurance/Guarantee

___ Surety Bond

✓ Letter of Credit

___ Line of Credit

___ Parent Company Guarantee/Financial Test*

___ Insurance

B. Check Documents Submitted for Surety/Insurance/Guarantee

1. Surety Bond
   - ___ Surety Bond
   - ___ Standby Trust Agreement
   - ___ Acknowledgement

2. Letter of Credit
   - ✓ Letter of Credit - unexecuted draft; no dates, no financial institution etc.
   - ___ Standby Trust Agreement - not included
   - ___ Acknowledgement - not included

3. Line of Credit
   - ___ Verification
   - ___ Standby Trust Agreement
   - ___ Acknowledgement

4. Parent Company Guarantee
   - ___ Letter from Chief Executive Officer of Applicant or Licensee
   - ___ Letter from Chief Financial Officer of Parent Company
   - ___ Financial Test: Alternative [I or II]
   - ___ Auditor's Special Report and Attached Schedule
   - ___ Corporate Guarantee
   - ___ Standby Trust Agreement
   - ___ Acknowledgement

5. Insurance
   - ___ Certificate of Insurance
   - ___ Standby Trust Agreement
   - ___ Acknowledgement

May not be used in combination with any other instrument.

EXHIBIT 3-7

CHECKLIST OF CRITERIA FOR REVIEW OF LETTERS OF CREDIT

NA

- Copy of corporate by-laws or other evidence indicating that parties signing the financial instrument (for the applicant) are authorized to represent the organization in the transaction.

- Evidence that the financial instrument is an originally signed duplicate (e.g., an executed copy of the instrument). not signed

- Evidence that the financial institution is regulated by Federal or State agency (e.g., member of FDIC, Federal Reserve System, etc.). - no institutions

- The instrument must be entitled a letter of credit. ✓

- The letter should be limited in amount. ✓

- The letter of credit must contain a specified expiration date or be written for a definite term. – not included

- The issuer's obligation to pay the beneficiary should arise only upon presentation of a draft or other documents specified in the letter of credit. ✓

- The bank must not be called upon to determine a question of fact or law at issue between the licensee and the Commission or State regulatory agency.

Standard wording

- The licensee should have an unqualified obligation to reimburse the issuer for payments made under the letter of credit.

CHECKLIST FOR REVIEWING DECOMMISSIONING FUNDING PLANS (DFP's)

QUESTIONS	COMMENTS
(1) Does the licensee provide supporting documentation for its cost estimates? X Yes ___ No	
(2) Does the licensee use the Appendix F "Cost Estimating Tables?" X Yes ___ No	THE LICENSEE ADAPTED THE COST ESTIMATING TABLES FOR ITS OWN USE; HOWEVER, THEY ARE NOT AS COMPREHENSIVE AS THE TABLES IN APPENDIX F.
(3) Does the cost estimate include the following major cost elements?	
(i) Planning and Preparation? X Yes ___ No	PLANNING AND PREPARATION COSTS ARE INCLUDED; HOWEVER, THEY APPEAR INCOMPLETE.
(ii) Decontamination and/or Dismantling of Radioactive Facility Components? X Yes ___ No	UNITS OR VOLUMES OF COMPONENTS REQUIRING DECONTAMINATION ARE UNCLEAR.
(iii) Packaging, Shipping, and Disposal of Radioactive Wastes? X Yes ___ No	
(iv) Restoration of Contaminated Areas on Facility Grounds? ___ Yes ___ No X NA	THIS ACTIVITY WILL NOT BE REQUIRED AT THIS SITE.
(v) Final Radiation Survey? X Yes ___ No	INCLUDED, BUT APPEAR TO BE LOW.
(vi) Site Stabilization, Long-Term Surveillance? ___ Yes ___ No X NA	THIS ACTIVITY WILL NOT BE REQUIRED AT THIS SITE.

CHECKLIST FOR REVIEWING DFP's (continued)

QUESTIONS	COMMENTS
(4) Is the total cost estimate reasonable for the type(s) and size(s) of facility licensed? ____ Yes ____ No _X_ Not Sure	BECAUSE THE UNITS OF THE VOLUME AND NUMBER OF FACILITY COMPONENTS REQUIRING DECONTAMINATION ARE NOT CLEAR, IT IS NOT POSSIBLE TO EVALUATE WHETHER THE LICENSEE'S COST ESTIMATE IS REASONABLE.
(5) Are the cost estimates for individual facility activities and/or components reasonable? ____ Yes ____ No _X_ Not Sure	SEE ABOVE

CHECKLIST FOR REVIEWING DFP's (continued)

QUESTIONS	COMMENTS
(6) Do the computations seem correct? X Yes ___ No	
(7) Does the licensee take credit for the potential salvage value of recovered materials or decontaminated equipment? ___ Yes ___ No NOT SURE.	THE LICENSEE DOES NOT MAKE EXPLICIT WHETHER IT DID OR DID NOT TAKE CREDIT FOR SALVAGE VALUE.
(8) Does the licensee include a contingency factor in the cost estimate? ___ Yes X No ~~NOT SURE~~	THE LICENSEE DOES NOT MAKE EXPLICIT WHETHER IT DID OR DID NOT INCLUDE A CONTINGENCY FACTOR IN ITS COST ESTIMATE. ILF THEREFORE ASSUMES THAT IT DID NOT.
(9) Does the licensee provide a description of the methods that will be used to adjust the decommissioning cost estimate periodically over the life of the facility? ___ Yes X No	

TELEPHONE CONVERSATION LOG	DATE: September 9, 1993	
PERSON CALLED: Lou Bykoski	ORGANIZATION: NRC HQ	TELEPHONE NUMBER:
LICENSE NUMBER: 29-19918-01	DOCKET NUMBER: 30-19526	MAIL CONTROL NUMBER: 114548

PERSON CALLING:

David B. Everhart
USNRC Region I
475 Allendale Road
King of Prussia, PA 19406

(215) 337-6936
FAX Numbers
(215) 337-5269 or
(215) 337-5234

SUBJECT: Status of deficiency review.

SUMMARY:

Lou stated that there was no action due to the fact that there was only a partial copy of the licensee submittal. I copied and sent the required licensee information which was in our copy of the licensee documentation. Lou stated that it would take 6-8 weeks to get a response from the NRC contractor. This action was included in the group of actions which was sent in August of 1991.

ACTION REQUIRED TAKEN: Wait for contractor's response

SIGNATURE	DATE:

AUG 02 1991

MEMORANDUM FOR: Louis M. Bykoski, NRC Project Officer
Low Level Waste Management, Low Level Regulatory Branch

FROM: John D. Kinneman, Chief
Nuclear Materials Safety Section B
Division of Radiation Safety
and Safeguards

SUBJECT: NONSTANDARD FINANCIAL ASSURANCE SUBMITTALS RELATED TO THE DECOMMISSIONING RULE

John Austin's August 6, 1990 memorandum set forth a procedure for submitting nonstandard financial assurance submittals to you for review by the NRC contractor. We have also included parent company guarantees and decommissioning funding plans.

Licensee	License No.	Control No.
Textron Defense Systems	SUB-1410	113599
Philips Elmet Division of North American	STB-171	114173
E. R. Squibb & Sons, Inc.	29-00139-02	113770
Liposome Company, Inc.	29-19918-01	114548
Department of the Army	SUB-348	112499
Department of the Army	29-00047-02	112495
Department of the Army	29-00047-06	112496
Department of the Army	29-00047-08	112497
Department of the Army	29-00047-09	112498
Bristol-Myers Squibb Co.	06-27843-02	114227
American Cyanamid Company	29-07694-01	112844

If you or the contractors believe any of these cases should more properly be reviewed by the Region, please return them.

Original Signed By:
John D. Kinneman

John D. Kinneman, Chief
Nuclear Materials Safety Section B
Division of Radiation Safety
and Safeguards

cc:
J. Glenn, NMSS
R. Bellamy, RI

OFFICIAL RECORD COPY FINANCIAL ASSURANCE MEMO/5 - 0001.0.0
07/29/91

ML 10

RI:DRSS
Villar/bj
07/24/91

AD:DRSS
Kennemen/bj
8/1 /91

OFFICIAL RECORD COPY

The Liposome Company, Inc.
Princeton

1 RESEARCH WAY, PRINCETON FORRESTAL CENTER
PRINCETON, NEW JERSEY 08540 TELEX: 882085
(609) 452-7060 TELEFAX: (609) 452-1890

030-19506

March 18, 1991

U.S. Nuclear Regulatory Commission
Region I
Nuclear Materials Safety Section B
475 Allendale Road
King of Prussia, PA 19406

RE: Submission of Decommissioning Funding Plan for U.S. NRC License No. 29-19918-01

Dear Sir or Madam:

Enclosed are two copies of our Decommissioning Funding Plan. Please notify us of any changes or modifications that may be required. Upon approval by the NRC of this plan, we will obtain a Letter of Credit in the amount specified in the Plan as detailed in section 5.0 within 30 days.

Also enclosed is our check in the amount of $120.00 to cover the cost of this licensing action.

If you have any questions, please do not hesitate to contact me.

Sincerely,

Elizabeth Buccheri, Manager
Administrative & Technical Service

EB/cs

Enclosures

RECEIVED
DIVISION OF ACCOUNTING
'91 APR 29 P2:23
U.S. NUCLEAR REG COMMISSION

RECEIVED BY LFMS	
Date	5/1/91
Log	May 1
By	AK
Date Completed	5/1/91

FEE NOT REQUIRED
Per IN 90-38

RECEIVED-REGION 1
'91 MAR 19 P12:53

114548

Rec'd in LFMS

APR 17 1991

OFFICIAL RECORD COPY

ML 10

DECOMMISSIONING FUNDING PLAN

FOR

THE LIPOSOME COMPANY

U.S. NRC LICENSE NO. 29-19918-01

PREPARED BY

TELEDYNE ISOTOPES

FEBRUARY 1991

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2.1 Decommissioning Objectives, Activities, Tasks, & Schedules 2-1

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Attachments:

Floor Plan of The Liposome Company ..... Diagram I

Decontamination Procedure ..... Attachment A

Resumes:

Lee Buccheri, The Liposome Company ..... Attachment B

Steven A. Black, Teledyne Isotopes ..... Attachment C

Teledyne Isotopes RSC&QCM Pertinent Sections ..... Attachment D

Wording of Letter of Credit ..... Attachment E

Decommissioning Cost Estimate ..... Attachment F

Individual Room/Area Diagrams ..... Attachment G

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1.0 General Information & Overview

The Liposome Company
1 Research Way
Princeton Forrestal Center
Princeton, New Jersey 08540

U.S. NRC License No. 29-19918-01

Contact: Lee Buccheri
Phone: 609-452-7061

This document includes 1) a discussion of the site history and expected methods for performing the decommissioning of the facility; 2) a site-specific cost estimate for the decommissioning of the facility; 3) a description of the methods used to assure that there are adequate funds available for the decommissioning of the facility; and 4) a description of the methods that will be used to adjust the site-specific decommissioning cost estimate at periodic time intervals.

2.0 Description of the Planned Decommissioning Activities

2.1 Decommissioning Objectives, Activities, Tasks, & Schedules

2.1.1 Decommissioning Objectives & Activities

The objective is to reduce radioactive contamination levels to below those specified in the U.S. Nuclear Regulatory Commission document entitled "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct, Source, or Special Nuclear Material", dated July 1982. The activities to be performed include the following:

1) Final update and review of the Decommissioning Plan

2) Disposal of any accumulated radioactive waste.

3) A preliminary survey to determine the extent of residual activity.

4) Decontamination, dismantling, demolition and/or packaging of contaminated objects & wastes from decontamination activities.

5) Disposal of any items which cannot be decontaminated and any waste produced from decommissioning activities.

6) A final survey for compliance with the above referenced document.

2.1.2 Description

The Liposome Company is a biotechnology company dedicated to the development of liposome based pharmaceuticals. The primary focus is developing advanced liposomal drugs for treatment of cancer and serious infectious disease. Radioisotopes are utilized in bio-distribution studies and to determine the per cent of liposomal entrapment. Monthly radiation surveys as of the date of this plan indicate minimal contamination of equipment and none to the facility. Radioisotopes are not disposed to the sanitary sewer and volatile compounds have only been used once. Given the history of the facility, it is reasonable to assume that few, if any, difficulties will arise during the decommissioning activities.

2.1.3 Procedures

Based on the history of the site as described above, there seems little reason to expect any major contamination of the facility. The written procedures which will be used will be approved by the persons specified in section 2.2 prior to the start of any hands-on Activities.

2.1.4 Schedules

The sequence of Activities is as follows:

1) Upon notification to proceed with the Decommissioning Plan, the persons specified in section 2.2 will determine if 1) the current Decommissioning Plan is still valid, 2) additional procedures will be written and approved, and 3) any additional training will be performed. Estimated time: 2 days.

2) Teledyne Isotopes will be on-site to perform Activities 2 & 3 within three weeks. Estimated time on-site: 3 days.

3) The results of the preliminary survey and a report should be processed within one month's time. At that time Activities 4 & 5 will commence. Estimated time on-site: 2 days. Areas of concern will be decontaminated according to the enclosed procedures. It will be assumed that 90% of the material can be decontaminated. The volume of waste generated from the decontamination will be estimated to be 5% of the initial volume of the area or object. Walls or floors which cannot be decontaminated will be excavated to an approximate depth of three inches. These materials will be disposed as radioactive waste.

4) Activity 6 will follow all demolition, dismantling and disposal operations. Estimated time on-site: 1 day.

5) The results of Activity 6 will be known and a final report prepared within one month of the completion of the survey. If the final survey indicates the need for additional decontamination, dismantling or disposal, then Activities 4, 5 and 6 will be repeated for the suspect areas.

2.2 Decommissioning Organization and Responsibilities

The person responsible for supervising the Decommissioning Plan is Lee Buccheri. She will be assisted by Steven A. Black of Teledyne Isotopes. Resumes can be found as Attachments B and C. They will be responsible for every aspect of the Plan. If either of these persons are unavailable at the time of the decommissioning, persons with similar experience and qualifications will be used. Further personnel descriptions can be found in sections 2.3 Training and 2.4 Contractor Assistance.

2.3 Training

Teledyne Isotopes personnel have been trained in accordance with their Radiation Safety Code & Quality Control Manual. See Attachment D for copies of the pertinent sections. In addition, all personnel supplied by Teledyne Isotopes that will wear respirators, will have had respirator training. Included in this training is the use and care of full face air purifying respirators and Self-Contained Breathing Apparatus (SCBA). If any new procedures are developed for use during the Decommissioning Plan, personnel will be trained accordingly prior to the implementation of the new procedure.

2.4 Contractor Assistance

Throughout this Plan, The Liposome Company will rely on the expertise provided by Teledyne Isotopes. A team of one Health Physics supervisor and one Health Physics technician will be used for on-site work. Waste removal operations will be performed by a Radwaste Supervisor and a Health Physics technician.

All on-site operations will be conducted under The Liposome Company's U.S. NRC license and the off-site radwaste operations will be performed under Teledyne Isotopes U.S. NRC License No. 29-00055-14. Laboratory analyses and material handling other than radwaste will be conducted under Teledyne Isotopes U.S. NRC license No. 29-00055-06.

Contractor Information:

Teledyne Isotopes
50 Van Buren Avenue
Westwood, NJ 07675

Steven A. Black, R.S.O., Manager
201-664-7070 x225

3.0 Description of Methods Used for the Protection of Occupational and Public Health and Safety

3.1 Facility Radiological History Information

As previously stated, monthly radiation surveys indicate no contamination of the facility and the only item found with fixed contamination was one laboratory scale. Most work with radioisotopes is conducted in lined trays to prevent contamination of the bench tops. Animals used in radioisotope studies are segregated from other animals. To date, there has been one spill of radioactive material. Several milliliters of a labeled solution was spilled and promptly cleaned. Liquid radioactive material is not disposed to the sanitary sewer, it is adsorbed and shipped for land disposal at an approved facility. Preliminary surveys indicate that the hood ductwork is not contaminated and will not require action under this plan. There have been no modifications to the facility to suspect the covering of radioactive contamination.

3.2 Ensuring that Occupational Exposures are As Low As Reasonably Achievable

All activities will be conducted in a manner which will keep exposures to personnel and the environment as low as reasonably achievable. There is little chance of an occupational exposure in excess of 10% of the limits to radiation workers based on the history of the facility. In addition, when taking into consideration whether an item should be decontaminated or disposed, more weight will be given to the disposal option where the costs are roughly equivalent.

3.3 Health Physics Program

Health Physics monitoring will include whole body TLD badges, urinalyses of radiation workers, air sampling for particulates, and the frisking of workers in and out of the exclusion zone during any dismantling or demolition. Smears will be taken around the exclusion zone at the end of each day that such activities are performed.

The preliminary contamination survey will be performed by first monitoring each piece of equipment identified in Table 3 for both fixed and removable radioactive contamination. The smears will be analyzed by liquid scintillation counting. If gamma isotopes are suspected then each smear will also be analyzed by gamma spectroscopy. All floors, benchtops, cabinets, drawers, and dust collecting surfaces in the designated areas will be surveyed for fixed and removable activity. Survey instruments available to be used for the fixed activity monitoring include Eberline Model PAC-4G's with AC-21B probes designed to reveal the presence of beta activity; and Ludlum Model 19 microR meters to determine dose rates. If these specific instruments are unavailable, instruments of comparable efficiency and effectiveness shall be used.

The disposal of all radioactive waste will be performed by Teledyne Isotopes personnel using the procedures found in Attachment A.

All decontamination, dismantling, demolition and/or packaging of contaminated objects and wastes from decontamination activities will be performed by Teledyne Isotopes personnel. It is assumed that the only procedures that will be used are the Equipment and Area Decontamination and radioactive waste packaging procedures. Air samples will be taken if any operations generate dust and they will be analyzed by the method most appropriate for the suspected radionuclides. If levels greater than 10% of the MPC are observed, personnel will be required to wear full face respirators fitted with radionuclide cartridges, and disposable coveralls, boots, and gloves.

A final survey for compliance with the "Guidelines for Decontamination..." will be done in suspect areas if the preliminary survey indicates the need for any decontamination or dismantling. The same procedures identified previously in this section will be used here for the suspect areas.

3.4 Contractor Personnel

See sections 2.3 and 2.4.

3.5 Radioactive Waste Management

The disposal of all radioactive waste will be performed by Teledyne Isotopes personnel using the procedures found in Attachment A.

4.0 Planned Final Radiation Survey

All compliance surveys will consist of radiation monitoring of the walls, equipment, floor and dust collecting surfaces. Direct radiation surveys will be conducted with an Eberline Instrument PAC-4G gas proportional survey meter with a 50 cm^2 probe and a 500 cm^2 floor monitor designed to reveal the presence of low energy beta radiation. A micro R meter, sensitive to gamma radiation, will be used to determine dose rates at representative areas of the facility. Removable radioactive contamination surveys will consist of smear samples taken by wiping approximately 200 cm^2 of surface area with an absorbant material at representative areas of the facility. Diagrams will be provided to identify where smear samples were taken. Smear samples will be analyzed by liquid scintillation counting with standard solutions traceable to the National Institute of Standards and Technology

Also see section 3.3.

5.0 Funding

This Decommissioning Plan will be funded by providing a Letter of Credit. This value is the amount estimated to perform the complete decommissioning as detailed in this Plan. Annually the amount of the Letter of Credit will be adjusted according to the Consumer Price Index and any major change in the costs of disposal of radioactive waste.

The wording of the Letter of Credit will be comparable to that shown in Attachment E.

See Table 6 in Attachment F for the summary of costs.

6.0 Physical Security Plan and Material Control And Accounting Plan Provisions in Place During Decommissioning

Due to the levels of activity allowed on this license and the security already in place to prevent unauthorized access to the facility, no additional precautions for security will be implemented during decommissioning activities.

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DIAGRAM I

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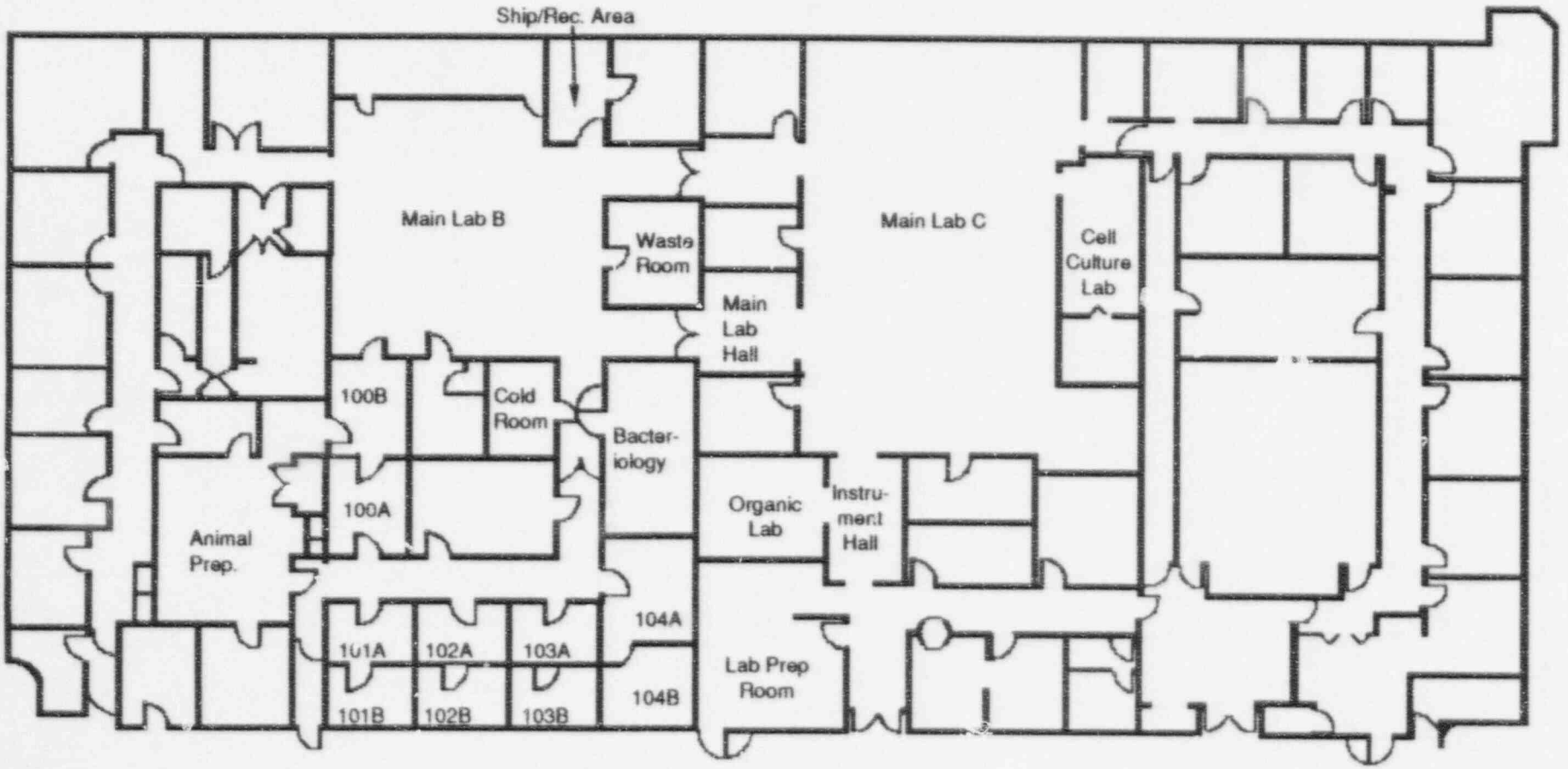
The Liposome Company, Inc.
Radioisotope Usage Areas

1 Research Way • Princeton Forrestal Center
Princeton • NJ • 08540



February 1991

Approximate Scale: 1/2" = 10 feet

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ATTACHMENT A

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TELEDYNE ISOTOPES

EQUIPMENT AND AREA DECONTAMINATION

Purpose: To clean equipment or areas contaminated with radioactivity to levels suitable for their intended use or release from regulatory control.

Discussion: When working with loose radioactive material, a small quantity may become deposited on surfaces other than those in the designated area. Often, this can be cleaned using moistened towels, and a cleaning agent. Remember, even if a surface "looks clean" there may be contamination present. Only proper monitoring equipment and techniques can detect contamination.

Equipment: Absorbant cloth or paper towel, Radiacwash, Knox-on, survey meter, swipes, radwaste container, PPE appropriate to the situation, warning signs

Procedure:

1) Assemble the necessary materials and equipment prior to the start of the decontamination.

2) Restrict access to the area to prevent the spread of contamination.

3) Survey the area with a meter and/or smears to obtain an estimate of the levels of contamination.

4) Don the proper personal protective equipment (PPE) based on the survey results and the Health Physicists' direction.

5) Start in the least contaminated area and work towards the more contaminated area. Make only one pass with the cleaning cloth, then fold it over and use the other side or place it in the contaminated trash bag.

6) Clean using straight, even passes of the cloth. Avoid circular motion, as this will only spread the contamination around.

7) Upon completion of the decontamination, re-survey the area for both fixed and removable radioactivity. Record the results and submit the data to the Health Physicist for approval and authorization to release the area.

Safety Items: Any technician without prior experience in decontamination must be supervised by an experienced individual.

Additional Information: Ensure that the proper survey meter is used for the radionuclides suspected in the contamination. Refer to appropriate regulatory guidelines for release limits.

Forms Used: None

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ATTACHMENT B

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ELIZABETH BUCCHERI
Box 52-M Ross Lane
Jackson, New Jersey 08527

EDUCATION

M.S. Zoology 1982 **Rutgers University, Newark, NJ**
B.S. Biology 1980 **Upsala College, East Orange, NJ**
Minor - Chemistry. Cum Laude.

EXPERIENCE SUMMARY

Six years diversified scientific and business experience involving scientific research, personnel, laboratory safety and health management, radiation safety management and training, and laboratory/facility management.

EXPERIENCE

The Liposome Company, Inc., Princeton, NJ
Manager of Administrative and Technical Services

November 1985 to Present

Responsibilities:

Safety - Chairperson of Company Safety Committee. Conduct safety orientation and training programs. Write safety and emergency procedures manuals. Monitor accidents, personal protective equipment and OSHA compliance. Responsible for hazardous waste management and disposal.

Radiation Safety - Conduct radiation safety training, coordinate safety surveys. Responsible for radioactive materials management and waste disposal. Nuclear Regulatory Commission liaison.

Laboratory Management - Supervise a twelve room USDA registered animal facility, and complete annual USDA reports. Coordinate Institutional Animal Care and Use Committee. Supervise Glassware Preparation Facility, including the writing of Standard Operating Procedures.

Facility Management - Supervise general facilities maintenance program. Coordinate contract maintenance and repair for electrical, plumbing and construction projects.

Communications - AT&T systems management including programming of both Horizon & System 25 equipment. Responsible or system implementation, maintenance and employee training. Coordinate with New Jersey Bell & AT&T for service and repair.

Managerial - Supervise animal facility staff, Glassware Prep Technicians, and maintenance staff.

EXPERIENCE (Continued)

November 1985 to April 1987 — **Administrative Supervisor**

Responsibilities:

In addition to above, handled human resources responsibilities including maintenance of personnel records, benefits administration, recruitment and salary surveys. Assisted in developing the Company Employee Guidebook. Computerized the Human Resource function.

April 1983 to November 1985 — **Research Associate**

Coordinated, conducted and analyzed *in vivo* and *in vitro* biodistribution, efficacy and toxicity assays of drug dosage forms. Performed studies using radiolabeled drugs in animal models. Performed surgery and dissections. Prepared liposomal formulations and controls.

SEMINARS/ COURSES

New Jersey Institute of Technology, Asbury Park, NJ. "Medical Waste Workship", October 16, 1989.

The Center for Professional Advancement, East Brunswick, NJ. "Hazardous Waste Management", August 28-31, 1989.

Cook College Continuing Professional Education, New Brunswick, NJ. "Basic Radioisotope Theory", "Biological Effects of Ionizing Radiation", "Radioisotope Laboratory Safety", "Radiation Instrumentation", "Liquid Scintillation Counting", "Radiation Protection Program Management", "Radioactive Materials Transportation Regulations", "Radioactive Waste Management", February 27-March 15, 1989.

The Center for Professional Advancement, East Brunswick, NJ. "Safety in the Chemical Laboratory", December 7-8, 1987.

Mercer County College, "Contracts and Specifications and the Law", Spring 1988; "Blueprint Reading", Fall 1989.

MEMBERSHIPS

American Society of Safety Engineers

New Jersey Chapter Health Physics Society

ATTACHMENT C

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RESUME

TELEDYNE ISOTOPES

Steven A. Black, Manager, R.S.O.

Employment Experience
1/77 - Current

TELEDYNE ISOTOPES
Mr. Black presently manages operations in the Radiological Services Department of Teledyne Isotopes and is responsible for implementation of the facility's health physics program as the company's Radiation Safety Officer, and the facility's industrial/ laboratory safety program as the Chairman of the Safety Committee. He has also been named the Plant Emergency Officer and is in charge of all evacuation and emergency procedures.

Specific duties include the following:

- Operational control of the Health Physics & Radioactive Waste product lines.
- Determining prices, preparing bids, and designing brochures.
- Maintaining the chemical inventory and proper hazardous waste disposal.
- Radioactive & hazardous materials shipping compliance.
- Compliance with N.J. Dept. of Environmental Protection Divisions of Air & Water Quality.
- Compliance and maintenance of six U.S. Nuclear Regulatory Commission licenses for the possession and use of radioactive materials.
- Compliance and maintenance of an Illinois state license and a New Jersey state license for the possession and use of radioactive materials.
- Implementing the facility's Right-To-Know program for employees and for emergency service personnel.
- Computerization of all facets of the business using both BASIC and UNIX based systems.
- Preparing and updating employee evacuation plans.
- Safety orientation training for all new employees prior to their starting to work.
- Plant Emergency Officer and the liaison with the local volunteer fire department.

Special Assignments

Mr. Black supervised the decontamination of the Department of Energy's New Brunswick laboratory located in New Brunswick, NJ and the removal and packing of approximately 21,000 cubic feet of thorium metal waste at a facility in New York. These projects included the coordination of decontamination procedures, maintaining radiation safety records, and packaging radioactive wastes according to U.S. Department of Transportation, U.S. Nuclear Regulatory Commission, and burial site laws, rules, and regulations.

Education

Brown University
Providence, Rhode Island
B.A. Biology 1975

Other: Has completed a course in Radiation Protection at Harvard School of Public Health (1977) and a Rutger's University Radiation Science introductory course for the Master's program in Health Physics (1980). He has also completed numerous short courses on the packaging and transport of radioactive waste.

Professional Affiliations

Nuclear Waste Brokers and Processors Association - founder & Secretary
National Health Physics Society - member since 1986
NJ Chapter of the Health Physics Society - member since 1980

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ATTACHMENT D

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TELEDYNE ISOTOPES

RADIATION SAFETY PROCEDURES

SECTION II - GENERAL PROCEDURES FOR CONTROLLING RADIOACTIVE MATERIALS AND RADIATION EXPOSURES

This section deals with the general procedures for radiation protection which apply to the activities carried on under the several licenses currently in effect. Specific procedures relating to activities under particular licenses are included as sub-sections of Section III of this manual.

II-1.0 INDOCTRINATION OF PERSONNEL EXPOSED TO IONIZING RADIATION

II-1.1 *Company Policy on Matters Involving Radiation Exposure*

Work performed under the various licensed activities treated in this manual require in some cases some degree of exposure to radiation by operating personnel. It is necessary, therefore, to classify these individuals in the population subgroup of occupational radiation workers. For individuals classified in this group, radiation exposure must be recorded on the employee's radiation exposure history while in the employ of Teledyne Isotopes.

II-1.2 *Indoctrination of Personnel*

All persons starting to work with any radiation sources at Teledyne Isotopes are required to read this Radiation Safety Code and this is documented on Form IWL-HP-07. In addition, each employee is required to furnish as complete a history as possible of their training in the principles and practices of radiation protection. This is documented on Form IWL-HP-06. A basic radiation safety course is then presented to each employee. Included is the showing of a ten part film series entitled "The Story of Radiation", distributed by Training Resources, a division of Nuclear Support Services. The outline of this course is given on Form IWL-HP-07 and this form is used as documentation of the presentation. These records are kept in the person's health physics folder. Periodically, lectures and films on radiation safety are shown to keep all personnel appraised of the necessity for safe operating procedures.

Form IWL-HP-06 is given to the supervisor of the employee who then fills in the section requesting authorization for the employee. This form is sent to the Radiation Safety Officer who will determine what additional training or monitoring is required for the employee to begin work utilizing radioactive materials.

Persons who through their work attitudes and habits show a disregard for safe operating procedures with radioactive material are recommended for transfer out of radiation work or, if such alternative work is not available, may be terminated from employment.

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II-8.0 RADIOACTIVE WASTE PACKAGING & DISPOSAL

Radioactive waste materials are disposed of by the Radiological Services Department in accordance with all federal, state and local regulations. The generators of the waste are trained in the proper method of packaging the waste and then tested on their knowledge to ensure compliance. The materials will be packaged using the "Classification of Radioactive Waste to be Packaged for Shipment" as a guide, and in conformance with the "Packaging Procedure for Radioactive Waste".

II-8.1 *Training and Retraining of Personnel Involved With the Safe Packaging of Radioactive Material*

Any person engaged in the preparation of waste for disposal must be properly trained in all the DOT, NRC and burial site requirements for proper packaging. The training program is as follows:

8.1.1 Each person is given a copy of the current Radiation safety Code and Quality Control Manual. He is to study these procedures (II-8.2 and II-8.3) and then be tested on his knowledge of the material using Form IWL-RW-231, "Packaging of Radioactive Waste Examination".

8.1.2 Subsequent to the examination, each person will be physically supervised in the proper classification and packaging of waste in his area. Using Form IWL-RW-206, the supervisor will document such on-the-job training.

8.1.3 When the supervisor is satisfied the person has demonstrated a complete understanding of the procedures, he will notify the Radiation Safety Officer, who will authorize the individual to perform these procedures unsupervised and will document this on Form IWL-RW-206.

8.1.4 Retraining of the individual in the most current DOT, NRC, and burial site packaging requirements is to be performed at a maximum one year interval unless significant changes require immediate review. Retraining and review will be documented using Form IWL-RW-206, or by filing a memorandum in each trainee's training folder.

II-8.2 *Classification of Radioactive Waste to be Packaged for Shipment*

8.2.1 Characteristics of Material to be Packaged

Isotope
Activity (mCi)
Physical State (solid, liquid, vials, carcasses, biological matter or gas)
Concentration (mCi/gram)
A_1, A_2 Values
Form (Normal or Special)
10CFR Part 61 Class A, B, C Stable or Unstable
Chemical Form

8.2.2 Proper Shipping Name and UN ID Number

Radioactive Material, Limited Quantity, n.o.s. (UN2910)
Radioactive Material, Low Specific Activity or LSA, n.o.s. (UN2912)
Radioactive Material, n.o.s. (UN2982)
Radioactive Material, Special Form, n.o.s. (UN2974)
Radioactive Material, fissile, n.o.s. (UN2918)
Radioactive Material, Instruments & Articles (UN2911)
Uranyl Acetate (RQ-5000/2270) (NA9180)
Uranyl Nitrate, solid (RQ-5000/2270) (UN2981)

8.2.3 Determination of Shipment Specification

What specification container is required.
What labels are required.
Whether a security seal is needed or not.
mR/hr limits @ contact.
Additional requirements.

II-8.3 *Packaging Procedures for Radioactive Waste*

8.3.1 General

8.3.1.1 Categories of Radioactive Waste:

There are three disposal facilities being used and the categories for each are listed below:

8.3.1.1.1 BURIAL AT RICHLAND, WASHINGTON

(DMR) Dry Material destined for Richland
(DCR) Dry Compactibles destined for Richland
(SVR) Small Volume liquids destined for Richland
(LVR) Large Volume liquids destined for Richland
(ACR) Animal Carcasses or biological waste destined for Richland

8.3.1.1.2 PROCESSING AT QUADREX HPS, GAINESVILLE, FLORIDA

(VXN) Scintillation Vials - NRC exempt - Non RCRA regulated
(VRN) Scintillation Vials - NRC regulated - Non RCRA regulated
(VXR) Scintillation Vials - NRC exempt and RCRA regulated
(VRR) Scintillation Vials - NRC regulated and RCRA regulated

8.3.1.1.3 PROCESSING AT SCIENTIFIC ECOLOGY GROUP, OAK RIDGE, TENNESSEE

(DMS) Dry solid Material destined for S.E.G.
(DCS) Dry solid Compactible destined for S.E.G.
(SVS) Small Volume liquid destined for S.E.G.

TELEDYNE ISOTOPES

RADIOACTIVE MATERIAL PACKAGING GUIDE

MATERIAL DESCRIPTION	CONTAINER TYPE	LABEL REQUIRED	SECURITY SEAL REQUIRED	INTERNAL PACKAGING REQUIRED	mR/hr LIMITS @ CONTACT	COMMENTS
DRY SOLID MATERIAL						
a. Radioactive Material, LSA, n.o.s. (exclusive-use)	Unspecified	Radioactive-LSA	no	Unspecified	0-200.0	
b. Radioactive Material, Limited Quantity, n.o.s.	Unspecified	Radioactive	no	Unspecified	0-0.5	
c. Radioactive Material, Instruments & Articles	Unspecified	Radioactive	no	Unspecified	0-2.0	mR/hr limits @ contact 0-2.0 if shipped exclusive-use
d. Radioactive Material, n.o.s.	DOT 7A-Type A	Radioactive White I	yes	Braced	0-0.5	Require weight printed on outside of package when in excess of 110 lbs.
		Radioactive Yellow II	yes	Braced	0.5-50.0	
		Radioactive Yellow III	yes	Braced	50.0-200.0	
e. Radioactive Material, special form, n.o.s.	DOT 7A-Type A	Radioactive White I	yes	Braced	0-0.5	Require weight printed on outside of package when in excess of 110 lbs.
		Radioactive Yellow II	yes	Braced	0.5-50.0	
		Radioactive Yellow III	yes	Braced	50.0-200.0	
SMALL VOLUME LIQUIDS						
a. Radioactive Material, LSA, n.o.s. (exclusive-use)	DOT 7A-Type A	Radioactive-LSA	no	*See Instructions	0-200.0	
b. Radioactive Material, n.o.s.	DOT 7A-Type A	Radioactive White I	yes	*See Instructions	0-0.5	Require weight printed on outside of package when in excess of 110 lbs.
		Radioactive Yellow II	yes	*See Instructions	0.5-50.0	
		Radioactive Yellow III	yes	*See Instructions	50.0-200.0	
LARGE VOLUME LIQUIDS						
a. Radioactive Material, LSA, n.o.s. (exclusive-use)	DOT 7A-Type A	Radioactive-LSA	no	*See Instructions	0-200.0	
b. Radioactive Material, n.o.s.	DOT 7A-Type A	Radioactive White I	yes	*See Instructions	0-0.5	Require weight printed on outside of package when in excess of 110 lbs.
		Radioactive Yellow II	yes	*See Instructions	0.5-50.0	
		Radioactive Yellow III	yes	*See Instructions	50.0-200.0	
ANIMAL CARCASSES						
a. Radioactive Material, LSA, n.o.s. (exclusive-use)	DOT 7A-Type A	Radioactive-LSA	no	*See Instructions	0-200.0	
b. Radioactive Material n.o.s.	DOT 7A-Type A	Radioactive White I	yes	*See Instructions	0-0.5	Require weight printed on outside of package when in excess of 110 lbs.
		Radioactive Yellow II	yes	*See Instructions	0.5-50.0	
		Radioactive Yellow III	yes	*See Instructions	50.0-200.0	

* SPECIAL NOTE ON SMALL VOLUME LIQUIDS: Scintillation vials and fluids must be packaged separately from all other small volume liquids.

NOTE: n.o.s. means: "not otherwise specified."

IWL-0372-451

Date: Initials:

Reviewed: _____ _____

Revised: 11/90 _____

8.3.1.2 Items in different categories cannot be mixed in any one container unless specifically authorized.

8.3.1.3 The packaging procedure that is used is to be marked on the drum (e.g. DMR-8/87)

8.3.1.4 Transuranic and radium waste in excess of 10 nanocuries per gram is not acceptable unless specifically authorized.

8.3.1.5 Gaseous waste must meet certain provisions. Please see the burial site's license for details or call the Radiological Services Department Office.

8.3.1.6 Special Nuclear Material requires specific approval and will be accepted only upon special request to the Radiological Services Department Office.

8.3.1.7 DO NOT EXCEED THE FOLLOWING WEIGHTS UNLESS SPECIFICALLY AUTHORIZED:

5 gallon container - 80 lbs.
30 gallon container - 300 lbs.
55 gallon container - 480 lbs.

8.3.1.8 Chemical Toxicity:

The chemical composition of the materials disposed must be compatible with the procedures which follow. Any additional hazards of the material must be evaluated to determine if additional packaging is required. If materials are listed in J. Irving Sax's "Dangerous Properties of Industrial Materials", Fifth Edition, Van Nostrand Reinhold, as having a THR=HIGH via any route, except IP or IV, specific approval must be obtained from the State of Washington Radiation Control Program. Contact the Radiological Services Department for details.

8.3.1.9 Prohibitions

8.3.1.9.1 Burial Prohibitions:

Lead and other U.S. EPA hazardous wastes are prohibited from land burial at the current radioactive waste disposal sites. Please ensure there are no Resource Conservation and Recovery Act (RCRA) wastes in your radioactive waste streams.

8.3.1.9.2 Scintillation Vial Processing

Only those isotopes listed in the Quadrex license are allowed for processing. In addition, strict control must be held over the packaging of scintillation vials. No other wastes of any kind are allowed in these containers.

8.3.1.10 Special Notes

Two 2 mil liners may be used in place of a single 4 mil liner.

Instead of lining the whole drum, individual 4 mil (or double 2 mil) bags may be substituted, provided each bag is layered as above.

For a list of approved absorbants, solidification and stabilization media for use with waste destined for Richland, please see the US Ecology license.

When layering, the absorbant must be the first layer on the bottom and the last layer on the top. Proper volume ratios must be determined by the generator to be used for the different absorbants.

The amount of absorbant must be capable of absorbing twice the amount of liquid present.

8.3.1.11 VOIDS - All voids in the containers must be filled to the extent practicable.

8.3.2 WASTE FOR BURIAL AT US ECOLOGY, RICHLAND, WASHINGTON

8.3.2.1 DRY SOLID MATERIAL FOR BURIAL AT RICHLAND, WASHINGTON (DMR-8/87)

8.3.2.1.1 Select a 5, 30 or 55 gallon drum.

8.3.2.1.2 Fill to capacity with only dry solid materials.

8.3.2.1.3 Fill in any voids to the extent practical.

8.3.2.1.4 Secure drum cover.

8.3.2.1.5 Label drum DMR-8/87, to designate that the drum has been packaged according to these directions.

8.3.2.2 DRY SOLID COMPACTIBLES FOR BURIAL AT RICHLAND, WASHINGTON (DCR-8/87)

8.3.2.2.1 Select a 30 or 55 gallon container.

8.3.2.2.2 Place waste into double 4 mil plastic liners. (Note: For 55 gallon drums, use two sets of double 4 mil bags, each set approximately 27 gallons. If heavy materials are used, please use additional double 4 mil liners and decrease the quantity put into each.)

8.3.2.2.3 Twist and seal liners.

8.3.2.2.4 Place double 4 mil bags into the selected container.

8.3.2.2.5 Replace lid and ring.

8.3.2.2.6 Secure ring. DO NOT BOLT.

8.3.2.2.7 Label drum DCR-8/87 to indicate it was packaged in accordance with these instructions.

NOTE: DO NOT DISPOSE OF UNPROTECTED SHARP OBJECTS.

NOTE: DO NOT DISPOSE OF NON-COMPACTIBLE ITEMS IN THESE TYPES OF CONTAINERS.

NOTE: ONLY LOW SPECIFIC ACTIVITY MATERIAL IS ACCEPTABLE IN COMPACTIBLE DRUMS. UNDER NO CIRCUMSTANCES SHOULD SOURCES BE PLACED INTO THESE CONTAINERS.

8.3.2.3 SMALL VOLUME LIQUID WASTE DESTINED FOR RICHLAND (SVR-8/87)

These drums can contain vials which contain liquids which are acceptable for burial, and each vial must contain less than 50 ml of liquid.

Liquid should not be absorbed directly onto the absorption media (e.i. do not open vials). Any tool or device which contains free standing liquid must be considered small volume liquid waste. Please reference the definition of free standing liquid as found in US Ecology's license.

8.3.2.3.1 Select only a 30 or 55 gallon drum; 5 gallon pails are not allowed.

8.3.2.3.2 Line the drum with 4 mil thick poly liner.

8.3.2.3.3 Using an approved absorbant, alternate layers of absorbant with layers of waste.

8.3.2.3.4 Twist and seal liner.

8.3.2.3.5 Secure drum cover.

8.3.2.3.6 Label drum SVR-8/87, to designate that the drum has been packaged according to these instructions.

8.3.2.3.7 Special Note: Toluene, Xylene and other flammable liquids in scintillation vials will not be accepted for burial. They must be packaged for reprocessing and meet the reprocessor's license criteria.

8.3.2.4 LARGE VOLUME LIQUID WASTE DESTINED FOR RICHLAND (LVR-8/87)

All items containing 50 ml or more of an aqueous liquid may not be disposed in SVR or SVS drums. The liquid must be packaged as follows while the container itself must be either (1) dried and placed in a DMR, DCR, DMS or DCS drum or (2) placed in an SVR or SVS drum once the bulk of the liquid is removed.

8.3.2.4.1 Select only the 55 gallon double-walled container for liquid waste.

8.3.2.4.2 Remove the 55 gallon drum cover.

8.3.2.4.3 Loosen and remove the bung from the 30 gallon drum which has been filled with an approved absorbant.

8.3.2.4.4 Pour up to 10 gallons of liquid (pH-6.0 - 9.0) into the absorbant in the 30 gallon drum through the 2-1/2" opening.

8.3.2.4.5 Replace bung and tighten.

8.3.2.4.6 Twist and seal poly liner.

8.3.2.4.7 Secure cover of 55 gallon drum.

8.3.2.4.8 Label drum LVR-8/87 to designate that the drum has been packaged according to these instructions.

8.3.2.4.9 SPECIAL NOTE

Toluene or Xylene and other liquids unacceptable at the burial site cannot be absorbed.

8.3.2.5 ANIMAL CARCASSES OR BIOLOGICAL WASTE (ACR-8/87)

Animal carcasses or biological waste must be disposed using a double-walled container. Be sure when ordering to specify a 55 gallon double-walled container for animal carcasses.

8.3.2.5.1 Select only a 55 gallon double-walled drum.

8.3.2.5.2 Remove inner 30 gallon container and absorbant.

8.3.2.5.3 Line 30 gallon drum with 4 mil poly liner. See Section 8.3.1.10.

8.3.2.5.4 Package waste into liner using at least one part slaked lime for every 10 parts of an approved absorbant. Fill completely.

8.3.2.5.5 Twist and seal liner.

8.3.2.5.6 Seal 30 gallon drum.

8.3.2.5.7 Place 30 gallon drum in 50 gallon drum.

8.3.2.5.8 Place absorbant around and covering 30 gallon drum.

8.3.2.5.9 Secure 55 gallon drum cover.

8.3.2.5.10 Label drum ACR-8/87 to designate that drum has been packaged according to these instructions.

8.3.3 RADIOACTIVE WASTE FOR PROCESSING AT S.E.G., OAK RIDGE, TENNESSEE

8.3.3.1 DRY SOLID MATERIAL DESTINED FOR S.E.G. (DMS-8/87)

8.3.3.1.1 See the procedure for DMR and follow exactly, except for labelling the container DMS-8/87, however, only Class A unstable materials are acceptable. Please see the S.E.G. license for further details on acceptable materials.

8.3.3.2 DRY SOLID COMPACTIBLE DESTINED FOR S.E.G. (DCS-8/87)

8.3.3.2.1 See the procedure for DCR and follow exactly, except for labelling the container DCS-8/87, however, only Class A unstable materials are acceptable. Please see the S.E.G. license for further details on acceptable materials.

8.3.3.3 SMALL VOLUME LIQUIDS DESTINED FOR S.E.G. (SVS-8/87)

8.3.3.3.1 See the procedure for SVR and follow exactly, except for labelling the container SVS-8/87.

8.3.3.3.2 The liquids present must be strictly incidental. A couple of examples of incidental liquids are:

a) A drop in the end of a pipette
b) A couple of milliliters in the bottom of a vial
c) Moisture on the sides of a beaker

8.3.3.3.3 Use the absorbant sparingly.

SPECIAL NOTE: In the SVS drum you may mix other dry waste which would be suitable for either the DMS or DCS container. You do not have to segregate these three types as long as the drum is classified as an SVS-8/87.

8.3.4 SCINTILLATION VIAL WASTE FOR REPROCESSING AT QUADREX, GAINESVILLE, FLORIDA (VXN, VRN, VXR, VRR)

These drums may contain scintillation vials which contain Toluene or Xylene or any other flammable scintillation media acceptable according to Quadrex's License No. 1354-1 (State of Florida, Department of Health & Rehabilitative Services).

All drums to Quadrex are packaged identically using the procedure below, however, the labelling and manifesting are specific to the classification selected. The generator is responsible for identifying the isotopes, concentrations and chemical forms of the waste material.

8.3.4.1 Select only a 30 or 55 gallon drum.

8.3.4.2 Line the drum with 4 mil thick poly liner.

8.3.4.3 Add 12 inches of an approved absorbant.

8.3.4.4 Line drum again with another 4 mil thick poly liner.

8.3.4.5 Fill with vials or other containers of less than one pint capacity.
NOTE: With one pint containers, add absorbant to suitably cushion these to prevent breakage.

8.3.4.6 Twist and seal liners.

8.3.4.7 Top off the drum with additional absorbant.

8.3.4.8 Secure drum cover.

8.3.4.9 Label drum with the appropriate designation for the descriptions below.

8.3.4.10 Classification of Scintillation Vial Drums

There are many different types of scintillation fluids being used by the industry. The major differences between these fluids is their flashpoint. The state your facility is in may, or may not, regulate these fluids as hazardous waste. Although we have been and will continue to help identify when and where the RCRA regulations apply, it is the generator's responsibility under RCRA regulations to determine if his waste stream is a Hazardous Waste.

"V" - For marking purposes, all scintillation vial drums will have a first character of "V".

"X" or "R" - The second character will be either an "X" or and "R". If the drum contains only H-3/C-14 in less than 0.05 uCi/gram concentrations it is an "X". If the drum contains H-3/C-14 as above plus other isotopes listed in Quadrex's license, then it is an NRC "R"egulated material and would be an "R".

"N" or "R" - The third character indicates whether the drum is US EPA RCRA "R"egulated or "N"ot regulated. This classification is simple for those who use a high (greater than 140 F) flashpoint cocktail as these fluids are "N"ot RCRA regulated. If you have a cocktail with a lower flashpoint, the material may, or may not, be "R"egulated. This depends on each state. As the states are currently changing their positions rapidly, we have not included a listing in these procedures. Please call for further information.

TELEDYNE ISOTOPES

SECTION III - SPECIAL PROCEDURES APPLICABLE TO ACTIVITIES UNDER SPECIFIC LICENSES

Teledyne Isotopes carries out activities involving radioactive material under 13 different licenses from state, national, and foreign government authorities. In addition to continuing licenses, other activities are carried out under temporary permits or reciprocal recognition of existing licenses with a variety of special requirements. Because the Radiation Safety Code and Quality Control Manual may be required to support the application for or operation under a given license, it is designed in such a way that only the general provisions of the code and the provisions particularly applicable to a given license are included in copies presented to a given agency.

This copy includes the sections relevant to the licensed activities checked below.

____	III-1.0	USAEC Byproduct Material License (No. 29-00055-06) C Specific License of Broad Scope
✓	III-2.0	USNRC Materials License (No. 29-00055-14) (Radioactive Waste Disposal)
____	III-3.0	USNRC Special Nuclear Materials License (No. SNM-107)
____	III-4.0	USNRC Materials License (No. 29-00055-15) (Metal Decontamination)
____	III-5.0	USNRC Depleted Uranium Source Material License (No. SUB-1235)
____	III-6.0	USNRC Byproduct Material License (No. 29-00055-02) (Teletrace)
____	III-7.0	Colombia, South America License for Importation or Use of Radionuclides (No. 320) (Licencia Para Importacion o Manejo de Radionuclides No. 320) (Teletrace)
____	III-8.0	State of New Jersey, Dept. of Environmental Protection, Radioactive Material License (No. 10123)
____	III-9.0	US Dept. of H.E.W. Clinical Laboratory License (No. 29-1012) (Radio-Bioassay)
____	III-10.0	Radiation Surveys
____	III-11.0	Atomic Energy Control Board of Canada Radioisotope License
____	III-12.0	Refinery Process Research Amendment Application Process for NRC License #29-00055-06
____	III-13.0	State of Illinois Radioactive Material License (No. IL-00514-01)

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III-2.0 RADIOACTIVE WASTE DISPOSAL

III-2.1 *Introduction to Radioactive Waste Licensing Section*

The procedures incorporated in this part cover provisions of Teledyne Isotopes' NRC License #29-00055-14 and New Jersey State License No. NJSL-10123, and other applicable local, state and federal laws, rules and regulations.

This license is for the pickup and transportation of prepackaged radioactive waste materials from customer's facilities. Dry waste packages may also be opened and compacted and repackaged in accordance with the procedures described herein.

III-2.2 *Licenses*

The following pages are copies of Teledyne Isotopes NRC License #29-00055-14 and New Jersey State License No. NJSL-10123, with the most recent amendments.

III-2.3 *Training & Certification of Radioactive Waste Disposal Technicians*

The purpose of this section is to establish procedures whereby individuals will be trained in all aspects of radioactive waste disposal regulations, techniques and procedures.

Due to the highly technical expertise required to enable an individual to perform a radioactive waste pickup-transfer, these procedures must be followed to insure the individual is qualified to perform these pickups/transfers. Due to the connection of DOT and NRC regulations both are covered in these procedures.

2.3.1 All radioactive waste technicians (drivers) are required to fill out the following forms before commencing work:

Description	Form No.
1. Application for employment	IWL-RW-217
2. State of violations	IWL-RW-218

2.3.2 An "Inquiry to State Agency for Driver's Record", Form IWL-RW-219 must be filled out by the supervisor and mailed along with the applicable fee.

2.3.3 Driver must take DOT written examination, Form IWL-RW-220, pp. 1-4. Upon completion of test, supervisor must grade and offer the correct answers to the driver. Supervisor must then issue a "Certificate of Written Examination", Form IWL-RW-221, to the driver.

2.3.4 Driver must be road tested on the equipment he is to use, documenting this on Form IWL-RW-222, "Driver Road Test".

2.3.5 Driver must be given a physical examination by a qualified physician using Form IWL-RW-223. Upon satisfactory completion of the physical, the driver will be given a copy of the bottom of Form IWL-RW-223 entitled "Medical Examiner's Certificate".

2.3.6 User Request Form IWL-HP-06 is to be completed by the individual, his supervisor, and the Health Physics Section as detailed on the form.

2.3.7 All drivers are then indoctrinated in the basics of radiation safety, including, but not limited to, atomic structure, radiation units and the interaction of radiation with matter. The outline of this course is presented on Form IWL-HP-07. The formal course lasts for approximately two (2) hours. Persons authorized to conduct this course are: 1) the Radiation Safety Officer; 2) the Alternate Radiation Safety Officer; 3) any individual so authorized by the Radiation Safety Committee.

2.3.8 Each driver is given a copy of the current Radiation Safety Manual, including Section III-2. He is to study this section and then is tested on his knowledge of the material using Form IWL-RW-224 entitled "Radioactive Waste Procedure Examination". It is graded by his supervisor and any wrong answers are clarified to his satisfaction.

2.3.9 Subsequent to the items above, each driver is subject to on-the-job training for a period of at least one week. This requires that either the supervisor, or another senior person capable of instructing all facets of the job, is physically present with the new employee throughout all phases of the pickup operation.

2.3.10 The person performing the training reports to the Radiation Safety Officer as to the competence of the new employee. If so required, additional supervised on-the-job training and classroom training are performed. Otherwise, the new employee is allowed to perform his job function with periodic spot checks on his performance made by his supervisor.

2.3.11 Periodic retraining of the most current NRC, DOT and burial site regulations are performed. This is documented using Form IWL-RW-208 or a copy of a memo which lists the items discussed is kept in the driver's training file.

2.3.12 An "Annual Review of Driving Record" is performed and documented using Form IWL-RW-225 during the anniversary of each new employee, or at a conveniently scheduled time not to exceed thirteen months.

2.3.13 Each individual authorized by the Radiation Safety Officer to operate the radioactive waste compactor must have a thorough understanding of the procedures found in Section III-2.4.12 of the manual and our Respiratory Safety Manual IWL-8214-482. This will be documented on Form IWL-RW-206.

III-2.4 *Receiving, Transportation and Storage of Radioactive Waste*

The danger involved in picking up radioactive wastes is very small; however, to insure that all conditions of the applicable NRC, Agreement State, DOT and burial site regulations are complied with, these procedures will be strictly adhered to by all personnel while in the process of picking up radioactive wastes from any facility. A copy of this section will be located in each of the vehicles and in the warehouse.

2.4.1 Preparation for Pickup

2.4.1.1 Use the following checklist to insure you have the proper equipment.

CHECKLIST FOR RADIOACTIVE WASTE PICKUP (FORM IWL-RW-207)

Table A - Health Physics Department

TLD Badge
GM Survey Meters:
1 - 50 mR/hr range with thin end window (e.g. E-120)
1 - 1000 mR/hr range (e.g. E-130G)
Filter papers or other absorbant paper

Table B - Department of Transportation Equipment

Driver's Log Book
Radioactive Waste Delivery/Pickup Forms
Radioactive Waste Manifest Forms
Appropriate maps
Work gloves

2.4.1.2 Miscellaneous equipment (e.g. Security Seals, ratchet wrench, waste manifest forms, screwdriver, portable 5-gallon pail sealing tool, labels: Rad I, II, and III, Flammable Liquid, etc., cash, credit cards, nuts, bolts, marker, pens, etc.).

2.4.1.3 Map out the route you intend to use.

2.4.1.4 Special Precautions:

Assure that no unauthorized bridge or tunnel is used. Be sure that you have the telephone numbers of all bridges/tunnels you intend to use which require advance notification. See Form IWL-RW-205 for a listing.

2.4.2 Traveling

2.4.2.1 Before departing and at the beginning of each day, perform the vehicle inspection as detailed in your driver's log book.

2.4.2.2 Be aware of your fuel supply at all times.

2.4.3 Receiving Waste

2.4.3.1 Upon arrival at the facility, contact the person the material is to be received from. In no case will material be received without a representative of the facility being present. If no authorized person is available, call the office (201-664-7070).

2.4.3.2 Don gloves.

2.4.3.3 Inspect drum, noting contents and packaging requirements. If drum does not appear to be packaged according to proper procedures, refuse acceptance and call the office. See Section II-8.0 for packaging procedures.

2.4.3.4 Open and inspect all containers labeled DCS or DCR prior to sealing them for transport. If any item is found not to be "dry", "solid", or "compactible", the container will be refused as a dry solid compactible drum.

2.4.3.5 Check response of the survey meter against the check source provided.

2.4.3.6 Monitor each container with the survey meters. Containers reading in excess of 200 mR/hr at the surface, or 10 mR/hr at one meter, must be repackaged before acceptance.

2.4.3.7 Swipe approximately 300 cm^2 of each container with the filter paper. Read each swipe with the E-120 end window GM counter. Containers with removable contamination in excess of 500 cpm/100 cm^2 must be decontaminated before acceptance. Please note that it is the shipper's responsibility for ensuring that the container is within the DOT limits for removable contamination which are specified in 49 CFR 173.443.

2.4.3.8 Ensure from customer representative that containers are not overloaded. Amount allowed depends on the transport groups. Remember we only handle Type A packages. See Form IWL-RW-209.

2.4.3.9 From the information obtained above, determine the type of labels required (e.g. Class I, II, III; Part 61 Class A,B, or C; STABLE or UNSTABLE; Radioactive LSA; or Radioactive). See Section II-8.2 for external packaging requirements.

2.4.3.10 Ensure that the Radioactive Waste Manifest (RWM) form is properly filled out. Obtain the representative's signature and date the RWM. Sign where indicated, remove customer copy, and return all other copies to Teledyne Isotopes.

2.4.3.11 Obtain properly executed Radioactive Waste Certification Statement (Form IWL-RW-204) from the customer.

2.4.3.12 Label drum. If the drum has not been labeled in accordance with Section II-8.3 (e.g. DCS, VXN, ACR,etc.), do so.

2.4.3.13 Label drum with appropriate NRC Part 61 waste Class obtained from the customer if not already provided.

2.4.3.14 Label drum with mR/hr reading if in excess of 10 mR/hr.

2.4.3.15 Seal containers tightly. If material is either "normal - Type A" or "special" form, incorporate a security seal.

2.4.3.16 Once any radioactive material is placed into the vehicles, all four placards must read RADIOACTIVE. Exception: If all containers have Radioactive I or II labels, security seals and meet DOT 7A type A packaging requirements, or if all the drums on the vehicle are limited quantity.

2.4.4 Transportation

2.4.4.1 Do not leave vehicle except in an extreme emergency. See Section III-2.4.7 through 2.4.9.

2.4.4.2 Follow traffic laws completely. No speeding.

2.4.5 Storage

2.4.5.1 Upon arrival at the warehouse, the containers will be loaded into the warehouse or onto the transport vehicle destined for the disposal facility.

2.4.5.2 Segregate all compactible waste containers and put them into the warehouse on pallets. These wastes are to be compacted when sufficient quantities have been received. Follow special "Procedure for Compacting Radioactive Waste" in Section III-2.4.12.

2.4.5.3 Remove "Radioactive" placards.

2.4.5.4 Monitor warehouse with E-120. No radiation level in excess of 0.5 mR/hr is acceptable at the exterior of the building.

2.4.5.5 Monitor vehicle - See Section 2.7.4.

NOTE: If activity found is in access of the limits specified, notify the Radiation Safety Officer, who will then supervise the decontamination of the vehicle.

2.4.6 Radioactive Waste Pickup Report

Bring all Manifests and Certification Statements to the office and place in the appropriate Radioactive Waste In-Box.

2.4.7 Spillage

2.4.7.1 In case of spillage, prevent further spreading of contamination. This can be accomplished by pouring some "approved" absorbant on any liquid present. Cover to prevent scatter by wind.

2.4.7.2 If spillage occurs within a facility being visited, notify the Radiation Safety Officer or other authorized individual.

2.4.7.3 Notify Teledyne Isotopes at 201-664-7070 and ensure that one of the following is reached:

The Company Health Physicist
The Radiation Safety Officer
The Alternate Radiation Safety Officer
Manager of Radiological Services Department
Chairman of the Radiation Safety Committee

If the office is closed for the day, use the home phone numbers found in Section II-3.4.

2.4.7.4 At least one person should be stationed at the site to keep unauthorized personnel away from the contaminated area.

2.4.8 Vehicle Breakdown

2.4.8.1 In the event a breakdown occurs while the vehicle is transporting radioactive materials, accomplish the following in the order given:

Place one red reflective triangle at each of the following locations:

100 feet behind the vehicle in the center of the lane the vehicle occupies.

100 feet in front of the vehicle in the center of the lane the vehicle occupies.

10 feet in front or back of the vehicle on the traffic side.

2.4.8.2 Notify the local police. This can be done by stopping a passing motorist and having him notify the police. Make sure they give the police a detailed description of where the breakdown occurred.

2.4.8.3 The driver will not leave the vehicle unattended unless in an extreme emergency in which case the vehicle will be locked and the wheels should be chocked to prevent movement.

2.4.8.4 Notify Teledyne Isotopes. See Section 2.4.7.3.

2.4.8.5 If necessary, another vehicle will be dispatched to the scene of the breakdown an the radioactive material will be transferred to the replacement vehicle for transportation to the warehouse.

2.4.8.6 The disabled vehicle will then be towed to a garage for repairs.

2.4.9 Vehicle Accident

In the event an accident occurs, accomplish the following in the order given:

2.4.9.1 Exit the cab of the vehicle and take the Radioactive Waste Manifest Forms with you.

2.4.9.2 Assist any injured.

2.4.9.3 Isolate the area. If you can prevent the spreading of contamination, do so.

2.4.9.4 Notify Teledyne Isotopes as in Section 2.4.7.3.

2.4.9.5 Advise police and/or firemen of load contents.

2.4.9.6 The Radiation Safety Officer will take appropriate actions based on the situation. These actions might be any of the following if required

Determine the extent of damage and the hazards involved.

Direct removal of any radioactive materials involved.

Monitor the area to determine the extent of any contamination.

Direct decontamination operations if required.

Direct removal of vehicle.

Assist police and/or firemen in any way possible.

Notify NRC or State Offices as soon as possible.

Notify American Nuclear Insurers at 203-677-7715.

2.4.10 General Responsibilities

It will be the responsibility of each individual to notify his supervisor, in writing, immediately upon observing any situation or action which could be instrumental in causing an accident or incident of any kind. In an extreme emergency the vehicle should be driven to the nearest dealer and any repairs needed should be performed.

2.4.11 Special Procedure: Shipping Radioactive Waste to US Ecology in Richland, Washington

2.4.11.1 Prior Notification

- Request Tri-State Motor Transit (TSMT) to supply vehicle.

  State date, time, place and destination

  Telephone: 800-641-7591

- Notify the State of New Jersey

  State when, what carrier, route, curies and primary isotopes.

  Telephone: 609-292-5586.

Exception: All shipments under 20 curies total are exempt from this requirement.

2.4.11.2 Loading and Monitoring the Vehicle

- Use Form IWL-RW-210, "Radioactive Waste Shipment Checklist (RWSC)", when loading the vehicle. Note the last three digits (e.g. Trailer No. 440123, note #123) on the copies of the Radioactive Waste Manifest (RWM) forms.
- Follow the general radiation safety procedures outlines in Section II of the Radiation Protection Manual during all loading and unloading operations.
- Ensure all placards are in place.
- Ensure load is braced and secured.

2.4.11.3 Compilation of Shipping Papers & Release of Shipment

- Before carrier arrives:

  Using the Radioactive Waste Shipment Checklist, compile all the RWM forms on the load. Number each consecutively, enter date of shipment, carrier, and shipper's number.

  Tally all RWM forms thus completed on Shipment Record Form IWL-RW-212.

  Using totals figures on IWL-RW-212 forms, fill out Bill of Lading.

  Separate the transporter copy from all completed RWM forms and discard.

  Fill out four (4) State of Washington Certifications (Form IWL-RW-215) and have R.S.O. or other authorized individual approve each.

  Fill out one (1) Statement of Certification for the shipment. Make three (3) copies and attach one to each of the four (4) State of Washington Certification.

* After the carrier arrives:

Have the driver inspect the load for bracing and attach security seals to all access doors. Note on the "Exclusive Use Statement" and the "Bill of Lading" the Security Seal Numbers which are used. Make two copies.

Using Forms IWL-RW-201 and IWL-RW-202, monitor the vehicle and record readings.

Have the driver remove the filled trailer and replace with the empty trailer.

Have the driver sign four (4) copies of the State of Washington Certification (Form IWL-RW-215), the Bill of Lading and each Manifest where indicated.

Complete the Bill of Lading using information supplied by the driver:

Complete "Exclusive Use Statement".

2.4.11.4 Give the following items to the T.S.M.T. driver for T.S.M.T.:

Original Bill of Lading
Original of "Exclusive Use Statement" (IWL-RW-214)
One copy of the Manifests
Original of Forms IWL-RW-201 and IWL-RW-202.
Two originals of State of Washington Certification with Statement of Certification attached. (Forms IWL-RW-215 and IWL-RW-227)

2.4.11.5 Give the following items to the T.S.M.T. driver for US Ecology:

Bill of Lading "This Memorandum"
Copy of "Exclusive Use Statement" (IWL-RW-214)
Two original white copies of Manifests
Copies of Forms IWL-RW-201 and IWL-RW-202
One original of State of Washington Certification with Statement of Certification attached (Forms IWL-RW-215 and IWL-RW-227)

2.4.11.6 Teledyne Isotopes -- retain the following items for our records:

Bill of Lading "This Shipping Order"
Copy of "Exclusive Use Statement" (IWL-RW-214)
Copies of Manifests
Copies of Forms IWL-RW-201 and IWL-RW-202
One original of State of Washington Certification with Statement of Certification attached (Forms IWL-RW-215 and IWL-RW-227)
Copy of Burial Verification Certification (IWL-RW-230)

2.4.11.7 Final Notification

Notify US Ecology of date of shipment, expected date of arrival, vehicle number, trailer company, freight bill number, shipper's number, drivers' names and carrier (TSMT).

Mail the fourth set of Manifests to US Ecology in order to comply with the notification requirements.

2.4.11.8 Inventory

Enter the shipment portion of the radwaste inventory program and "ship out" all drums on the shipment.

2.4.12 Procedure for Compacting Waste

2.4.12.1 Description

The system consists of the Compacting Chamber, Control Panel, Air Exhaust & Filter System, Air Sampling System and Air Supply System. A diagram of our warehouse at 103 Woodland Avenue, Westwood, New Jersey is shown in Figure III-2.1. A list of the equipment is as follows:

I. Compactor: Model 55AR-P RAM Flat with 21 CH compaction head and pneumatic controls - NEMA 4 Control Cabinet and explosion-proof motor, from S & G Enterprises

II. Air Filter: Model CRN Air System from S & G Enterprises

III. Air Supply System:

Series 605041 Portable Air Compressor and
Series 605003 Zephyair NIOSH Approved Constant flow compressed air masks.

IV. Air Sampling System:
Model AMS-3 with RAP-1 regulated pump from Eberline Corporation.

(NOTE: If the equipment listed is found to be unavailable, equivalent systems will be substituted.)

2.4.12.2 Waste

The waste to be compacted will be found in the area designated by floor markings in drums labeled DCS and DCR. Double check for labeling prior to opening drum.

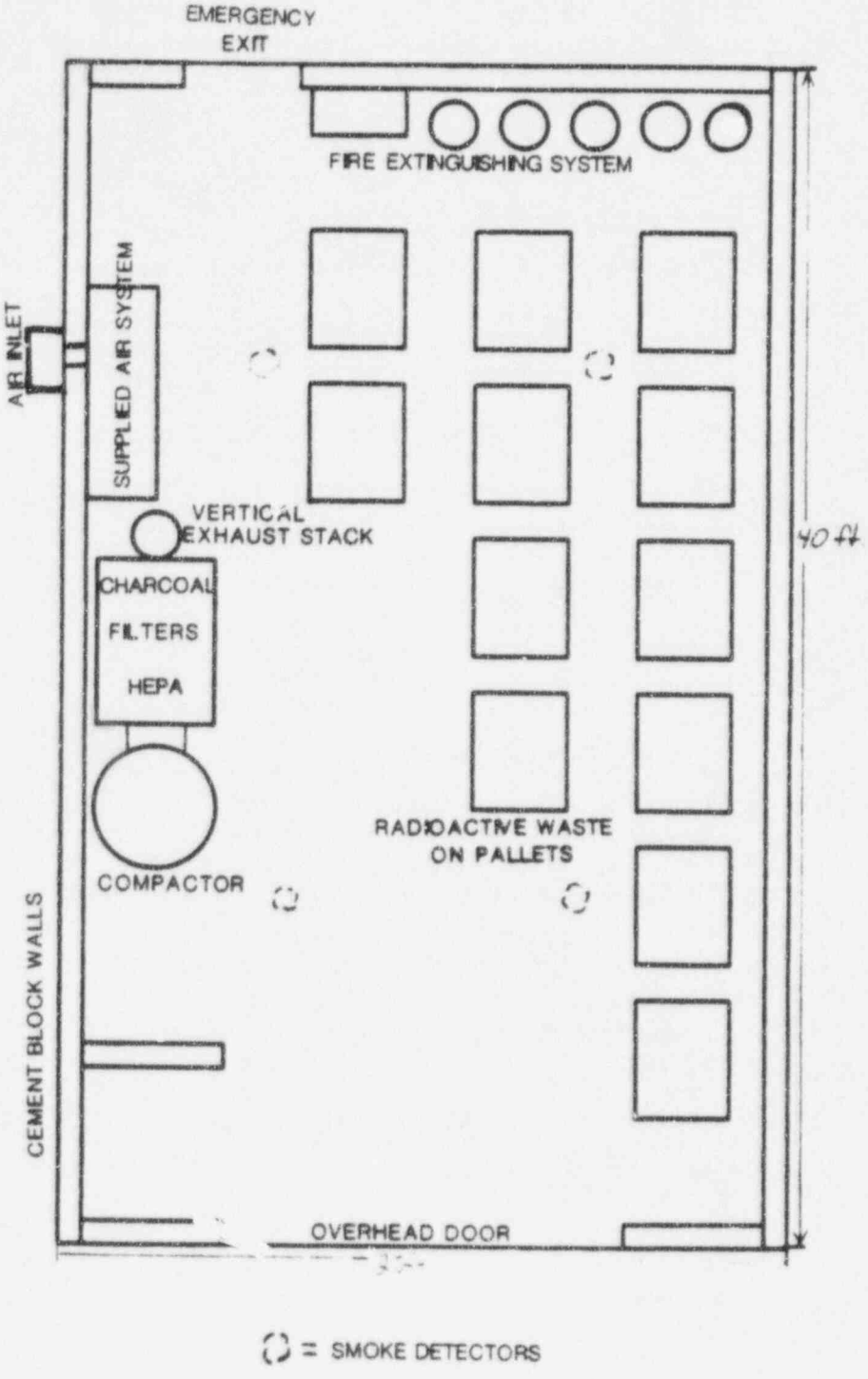
2.4.12.3 Procedure

1) Put on protective clothing: disposable coveralls, rubber boots and/or shoe covers, and vinyl gloves.

2) Turn on air supply system and put on respirator.

3) Select a DCR or DCS container.

Figure III-2.1



4) Inspect container for deformations, rust and holes. Any drum found unsatisfactory will not be used for compaction.

5) Place container onto drum dolly.

6) Remove cover.

7) Place into compaction chamber and close door.

8) Turn ON air sampling system and let it run until all compactions for the day are completed.

9) Turn ON compactor and let it cycle.

10) Enter on RadWaste Composite Compaction List (Form IWL-RW-216) the drum identification and generator id number.

11) Upon completion of cycle, select a new container and open.

12) Remove waste intact in the double 4 mil liners and place into the drum which is already in the compactor.

NOTE: If the waste from the new drum cannot all be compacted in the compacted drum, do not compact any additional waste into that drum. Seal the drum and select another drum in which to compact.

13) Continue with Step 9 until you have completed a drum.

14) Once all such drums have been compacted, all empty containers shall be swipe tested thoroughly inside and out. The swipes shall be analyzed for contamination by analysis appropriate for the isotopes contained.

15) Drums found to be clean shall have all markings and labels removed and put back into service. All drums which are found to be contaminated shall be decontaminated and resurveyed. The limits for contamination are as detailed in the US Nuclear Regulatory Commission's publication on the Decontamination of Facilities and Equipment prior to Release for Unrestricted Use or Termination of License for Byproduct, Source or Special Nuclear Material.

16) The decontamination area will consist of an area designated in the warehouse adjacent to the compaction area. It will have strippable paint applied to the surface which will be surveyed after each decontamination. Acceptable levels are as follows:

Fixed activity limits:

- Gross Alpha - 0.5 mR/hr at contact
- Gross Beta - 0.5 mR/hr at contact

Removable activity limits:

- Gross Alpha - 100 dpm/100 cm^2
- Gross Beta - 500 dpm/100 cm^2
- Tritium - 1000 dpm/100 cm^2

17) Drums which have been completely compacted will be prepared for shipment. They will either be stored in the warehouse or loaded onto the transport vehicle.

18) General Notes:

- Only the compacted drum and one (1) other drum will be opened at any one time.
- If a drum interior cannot be decontaminated to the designated levels, it will be used as a compaction drum.
- There should be little chance of contamination as the waste will be contained within 8 mil of plastic (two 4 mil liners)
- The air will be monitored continuously by the use of the Eberline AMS-3 air monitoring system during all compaction operations.
- Any changes made concerning supplied air must be approved by the US Nuclear Regulatory Commission.
- Filters will be changed on the CRN filter system at intervals recommended by the manufacturer or at intervals indicated by monitoring results.
- The filter system is set up to exhaust to the outside of the building.
- If there is any indication that a container has broken bags or other unsafe conditions, it will be resealed and shipped for burial as either a DMS or DMR drum.
- Any decontamination materials will be placed in to 4 mil plastic bags and stored in a 30 gallon container for compaction at some future time.
- For training, see Section III-2.3.13.

III-2.5 *Procurement of Supplies Related to Radioactive Waste Disposal*

The objective of this program is to assure that the materials and equipment meet with the specifications required by the NRC, DOT and/or burial site. Verification that what was ordered was actually received is performed by signing for the material on the packing slip which accompanies the shipment.

2.5.1 The drums are to be in compliance with DOT specification 7A. All drums ordered must be DOT 17H, DOT 17C, or DOT 6J. This is referenced on the Purchase Order and a copy of the same is to be kept on file by the Manager of the Radiological Services Department.

2.5.2 The absorbant used is one which is approved by the State of Washington for use at the US Ecology burial facility.

2.5.3 The poly liners ordered are to be a minimum of 4 mils thick. This is to be referenced on the Purchase Order, a copy of which is to be kept on file by the Manager of the Radiological Services Department.

III-2.6 *Management - Controlled Audits of Radioactive Material Packaging and Transport Activities*

Audits are required to maintain control and monitor compliance with company policy and regulatory agencies. Included in this Section are standardized auditing forms to comply with the auditing requirements.

2.6.1 These audits will be performed annually for each licensed activity which generates radioactive waste for disposal.

2.6.2 These audits will be performed by a sub-committee appointed by the the Chairman of the Radiation Safety Committee, comprised of at least two of the following:

* Dr. D. F. Schutz, Chairman, Radiation Safety Committee
* The Radiation Safety Officer
* The Alternate Radiation Safety Officer
* Any member of the Radiation Safety Committee

2.6.3 A checklist (Form IWL-RW-228) will be completed by the committee during a meeting with the manager or supervisor of the area of activity. The checklist is designed to establish quality assurance for:

* Documentation
* Training and Supervision
* Operating Procedures
* Working Conditions

2.6.4 Based on the entries on Form IWL-RW-228, an Evaluation of Audit (Form IWL-RW-229) is then completed. Actions required, actions completed, acceptance of audit, etc. are documented and then reviewed by the Radiation Safety Committee if appropriate.

2.7.1 Warehouse Survey - The warehouse is to be surveyed for both direct radiation levels and removable contamination approximately once each week. See limits for contamination listed in Section III-2.7.3. In addition to this routine survey, anytime a drum which has a radiation level in excess of 10 mR/hr at the surface is placed into the warehouse, an additional survey will be performed to determine that the radiation levels at the exterior of the building do not exceed 0.5 mR/hr @ six (6) inches.

2.7.2 Warehouse Air - The warehouse air will be sampled whenever compaction is being done. It will be analyzed for I-125, I-131, H-3, C-14, Gross Alpha and Gross Beta, if applicable. A sampler equipped with a charcoal filter, a millipore filter, and a bubbler will be used when required.

Air sampling will be performed at two locations: 1) in the vertical exhaust stack and 2) in the area the operator will usually occupy. The air sample for the effluent will be made by means of inserting copper tubing into the compactor exhaust duct after the filter, and making a downward bend. The average stack velocity (ASV) will be determined using the "center of equal area" technique. The tube will be placed at a point equalling the ASV. Using the ASV, the volume flow (CFM), and the velocity of the air sampling pump, the inside diameter of the sampling tube head will be determined. Note: based on an ASV of 800 CFM, a duct of 9" diameter and sampling pump rate of 1 CFM, the inside diameter of the sample tube would be approximately 5/16".

For the personnel sampler, sufficient volume flow will be used to detect, at a minimum, 10% of the values found in 10CFR Part 20 Appendix B for the major isotopes present. The instruments used to count the samples are Eberline models SAC-4 and MS-2, and Intertechnique Model SL-30. The SAC-4 alpha scintillation counter will be used for gross-alpha, the MS-2 gas proportional counter for gross beta, and the SL-30 liquid scintillation counter for C-14 and H-3. The charcoal tube will be analyzed for radioactive iodines by Teledyne Isotopes radiochemistry lab. All instruments are calibrated using standard sources traceable to the National Bureau of Standards (NBS).

2.7.3 Environmental Monitoring - Environmental TLD's are placed on the fence surrounding the building on each side at the closest point to the warehouse. These are evaluated every 3 months.

2.7.4 Vehicle Surveys - Vehicles used to transport radioactive material will be surveyed at least monthly for both direct and removable contamination. Limits are as follows:

Fixed:

Gross Alpha - 0.5 mR/hr @ 1 cm
Gross Beta - 0.5 mR/hr @ 1 cm

Removable:

Gross Alpha - 100 dpm/100 cm^2
Gross Beta - 500 dpm/100 cm^2
Tritium - 1000 dpm/100 cm^2

III-2.8 *Operation of Automatic Fire System at Radioactive Storage Warehouse*

2.8.1 In the event of fire or smoke detection, the following sequence of events will occur:

2.8.1.1 Alarms inside and outside will ring.

2.8.1.2 The warehouse door will close, the natural gas supply to the heat will be cut off, and exhaust fan will stop operating.

2.8.1.3 Approximately 40 seconds time will elapse before CO2 is released to extinguish fire.

2.8.1.4 The fire department is notified.

2.8.2 In the event that you are in the warehouse when the alarm sounds you should do one of the following:

2.8.2.1 Go to the emergency exit located at the left rear corner of the warehouse and;

2.8.2.2 If you suspect that there is a fire, exit immediately and;

2.8.2.3 Wait to direct fire department and notify the safety officer or company operator as soon as possible.

2.8.3 If the system has been inadvertently triggered by smoke from a vehicle you can stop the system CO2 release by:

2.8.3.1 Moving the timer control switch from "normal" to "hold " on box #2. The hold switch will hold the system indefinitely and reset the timer to 40 seconds.

2.8.3.2 Slide the reset button in box #1 to the reset position. Alarm switch to silence.

2.8.3.3 When the alarm stops you can now move the "hold " switch to "normal " and the "alarm" switch to "normal". The system is now reset.

2.8.3.4 Call the police to cancel the false alarm.

2.8.4 SPECIAL NOTES:

2.8.4.1 Never park any of the diesel powered vehicles close to the warehouse door with the engine operating, this has been know to trigger the system.

2.8.4.2 If a fire is detected and the system does not function, there is a manual pull station located on the outside wall of the warehouse on the right side. The system will follow the same sequence as above.

2.8.4.3 Should the system become operational while you are outside of the warehouse, do not enter for any reason.

2.8.4.4 Police: 664-7000
2.8.4.5 Fire: 664-7007

RSC/QCM 4.80

	Date	Approved
Rev'd:		
Revs'd:		

III-2.9 *Forms Used in Describing and Controlling Radioactive Waste*

DESCRIPTION	FORM NO.	ACTION
Certification of Radiation Survey	IWL-RW-201	Issued 3/80
Diagram of Survey Area (Truck)	IWL-RW-202	Issued 3/80
Radioactive Waste Delivery/Pickup Form	IWL-RW-203	Issued 3/80
Radioactive Waste Certification Statement	IWL-RW-204	Issued 3/80
Retraining of Personnel Regarding Processing of Generated Waste	IWL-RW-206	Issued 3/80
Checklist for Radioactive Waste Pickup	IWL-RW-207	Issued 3/80
Retraining DOT, NRC	IWL-RW-208	Issued
Radioactive Waste Shipment Checklist	IWL-RW-210	Issued 7/80
Shipment Record	IWL-RW-212a	Revised 6/88
Exclusive Use Statement	IWL-RW-214	Issued
State of Washington Certification	IWL-RW-215	Issued 6/80
RadWaste Composite Compaction List	IWL-RW-216	Issued 7/82
Application for Employment	IWL-RW-217	Issued 4/80
Statement of Violations	IWL-RW-218	Issued 4/80
Inquiry to State Agency	IWL-RW-219	Issued 4/80
Written Examination for Drivers (DOT) pg. 1-4	IWL-RW-220	Issued 4/80
Certification of Written Examination	IWL-RW-221	Issued 4/80
Driver Road Test	IWL-RW-222	Issued 4/80
Physical Examination	IWL-RW-223	Issued 4/80
Physical Certification	IWL-RW-223	Issued
Radioactive Waste Procedures Exam - 3 pages	IWL-RW-224	Issued 4/80
Annual Review of Driving Record	IWL-RW-225	Issued 4/80
Statement of Certification	IWL-RW-227	Issued 7/82
RAM Packaging & Transportation Audit Checklist	IWL-RW-228	Issued 12/80
Review & Evaluation of Radioactive Materials Activities Audit	IWL-RW-229	Issued 12/80
Burial Certification	IWL-RW-230	Issued 11/81
Packaging of Radioactive Waste Examination 2 pages	IWL-RW-231	Issued
User Request Form	IWL-HP-06	Issued 4/80
HP Basic Training Record	IWL-HP-07	Issued 4/80

RSC/QCM 4.80

	Date	Approved
Rev'd:		
Revs'd:	3/3	3/88

TELEDYNE ISOTOPES

CERTIFICATE OF RADIATION SAFETY SURVEY

THIS IS TO CERTIFY THAT A SURVEY WAS PERFORMED TO DETERMINE RADIATION LEVELS AND FOR COMPLIANCE WITH U.S. DOT AND U.S. NRC REQUIREMENTS

Location: _____

_____

_____

_____

Date of Survey: _____

Surveyed By: _____

Survey Instrument: _____

Serial Number: _____

Calibrated on: _____

(Note: See diagram of surveyed area for results of the survey.)

TELEDYNE ISOTOPES

Approved: _____

Title: _____

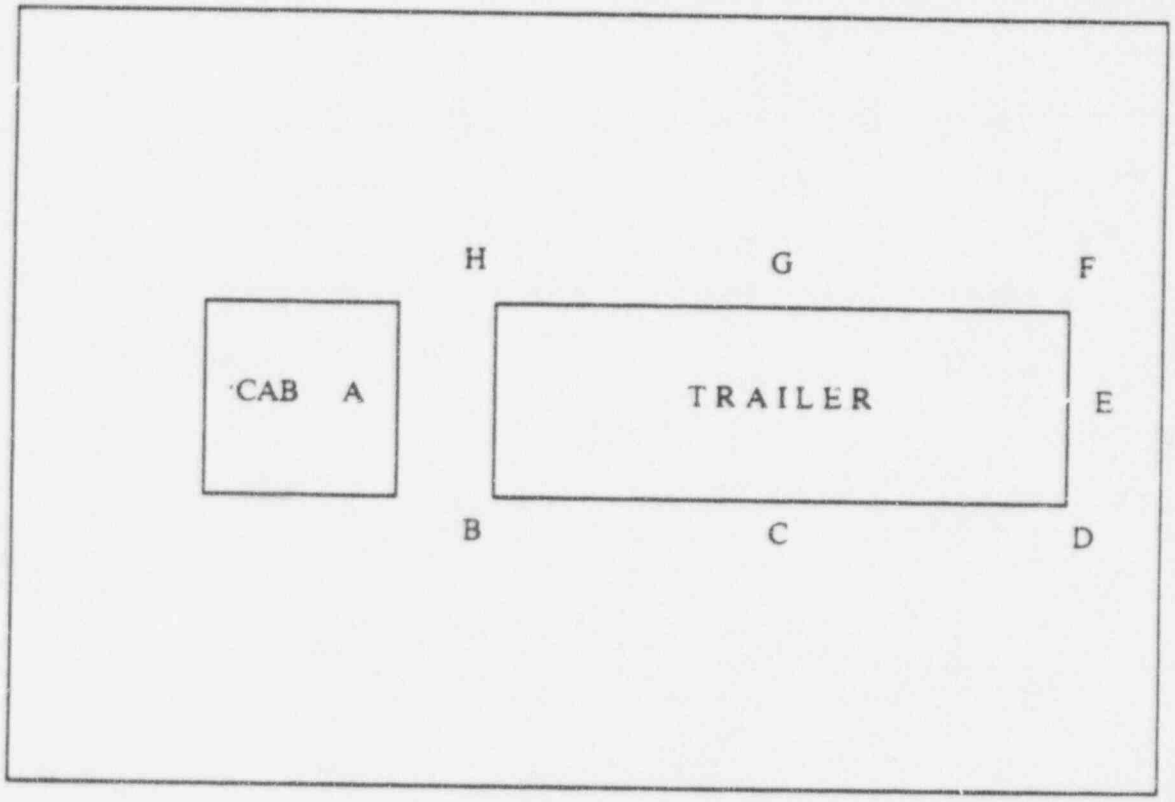
Date: _____

TELEDYNE ISOTOPES

DIAGRAM OF SURVEYED AREA

Carrier: _____

Date: _____



RESULTS

Location	mR/hr @ contact	mR/hr @ 1 meter
A in cab		
B		
C		
D		
E		
F		
G		
H		

TELEDYNE ISOTOPES

DATE: _____ DATE COMPLETED: _____

CUSTOMER: _____ USER PERMIT: _____

_____ GENERATOR #: _____

_____ PO NUMBER: _____

_____ TELEPHONE #: _____

_____ BUILDING #: _____

CONTACT: _____ ROOM #: _____

DELIVER		PICKUP	
5-gal pail		5-gal pail	
30-gal drum		30-gal drum	
55-gal drum		55-gal drum	
55-gal ACR		crates	
55-gal LVR		SPECIAL INSTRUCTIONS	
55-gal 'S' drums			
55-gal 'V' drums			
5-gal liners			
30-gal liners			
55-gal liners			
Security Seals			
Absorbant			
Labels			
Rings (size)			

Form TWL-RW-203 revised 1/88

TELEDYNE ISOTOPES

ATTACHMENT A

RADIOACTIVE WASTE CERTIFICATION STATEMENT

Certification is hereby made that the containers identified on the Radioactive Waste Shipping Manifest listed below have been packaged and labelled in accordance with Teledyne Isotopes' Radioactive Waste Disposal Agreement and Teledyne Isotopes' packaging instructions dated 8/87.

Facility: _____

Printed Name: _____

Signature: _____

Title: _____

Date: _____

Radioactive Shipping Manifests:	US DOT Proper Shipping Name:

Form IWL-RW-204 issued 3/80; revised 12/87

TELEDYNE ISOTOPES

RETRAINING OF PERSONNEL
REGARDING PROCESSING OF GENERATED WASTE

DATE: / / INSTRUCTOR:

ATTENDEES: _____

_____

_____

_____

_____

SUBJECT OUTLINE:

IWL-RW-206

Revised 8/88

RSC/QCM 4.80

	Date	Approved
Rev'd:		
Revs'd:	8/88	

TELEDYNE ISOTOPES

CHECKLIST FOR RADIOACTIVE WASTE PICKUP

Table A

Health Physics Equipment

1) TLD Badge
2) GM Survey Meters:
   1 - 50 mR/hr range with thin end window (e.g. E-120)
   1 - 1000 mR/hr range (e.g. E-130G)
3) Filter papers or other absorbant paper

Table B

Department of Transportation Equipment

1) Driver's Log Book
2) Radioactive Waste Delivery/Pickup Forms
3) Radioactive Waste Manifest Forms
4) Appropriate maps
5) Work gloves
6) Miscellaneous equipment (e.g. Security Seals, ratchet wrench, waste manifest forms, screwdriver, portable 5-gallon pail sealing tool, labels: Rad I, II, and III, Flammable Liquid, etc., cash, credit cards, nuts, bolts, marker, pens, etc.).

TELEDYNE ISOTOPES

RETRAINING OF PERSONNEL REGARDING NRC, D.O.T., WASTE BURIAL REQUIREMENTS

DATE: / / INSTRUCTOR:

ATTENDEES: _____

_____

_____

_____

_____

_____

_____

_____

SUBJECT OUTLINE:

RSC/QCM 4.80

	Date	Approved
Rev'd:		
Revs'd:	5/88	

ISOTOPES

RADIOACTIVE WASTE SHIPMENT CHECKLIST

DRUM ID # (RADR#)	RING & BOLT SECURED & THREAD INTERRUPTED	LABELED OR MARKED (RAD I, II, III LSA, etc.)	ID # (RADR#) DURABLY & LEGIBLY MARKED	mR/hr READINGS ACCURATE	CONTAMINATION (dpm/100 cm^2) ACCURATE	LOADED ON TRUCK (Trailer No.)

Shipment #_____ SHIPMENT RECORD FORM page _____ of _____ pages

MANIFEST	PG	5	30	55	OTHER	UN #	H-3	C-14	Tc-99	I-129	SNM gms	S. kgs	Total mCi

Form IWL-RW-212a issued 3/88

TELEDYNE ISOTOPES

EXCLUSIVE USE STATEMENT

T.I. Shipment No._____ Trailer No._____

This vehicle is consigned exclusive use. Loading and unloading of contents must be conducted by the consignor or the consignee or his designated agent. Any shifting of the load must be approved by the undersigned prior to movement. Placards have been applied and are not to be altered under any condition. Any change of equipment requires notification of the undersigned prior to movement of the vehicle.

IN AN EMERGENCY:

During office hours: Call 201-664-7070 (8:00 a.m. to 5:00 p.m. EST) Ask for Steven Black or Hector Martos.

After hours: Call TSMT Radioactive Dispatch @ 800-641-7580. They will contact us.

The Security Seal numbers used on this shipment are TI_____.

If there are any discrepancies upon arrival at destination, please notify us.

Thank you.

TELEDYNE ISOTOPES

SAB:jk

Steven A. Black, R.S.O.

Form IWL-RW-214 Revised 1/21/85

WASHINGTON STATE DEPARTMENT SOCIAL & HEALTH SERVICES

DEPARTMENT OF SOCIAL AND HEALTH SERVICES
OLYMPIA, WASHINGTON

LOW-LEVEL RADIOACTIVE WASTE SHIPMENT CERTIFICATION FOR
COMMERCIAL GENERATOR/PACKAGERS, AND BROKERS AND CARRIERS

The following certification, completed as applicable, is made to the State of Washington:

Certification is hereby made to the State of Washington that Radiation Shipment Record No. _____ of low-level radioactive waste has been inspected in accordance with requirements of the Governor of Washington's Executive Order dated November 19, 1979, prior to its shipment. Further certification is made that the inspection has revealed no items of noncompliance with all applicable laws, rules and regulations.

The undersigned shall indemnify and hold harmless the State of Washington, in an amount not to exceed $1,000,000.00 per individual who may be injured, provided that indemnification shall not exceed $5,000,000.00 in total, for each occurrence, from any and all claims, suits, losses, damage, injury and expenses to any person whomsoever or to property arising or growing out of or in any manner connected with the activities performed under this order.

Except for any violation of applicable existing state or federal statute or regulation respecting packaging and shipment, inspection and acceptance of any item, or container or material covered by this certification by the State of Washington or a duly authorized contractor shall release the party who executed this certificate from any and all requirement of indemnification from injury or loss.

SECTION A:
FOR THE GENERATOR/PACKAGER: TELEDYNE ISOTOPES (See attached sheet)
(Company Name)

PERMIT NUMBER: 6870

VOLUME OF WASTE IN THIS SHIPMENT: _____ cubic feet

DATE: _____ BY: _____

TITLE: _____

SECTION B:
FOR THE BROKER: TELEDYNE ISOTOPES
(Company Name)

PERMIT NUMBER: 6870

VOLUME OF WASTE IN THIS SHIPMENT: _____ cubic feet

DATE: _____ BY: _____

TITLE: _____

SECTION C:
FOR THE CARRIER: TRI STATE MOTOR TRANSIT
(Company Name)

VOLUME OF WASTE IN THIS SHIPMENT: _____ cubic feet

DATE: _____ BY: _____

TITLE: _____

DSHS RHF-31A
DSHS 13-424 (1/80)

Form No. IWL-RW-215 revised 6/80

RAD WASTE COMPOSITE COMPACTION LIST

Compaction Container ID	Original Container ID	Generator ID Number	Date Compacted

Technician _____

Date Signed _____

Logged By _____

Date Logged _____

IWL-RW-216 Issued: 07/82

For Personnel Department Use Only

Position(s) Applied For Is Open: ☐ Yes ☐ No

Date_____

List below all accidents you were involved in during the last 3 years:

Date	Nature of Accident	Fatalities	Personal Injury

List the valid vehicle licenses in your possession:

Chauffer's License: Issued by state of_____ Number_____ Expires_____
Operator's License; Issued by state of_____ Number_____ Expires_____
Driver's License: Issued by state of_____ Number_____ Expires_____

Have you ever lost your driving privileges? Explain_____

MOTOR VEHICLE DRIVER'S CERTIFICATION

I certify that the following is a true and complete list of traffic violations (other than parking violations) for which I have been convicted or forfeited bond or collateral during the past 36 months.

Date	Offense	Location	Type Vehicle Operated

If no violations are listed above, I certify that I have not been convicted or forfeited bond or collateral on account of any violation required to be listed during the past 36 months.

_____ DATE OF CERTIFICATION

_____ DRIVER'S SIGNATURE

_____ MOTOR CARRIER'S NAME

_____ MOTOR CARRIER'S ADDRESS

_____ REVIEWED BY: SIGNATURE

_____ TITLE

EMPLOYMENT DESIRED: Position_____ Date you can start_____

Salary_____ Are you employed now?____ If so, may we inquire of present employer?_____ We may contact prior employers as required by 391.23 (US DOT).

Experience: (Explain experience you have for the above desired position. If you operated motor vehicle equipment explain types and states driven in.

Do you have full knowledge of the Federal Safety Requirements?_____

Form IWL-R2-217 issued: 3/80

detach

TELEDYNE ISOTOPES

STATEMENT OF VIOLATIONS

(TO BE COMPLETED PRIOR TO HIRING AND ANNUALLY)

I certify that the following is a true and complete list of traffic violations (other than parking violations) for which I have been convicted or forfeited bond or collateral during the past 12 months.

Date	Offense	Location	Type of Vehicle Operated

If no violations are listed above, I certify that I have not been convicted or forfeited bond or collateral on account of any violation required to be listed during the past 12 months.

Date of Recertification

Driver's Signature

Motor Carrier's Name

Motor Carrier's Address

Reviewed by: Signature

Title

TELEDYNE ISOTOPES

INQUIRY TO STATE AGENCY FOR DRIVER'S RECORD

_____
(Driver's Name)

_____
(Driver's Operators Lic. No.)

_____
(Driver's Social Sec. No.)

Dear Sir:

The above listed individual has made application with us for employment as a driver. He has indicated that the above numbered operators license or permit has been issued by your State to him and that it is in good standing.

In accordance with Section 391.23 (a) (1) and (b) of the Federal Motor Carrier Safety Regulations we are required to make inquiry into the driving record during the preceeding 3 years of every State in which an applicant-driver has held a motor vehicle operations license or permit during those three years.

Therefore, please certify to us what the individual's driving record is for the preceeding 3 years, or certify that no driving record exists if that be the case.

In the event that this inquiry does not satisfy your requirements for making such inquiries, please send us such forms of yours as are necessary for us to complete our inquiry into the driving record of this individual.

Respectfully yours,

_____
Signature of individual making inquiry

_____
Motor Carrier Name Street City State Zip

_____ _____
Name of person Making inquiry Title

FORM IWL-RW-219 ISSUED 4/1/80

REV KFF 10/1/76

Appendix C—Written Examination For Drivers

Instructions

All of the questions contained herein are based on the United States Department of Transportation's Federal Motor Carrier Safety Regulations. Applicants for the position of commercial driver are required to take the examination.

Each question has four answers but only one is right. Your job on each question is to read all of the answers and then to pick the one answer you think is right. Mark an "X" in the space next to the answer you choose. Do not pick more than one answer for each question.

Here is a sample question to show you what is to be done.

The Federal Motor Carrier Safety Regulations were written for:

1. ( ) vehicle makers.
2. ( ) drivers only.
3. ( ) carriers only.
4. ( ) drivers and carriers.

The right answer is number 4, "drivers and carriers," so you would mark an "X" in the space next to answer number 4.

Finally, be sure to answer every question and do not skip any pages. Keep in mind that most of the Regulations covered here are different from what is required of passenger car drivers; they apply to commercial bus and truck drivers. Again, pick only one answer for each question. There is no time limit on the examination, but try to work as fast as you can.

1. 390.32 A motor carrier who is also a driver (owner-operator):

1. ( ) is not covered by the safety regulations.
2. ( ) must obey only those parts of the regulations which cover drivers.
3. ( ) must obey only those parts of the regulations which cover motor carriers.
4. ( ) must obey both the parts covering drivers and the parts covering motor carriers.

2. 391.11(b)(1) With only a few exceptions, the Federal Motor Carrier Safety Regulations say a driver must be:

1. ( ) at least 18 years old.
2. ( ) at least 19 years old.
3. ( ) at least 20 years old.
4. ( ) at least 21 years old.

3. 391.15(c)(2)(3) A driver cannot drive a motor vehicle:

1. ( ) For one year after a first offense conviction for a felony involving a commercial motor vehicle he was driving.
2. ( ) For one year after a first offense conviction for driving a commercial vehicle under the influence of alcohol or narcotics.
3. ( ) For one year after a first offense conviction for leaving the scene of an accident which resulted in personal injury or death.
4. ( ) For one year after a first offense conviction for any of the above.

4. 391.21(b)(7)(8)(10) Every driver applicant must fill out an application form giving:

1. ( ) a list of all vehicle accidents he was in during the previous 3 years.
2. ( ) a list of all of his motor vehicle violation convictions and bond forfeits (except for parking) during the previous 3 years.
3. ( ) a list of names and addresses of all of his employers during the previous 3 years.
4. ( ) all of the above.

5. 391.27(a)(b) At least once a year, a driver must fill out a form listing all motor vehicle violations (except parking) which he had during the previous 12 months. He must fill out the form:

1. ( ) even if he had no violations.
2. ( ) only if he was convicted.
3. ( ) only if he was convicted or forfeited bond or collateral.
4. ( ) only if the carrier requires it.

6. 391.33(a)(2) If a driver applicant has a valid certificate showing he passed a driver's road test:

1. ( ) the carrier must accept it.
2. ( ) the carrier may still require the applicant to take a road test.
3. ( ) the carrier cannot accept it.
4. ( ) the carrier may request a road test waiver from the Bureau of Motor Carrier Safety.

7. 391.41(b)(5) Persons with breathing problems which may affect safe driving:

1. ( ) cannot drive.
2. ( ) cannot drive unless the vehicle has an emergency oxygen supply.
3. ( ) cannot drive unless another driver is along.
4. ( ) cannot drive except on short runs.

8. 391.41(b)(7) Persons with arthritis, rheumatism, or any such condition which may affect safe driving:

1. ( ) cannot drive unless they are checked by a doctor before each trip.
2. ( ) cannot drive.
3. ( ) cannot drive except when they are free of pain.
4. ( ) cannot drive unless another driver is along.

9. 391.41(b)(8) Persons who have ever had epilepsy:

1. ( ) cannot drive unless another driver is along.
2. ( ) cannot drive.
3. ( ) cannot drive on long runs.
4. ( ) cannot drive without monthly medical examinations.

10. 391.41(b)(9)(12)(13) In order to be able to drive, a person:

1. ( ) must not have any mental, nervous or physical problem likely to affect safe driving.
2. ( ) must not use an amphetamine, narcotic or any habit-forming drug.
3. ( ) must not have a current alcoholism problem.
4. ( ) must not have or use any of the above.

11. 391.45(c) Any driver who gets an injury or illness serious enough to affect his ability to perform his duties:

1. ( ) must report it at his next scheduled physical.
2. ( ) cannot drive again.
3. ( ) must take another physical and be recertified before driving again.
4. ( ) must wait at least 1 month after recovery before driving again.

12. 392.2 A driver may not drive faster than posted speed limits:

1. ( ) unless he is sick and must complete his run quickly.
2. ( ) at any time.
3. ( ) unless he is passing another vehicle.
4. ( ) unless he is late and must make a scheduled arrival.

13. 392.3 When a driver's physical condition while on a trip requires that he stop driving, but stopping would not be safe, the driver:

1. ( ) must stop anyway.
2. ( ) may try to complete his trip, but as quickly as possible.

3. ( ) may continue to drive to his home terminal.
4. ( ) may continue to drive, but must stop at the nearest safe place.

14. 392.5(a)(1) A driver may not drink or be under the influence of any alcoholic beverage (regardless of alcoholic content):
1. ( ) within 4 hours before going on duty or driving.
2. ( ) within 6 hours before going on duty or driving.
3. ( ) within 8 hours before going on duty or driving.
4. ( ) within 12 hours before going on duty or driving.

15. 392.7 A driver must satisfy himself that service and parking brakes, tires, lights and reflectors, mirrors, coupling and other devices are in good working order:
1. ( ) at the end of each trip.
2. ( ) before the vehicle may be driven.
3. ( ) only when he considers it necessary.
4. ( ) according to schedules set by the carrier.

16. 392.8 Which of the following must be in place and ready for use before a vehicle can be driven?
1. ( ) at least one spare fuse or other overload protector of each type used on the vehicle.
2. ( ) a tool kit containing a specified list of hand tools.
3. ( ) at least one spare tire for every four wheels.
4. ( ) a set of spark plugs.

17. 392.9(a)(3) If any part of the cargo or anything else blocks a driver's front or side views, his arm or leg movements, or his access to emergency equipment, the driver:
1. ( ) can drive the vehicle, but must report the problems at the end of the trip.
2. ( ) cannot drive the vehicle.
3. ( ) can drive the vehicle, but only at speeds under 40 miles per hour.
4. ( ) can drive the vehicle, but only on secondary roads.

18. 392.9(a) Any driver who needs glasses to meet the minimum visual requirements:
1. ( ) must drive only during daylight hours.
2. ( ) must always wear his glasses when driving.
3. ( ) must always carry a spare pair of glasses.
4. ( ) must not drive a motor vehicle.

19. 392.9(b) A driver may drive with a hearing aid:
1. ( ) if he always has it turned on while he is driving.
2. ( ) if he always carries a spare power source for it.
3. ( ) if he can meet the hearing requirements when he has it turned on.
4. ( ) if all of the above requirements are met.

20. 392.10(a) A driver required to stop at a railroad crossing should bring his vehicle to a stop no closer to the tracks than:
1. ( ) 5 feet.
2. ( ) 10 feet.
3. ( ) 15 feet.
4. ( ) 20 feet.

21. 392.10(a) Shifting gears is not permitted:
1. ( ) when traveling faster than 35 miles per hour.
2. ( ) when moving across any bridge.
3. ( ) when crossing railroad tracks.
4. ( ) when traveling down a hill steeper than 10 degrees.

22. 392.13 Drivers of motor vehicles not required to stop at drawbridges without signals:
1. ( ) must drive at a rate of speed which will permit a stop before reaching the lip of the draw.
2. ( ) must sound their horn before crossing.
3. ( ) can proceed across without reducing speed.
4. ( ) must slow down only if directed to by an attendant.

23. 392.15(a) A driver turning his vehicle should begin flashing his turn signal:
1. ( ) at least 50 feet before turning.
2. ( ) at least 60 feet before turning.
3. ( ) at least 75 feet before turning.
4. ( ) at least 100 feet before turning.

24. 392.16 Which of the following is true?
1. ( ) if a seat belt is installed in the vehicle, a driver must have it fastened before beginning to drive.
2. ( ) a driver may or may not use the seat belt, depending on his judgment.
3. ( ) seat belts are not necessary on heavier vehicles.
4. ( ) a driver must use his seat belt only if required to by the carrier.

25. 392.21 When a motor vehicle cannot be stopped off the traveled part of the highway, the driver:
1. ( ) must keep driving.
2. ( ) may stop, but shall get as far off the traveled part of the highway as possible.
3. ( ) may stop, but shall make sure that the vehicle can be seen as far as possible to its front and rear.
4. ( ) may stop if he has to, but should do both 2 and 3 above.

26. 392.22(b)(1) If a vehicle has a breakdown the driver must place one emergency signal:
1. ( ) 100 feet in front of the vehicle in the center of the lane it occupies.
2. ( ) 100 feet in back of the vehicle in the center of the lane it occupies.
3. ( ) 10 feet in front or back of the traffic side.
4. ( ) at all of the above locations.

27. 392.22(b)(1)(i) If a vehicle has a breakdown on a poorly-lit street or highway, the driver shall place on the traffic side:
1. ( ) a reflective triangle.
2. ( ) a lighted red electric lantern.
3. ( ) a red reflector.
4. ( ) any one of the above.

28. 392.22(b)(2)(iii) No emergency signals are required for a vehicle with a breakdown if the street or highway lighting is bright enough so it can be seen at a distance of:
1. ( ) 100 feet.
2. ( ) 200 feet.
3. ( ) 500 feet.
4. ( ) 750 feet.

29. 392.22(b)(2)(v) If a vehicle has a breakdown and stops on a poorly-lit divided or one way highway, the driver must place one emergency signal:
1. ( ) 200 feet in back of the vehicle in the center of the lane it occupies.
2. ( ) 100 feet in back of the vehicle on the traffic side of the vehicle.
3. ( ) 10 feet in back of the vehicle on the traffic side of the vehicle.
4. ( ) at all of the above locations.

30. 392.25 Lighted flame-producing emergency signals, including fuses:
1. ( ) may not be used with vehicles carrying Class A or B explosives.
2. ( ) may not be used with tank vehicles, loaded or empty, which are used to carry flammable liquids or gas.
3. ( ) may not be used with any vehicle using compressed gas as a fuel.
4. ( ) may not be used with any of the above.

31. 392.30(a) A driver is required to have his lights on:
1. ( ) from one-half hour *before* sunset to one-half hour before sunrise.
2. ( ) from one-half hour before sunset to sunrise.
3. ( ) from one-half hour *after* sunset to one-half hour *before* sunrise.
4. ( ) from sunset to one-half hour before sunrise.

32. 392.32(a)(b) When lights are required on the open highway, a driver shall use the high beam:
1. ( ) except when within 500 feet of an on-coming vehicle or a vehicle he is following.
2. ( ) except when within 400 feet of an on-coming vehicle or a vehicle he is following.
3. ( ) except when within 200 feet of an on-coming vehicle or a vehicle he is following.
4. ( ) except when within 100 feet of an on-coming vehicle or a vehicle he is following.

33. 392.32(a) When lights are required, drivers may use lower beam lights:
1. ( ) when fog, dust or other such conditions exist.
2. ( ) when approaching tunnels or bridges.
3. ( ) when driving on one way highways.
4. ( ) when within 1,000 feet of business areas or where people live.

34. 392.40 Every driver involved in an accident must follow the Safety Regulation procedures whenever an injury or death is involved or if:
1. ( ) the accident is caused by the driver and property damage of over $250.00 results.
2. ( ) property damage of over $250.00 results, no matter who is at fault.
3. ( ) property damage of over $100.00 results.
4. ( ) property damage of any kind results.

35. 392.41 If a driver strikes a parked vehicle, he should *first*:
1. ( ) stop and call the local police.
2. ( ) stop and call his carrier.
3. ( ) stop and try to find the driver or owner of the parked vehicle.
4. ( ) stop and estimate the damage.

36. 392.42 When a driver receives notice that his operator's license or permit has been revoked, suspended, or withdrawn, he must:
1. ( ) notify his carrier within 72 hours.
2. ( ) notify his carrier within one week.
3. ( ) notify his carrier before the end of the next business day.
4. ( ) take no action since his carrier will also get a notice.

37. 392.6 Except in emergencies, no driver shall allow his vehicle to be driven by any other person:
1. ( ) except those he knows can drive it.
2. ( ) except on roads with little or no traffic.
3. ( ) except those allowed by the carrier to do it.
4. ( ) unless he goes along with the person driving.

38. 392.64 A person may ride inside a vehicle's closed body or trailer:
1. ( ) only on short runs.
2. ( ) only if there is an easy way to get out from the inside.
3. ( ) only if the inside of the body or trailer is lighted.
4. ( ) only if there is no cargo in it.

39. 392.66 If carbon-monoxide is inside a vehicle or if a mechanical problem may produce a carbon-monoxide danger, the vehicle:

1. ( ) may be sent out and driven so long as the windows are left open.
2. ( ) may not be sent out or driven.
3. ( ) may be sent out and driven only if the carrier decides the vehicle has to be used.
4. ( ) may be sent out and driven on short runs.

40. 392.66 No motor vehicle shall be operated out of gear:

1. ( ) except when fuel must be saved.
2. ( ) except on hills which are less than 20 degrees.
3. ( ) except when it is necessary for stopping or shifting gears.
4. ( ) except when the vehicle's speed is under 25 miles per hour.

41. 393.1(a) Under the Federal Motor Carrier Safety Regulations, no vehicle may be driven:

1. ( ) until a list of all missing or defective equipment has been prepared and given to the carrier.
2. ( ) until all equipment has been inspected and replacements for defective parts have been ordered.
3. ( ) unless all missing equipment is to be replaced no later than the end of the vehicle's next run.
4. ( ) until it meets all of the equipment requirements of the Regulations.

42. 393 various Minimum requirements for lighting, reflecting and electrical equipment and devices on buses and trucks:

1. ( ) are set by the vehicle makers.
2. ( ) are set by the National Safety Council.
3. ( ) are specified in the Safety Regulations.
4. ( ) are set by the trucking associations.

43. 393.18(a)(b) Every motor vehicle which has a load sticking out over its sides must be specifically marked with flags and lamps. Additional flags and lamps must be added if the load or tailgate sticks out beyond the rear of the vehicle by more than:

1. ( ) 3 feet.
2. ( ) 4 feet.
3. ( ) 6 feet.
4. ( ) 8 feet.

44. 393.41(a) Every vehicle shall have a parking brake system which will hold it, no matter what its load:

1. ( ) on any grade on which it is operated which is free from ice and snow.
2. ( ) on all grades under 15 degrees which are free from ice and snow.
3. ( ) on all grades under 20 degrees which are free from ice and snow.
4. ( ) on all grades under 25 degrees which are free from ice and snow.

45. 393.77(b)(6) A portable heater may not be used in any vehicle cab:

1. ( ) unless it is secured.
2. ( ) unless it is of the electric filament type.
3. ( ) at any time.
4. ( ) without approval from the carrier.

46. 395.3(a) Drivers are not generally allowed to drive for more than:

1. ( ) 6 hours following 8 straight hours off duty.
2. ( ) 8 hours following 8 straight hours off duty.
3. ( ) 10 hours following 8 straight hours off duty.
4. ( ) 12 hours following 8 straight hours off duty.

47. 395.3(a) Most drivers of large vehicles are not allowed to drive:

1. ( ) after they have been on duty for 16 hours.
2. ( ) after they have been on duty for 15 hours.
3. ( ) after they have been on duty for 14 hours.
4. ( ) after they have been on duty for 12 hours.

48. 395.3(b) Generally, a driver may not be "on duty":

1. ( ) for more than 40 hours in any 7 straight days.
2. ( ) for more than 50 hours in any 7 straight days.
3. ( ) for more than 60 hours in any 7 straight days.
4. ( ) for more than 70 hours in any 7 straight days.

49. 395.7 When a driver is riding in a vehicle, but is not driving and has no other responsibility, such time shall be counted as:

1. ( ) on-duty time.
2. ( ) on-duty time unless he is allowed 8 straight hours off duty when he gets to the destination.
3. ( ) on-duty time unless he is allowed 6 straight hours off duty when he gets to the destination.
4. ( ) on-duty time unless he is allowed 4 straight hours off duty when he gets to the destination.

50. 395.8(b) Every driver must prepare an original and one copy of a daily log which he must keep current by updating it:

1. ( ) every time he changes a duty status.
2. ( ) every 24 hours.
3. ( ) every 8 hours.
4. ( ) at the end of each trip.

51. 395.8(c) Except for the name and main address of the carrier, all entries in a log:

1. ( ) must be printed in ink or typed.
2. ( ) must be made by the carrier dispatcher.
3. ( ) must be made in front of a witness.
4. ( ) must be written in the driver's own handwriting.

52. 395.8(1)(p)(q) Which of the following is not to be put in a driver's log?

1. ( ) Time spent in a sleeper berth.
2. ( ) Total hours in each duty status.
3. ( ) The name of the carrier or carriers.
4. ( ) The name and make of his vehicle.

53. 395.11 If an emergency delays a run which could normally have been completed within hours of service limits, the driver:

1. ( ) must still stop driving when the hours of service limit is reached.
2. ( ) may drive for 1 extra hour.
3. ( ) may drive for 2 extra hours.
4. ( ) may finish his run without being in violation.

54. 395.13 Any driver declared "Out of Service":

1. ( ) must take a road test before driving again.
2. ( ) must wait 72 hours before driving again.
3. ( ) must appeal to the Director of the Bureau of Motor Carrier Safety to drive again.
4. ( ) can drive again only after hours of service requirement are met.

55. 396.4 If a vehicle on a trip is in a condition likely to cause an accident or breakdown:

1. ( ) the driver should report it at the end of his run so repairs can be made.
2. ( ) the driver should drive at lower speeds for the rest of the run.
3. ( ) the driver should stop immediately unless going on to the nearest repair shop is safer than stopping.
4. ( ) the driver should change his route so as to get away from heavily traveled roads.

56. 396.5(c) If authorized Federal inspectors find a vehicle which is likely to cause an accident or breakdown:

1. ( ) it will be reported to the carrier for repair as soon as the vehicle is not scheduled.
2. ( ) it will be reported to the carrier for repair at the end of the trip.
3. ( ) it will be marked with an "Out of Service Vehicle" sticker and not driven until repairs are made.
4. ( ) the driver will be held responsible and declared "Out of Service."

57. 396.5(c)(4) If the driver makes his own repairs on an "Out of Service" vehicle:

1. ( ) his work must be approved by a mechanic.
2. ( ) he must complete and sign a "Certification of Repairman" form himself.
3. ( ) his work must be approved by his supervisor.
4. ( ) his work must be approved by a Federal inspector.

58. 397.3 Department of Transportation Regulations covering the driving and parking of vehicles containing hazardous materials:

1. ( ) replace State and local laws.
2. ( ) prevent States and cities from having their own laws.
3. ( ) must be obeyed even if State or local laws are less strict or disagree.
4. ( ) should not be obeyed if State or local laws disagree.

59. 397.5(c) A vehicle which contains hazardous materials other than Class A or B explosives must be attended at all times:

1. ( ) by the driver.
2. ( ) by the driver except when he is involved in something else necessary to his duties as a driver.
3. ( ) by the driver or a person chosen by the driver.
4. ( ) by the driver or a police officer.

60. 397.5(d)(1) A vehicle containing Class A or B explosives or other hazardous materials on a trip is "attended":

1. ( ) when the person in charge is anywhere within 100 feet of it.
2. ( ) as long as the driver can see it from 200 feet away.
3. ( ) when the person in charge is within 100 feet and has a clear view of it.
4. ( ) when the person in charge is resting in the berth.

61. 397.7(a)(3) Except for short periods when operations make it necessary, vehicles carrying Class A or B explosives cannot be parked any closer to bridges, tunnels, buildings or crowds of people than:

1. ( ) 50 feet.
2. ( ) 100 feet.
3. ( ) 200 feet.
4. ( ) 300 feet.

62. 397.13(a) Smoking or carrying a lighted cigarette, cigar or pipe near a vehicle which contains explosives, oxidizing or flammable materials is not allowed:

1. ( ) except in the closed cab of the vehicle.
2. ( ) except when the vehicle is moving.
3. ( ) except at a distance of 25 feet or more from the vehicle.
4. ( ) except when approved by the carrier.

63. 397.16(a)(b) When a vehicle containing hazardous materials is being fueled

1. ( ) no person may remain in the cab.
2. ( ) a person must be in control of the fueling process at the point where the fuel tank is filled.
3. ( ) the area within 50 feet of the vehicle must be cleared.
4. ( ) the person who controls the fueling process must wear special clothes.

64. 397.17(a) If a vehicle carrying hazardous materials is equipped with dual tires on any axle, the driver must examine the tires:

1. ( ) at all fueling stops only.
2. ( ) only at the end of each day or tour of duty.
3. ( ) at the beginning of each trip and each time the vehicle is parked.
4. ( ) at the beginning of each trip only.

65. 397.17(c) If a driver of a vehicle carrying hazardous materials finds a tire which is overheated, he must:

1. ( ) wait for the overheated tire to cool before going on.
2. ( ) remove and replace the overheated tire, store it on the vehicle and drive on.
3. ( ) remove the tire, place it a safe distance from the vehicle and not drive the vehicle until the cause of the overheating is fixed.
4. ( ) drive slowly to the nearest repair shop and have the cause of the overheating fixed.

66. 177.823(a)(3) When required, specified hazardous materials markings or signs must be placed:

1. ( ) wherever they can be seen clearly.
2. ( ) on the sides and rear of the vehicle.
3. ( ) on the front, rear and sides of the vehicle.
4. ( ) on the front and rear bumpers of the vehicle.

Scoring Key

WRITTEN EXAMINATION

Section:	Answer
(1) 390.32	4
(2) 391.11(b)(1)	4
(3) 391.15(c)(2)(3)	4
(4) 391.21(b)(7)(8)(10)	4
(5) 391.27(a)(b)	1
(6) 391.38(2)	3
(7) 391.41(b)(5)	1
(8) 391.41(b)(7)	3
(9) 391.41(b)(8)	2
(10) 391.41(b)(9)(12)(13)	4
(11) 391.45(c)	3
(12) 392.2	2
(13) 392.3	4
(14) 392.5(a)(1)	1
(15) 392.7	2
(16) 392.8	1
(17) 392.9(a)(3)	2
(18) 392.9 a	2
(19) 392.9 b	4
(20) 392.10(a)	3
(21) 392.10(a)	3
(22) 392.13	1
(23) 392.15(a)	4
(24) 392.16	1
(25) 392.21	4
(26) 392.22(b)(1)	4
(27) 392.22(b)(1)(i)	4
(28) 392.22(b)(2)(iii)	3
(29) 392.22(b)(2)(v)	4
(30) 392.25	4
(31) 392.30(a)	3
(32) 392.33(a)(b)	1
(33) 392.33(a)	1
(34) 392.60	4
(35) 392.61	3
(36) 392.63	2
(37) 392.81	3
(38) 392.84	2
(39) 392.86	2
(40) 393.68	3
(41) 393.1(a)	4
(42) 393 various	3
(43) 393.13(a)(b)	2
(44) 393.41(a)	1
(45) 393.77(b)(6)	2
(46) 395.3(a)	3
(47) 395.3(a)	3
(48) 395.3(b)	3
(49) 395.7	2
(50) 395.8(b)	1
(51) 395.8(c)	4
(52) 395.8(1)(p)(q)	4
(53) 396.11	4
(54) 396.13	4
(55) 396.4	3
(56) 396.5(c)	3
(57) 396.5(c)(4)	2
(58) 397.3	3
(59) 397.5(c)	2
(60) 397.5(d)(1)	3
(61) 397.7(a)(3)	4
(62) 397.13(a)	3
(63) 397.15(a)(b)	2
(64) 397.17(a)	3
(65) 397.17(c)	3
(66) 177.823(a)(3)	3

TELEDYNE ISOTOPES

CERTIFICATION OF WRITTEN EXAMINATION

This is to certify that the person whose signature appears below, has completed the written examination under my supervision in accordance with the provisions of 391.35 of the Motor Carrier Safety Regulations.

_____ _____

(Signature of person taking examination) (Date of examination)

_____

(Location of Examination)

_____

(Signature of examiner)

_____

(Organization and address of examination)

NOTE: Examiner, by his signature above, indicates he has advised driver-applicant of the correct answers to any questions he failed to answer correctly.

FORM TWL-RW-221 ISSUED 4/1/80

TELEDYNE ISOTOPES

DRIVER ROAD TEST

Driver's Name _____

Social Security Number _____ Drivers License No. & State _____

Type of Unit Tested on _____
(tractor-trailer-truck-etc.)

If Passenger Carrier, Type of Bus _____
(school bus-taxi-coach)

Grade driver in the below areas of operation on the basis of (E) excellent, (G) good, (F) fair and (P) poor:

1. Pretrip inspection of entire rig. _____
2. Coupling and uncoupling of rig if a combination unit. _____
3. Use of vehicle controls, (turn signals, horn, wipers, clearance lites, etc.) _____
4. Use of vehicle's safety equipment. _____
5. Operations of vehicle in traffic, (stopping, starting, passing, & concerning) _____
6. Braking and slowing vehicle without the use of normal foot brake. _____
7. Backing and parking the vehicle. _____
8. Courtesy of driver to other motorist and pedestrians. _____

This is to certify that the above named driver was given a road test under my supervision on _____ 19 _____ consisting of _____ miles driving.

It is my considered opinion that this driver passed sufficient driving skills to operate the type of commercial motor vehicle listed above.

_____ _____
SIGNATURE OF EXAMINER TITLE

_____
ORGANIZATION AND ADDRESS OF EXAMINER

PHYSICAL EXAMINATION OF DRIVERS

Name: _____

Address: _____

Social Security No.: _____ Date of Birth: _____ Age: _____

☐ New Certification ☐ Recertification

HEALTH HISTORY

Yes	No	
☐	☐	Head or spinal injuries.
☐	☐	Seizures, fits, convulsions, or fainting.
☐	☐	Extensive confinement by illness or injury.
☐	☐	Cardiovascular disease.
☐	☐	Tuberculosis.
☐	☐	Syphilis.
☐	☐	Gonorrhea.
☐	☐	Diabetes.
☐	☐	Gastrointestinal ulcer.

Yes	No	
☐	☐	Nervous stomach
☐	☐	Rheumatic fever.
☐	☐	Asthma.
☐	☐	Kidney disease.
☐	☐	Muscular disease.
☐	☐	Suffering from any other disease.
☐	☐	Permanet defect from illness, disease or injury.
☐	☐	Psychiatric disorder.
☐	☐	Any other nervous disorder.

If answer to any of the above is yes, explain: _____

PHYSICAL EXAMINATION

General appearance and development: Good: _____ Fair: _____ Poor: _____

Vision: For distance: Right 20/_____ Left 20/_____ ☐ Without corrective lenses ☐ With corrective lenses if worn

Evidence of disease of injury: Right: _____ Left: _____ Color Test: _____

Horizontal field of vision: Right _____ Left _____

Hearing: Right ear _____ Left ear _____ Disease or injury _____

Audiometric Test (complete only if audiometer is used to test hearing) decibel loss at 500 Hz _____,

at 1,000 Hz _____, at 2,000 Hz _____

Throat _____

Thorax: Heart _____ If organic disease is present, is it fully compensated? _____

Blood pressure: Systolic _____ Diastolic _____

Pulse: Before exercise _____ Immediately after exercise _____ Lungs _____

Abdomen: Scars _____ Abnormal masses _____ Tenderness _____

Hernia: Yes _____ No _____ If so, where? _____ Is truss worn? _____

Gastrointestinal: Ulceration or other disease: Yes _____ No _____

Genito-Urinary: Scars _____ Urethral discharge _____

Reflexes: Romberg _____ Pupillary _____ Light R _____ L _____

Accommodation Right _____ Left _____

Knee Jerks: Right: Normal _____ Increased _____ Absent _____

Left: Normal _____ Increased _____ Absent _____

Remarks: _____

Extremities: Upper _____ Lower _____ Spine _____

Laboratory and other Special Findings: Urine: Spec. Gr. _____ Alb. _____ Sugar _____

Other laboratory data (serology, etc) _____

Radiological data _____ Electrocardiograph _____

General comments _____

(Date of examination) (Address of examining doctor) (Name of examining doctor)(Print)

(Signature of examining doctor)

NOTE: This section to be completed only when visual test is conducted by a licensed optometrist.

(Date of examination) (Address of optometrist) (Name of optometrist)(Print)

(Signature of optometrist)

MEDICAL EXAMINER'S CERTIFICATE

I certify that I have examined _____ in accordance with the Federal Motor Carrier Safety Regulations
(Driver's name)(Print)

(49 CFR 391.41-391.49) and with knowledge of his duties, I find him qualified under the regulations.

☐ Qualified only when wearing corrective lenses.
☐ Qualified only when wearing a hearing aid.

A completed examination form for this person is on file in my office at _____
(Address)

(Date of examination) (Name of examining doctor)(Print) (Signature of examining doctor)

(Address of driver) (Signature of driver)

IWL-RW-223 issued: 1/80
revised 8/88

TELEDYNE ISOTOPES

RADIOACTIVE WASTE PROCEDURES EXAMINATION

PART I. Fill in the blanks (each blank worth 2 pts.)

1. List twenty (20) items needed to perform a Radioactive Waste Pickup:

   _____ _____ _____ _____

   _____ _____ _____ _____

   _____ _____ _____ _____

   _____ _____ _____ _____

   _____ _____ _____ _____

2. You should call in advance to a bridge requiring prior notification at least _____ hour(s) prior to arriving at the bridge.

3. Before departing and at the beginning of each day, perform the _____ as detailed in your driver's log book.

4. If no authbrized person is available at the time you arrive at a facility, _____.

5. While inspecting the drum and contents, if the item does not appear to be packaged in accordance with the latest packaging procedures _____ and _____ _____.

6. Swipe approximately _____ cm^2 of each container and hold to the _____ _____ of the GM counter.

7. Label the drum with the mR/hr reading if in excess of _____.

8. The level of radiation (mR/hr) at the outside of the warehouse must not exceed _____.

9. If spillage occurs within a facility, you must first contact the _____ of their facility and then either _____, _____ _____.

10. In the event of a breakdown, place one red reflective triangle _____ feet behind the vehicle in the center of the lane it occupies. Place another red reflective triangle 100 feet _____ the vehicle in the center of the lane it occupies. Place the third _____ feet _____ the vehicle on the traffic side.

11. You must notify the State of New Jersey whenever transporting more than _____ curies of radioactive material.

12. _____ must be applied to the vehicles during all sole-use shipments.

13. _____ and _____ must be attached to the doors of all shipments to the burial site.

14. All radioactive shipments must be _____ and _____ before being released.

15. There must be three sets of completed paperwork for each shipment. One each for _____, _____ and _____.

TRUE/FALSE (each question 2 pts.)

16. The amount of an isotope allowed in a container can be determined by the isotopes Transport Index and form (special or normal).

17. All "normal" and "special" form packages require security seals when being shipped by a non-exclusive use vehicle.

18. Packages which have Radioactive Yellow II labels on them, must have a security seal.

19. A truck containing 2 drums of Radioactive Yellow II labelled material, with security seals, need not be placarded.

20. During a vehicle breakdown, it's alright to leave the vehicle as long as you leave with a policeman and you lock up the truck.

Test Date: _____

Taken by: _____

Examiner's signature: _____

Answers gone over on: _____

TELEDYNE ISOTOPES

ANSWERS TO R.W.P. EXAM

45 pts. fill ins:

1. See Checklist for Radioactive Waste Pickup form No. IWL-RW-207.
2. One-half
3. Vehicle inspection.
4. Call the office.
5. Refuse acceptance, call the office.
6. 300, end window.
7. 10 mR/hr.
8. 0.5 mR/hr
9. Radiation Safety Officer, our Radiation Safety Officer, Assist. Radiation Safety Officer or Dr. Schutz.
10. 100, in front of, 10, in front of or behind.
11. 20
12. 12 placards
13. Security seals
14. Braced (secured) and surveyed (monitored)
15. Teledyne, T-SMT, NECO.

TRUE/FALSE

16. False- transport group
17. True
18. True
19. True
20. False- do not leave vehicle unattended unless in an extreme emergency.

TELEDYNE ISOTOPES

ANNUAL REVIEW OF DRIVING RECORD

On _____, 19____, I _____

_____ carefully reviewed the driving record

of _____ residing at _____

_____

to determine whether he meets the minimum requirements for safe driving specified in Section 391.11 of Title 49 Code of Federal Regulations or is disqualified to drive a motor vehicle pursuant to Section 391.15.

In reviewing this driver's record, I have considered any evidence that the driver has violated applicable provisions of the Motor Carrier Safety Regulations and the Hazardous Materials Regulations. I also consider the driver's accident record and any evidence that the driver has violated laws governing the operation of motor vehicles, and gave great weight to violations, such as speeding, reckless driving, and operating while under the influence of alcohol or drugs, that indicate that the driver has exibited a disregard for the safety of the public.

_____ _____

Date Signature

Form IWL-RW-225 issued: 4/80

TELEDYNE ISOTOPES

STATEMENT OF CERTIFICATION

Teledyne Isotopes has on file in our offices located at 50 Van Buren Avenue, Westwood, New Jersey, certifications from the actual generators in the form of an agreement. By signing the agreement, the generator accepts the liability for properly identifying and packaging the waste and, Teledyne Isotopes accepts the liability for supplying the proper container and properly marking and labeling the container based on the information supplied by the generator.

This statement applies to all packages on shipment number _____.

TELEDYNE ISOTOPES

Steven A. Black, R.S.O.
Manager, Radiological Services Department

TELEDYNE ISOTOPES

RADIOACTIVE MATERIALS PACKAGING AND TRANSPORTATION ACTIVITIES AUDIT CHECKLIST

Laboratory/Department _____ Supervisor _____

License No. _____ License Activity _____

Subcommittee Members _____ Date _____

_____

_____

ITEM	Yes	No	NA
I. DOCUMENTATION			
A. Distribution of procedures to all personnel involved with the safe packaging of Radioactive materials?			
Documented?			
B. Distribution of procedures to all personnel involved with the safe transportation of Radioactive materials?			
Documented?			
C. Review of forms required for departmental use.			
Available?			
D. Distribution list of documents kept by supervisor?			
Updated? When?			
E. Organization shown correctly on organization chart?			
II. TRAINING & SUPERVISION			
A. Does each employee have in his file			
1) "Basic Course in Health Physics (Form IWL-RW-HP-)			
2) "Radioactive Waste Procedures Examination" (Form IWL-RW-224)			
3) "Packaging of Radioactive Waste Examination" (Form IWL-RW-)			
4) Other _____			

TELEDYNE ISOTOPES

REVIEW AND EVALUATION OF RADIOACTIVE MATERIALS ACTIVITIES AUDIT

Laboratory/Department _____ Supervisor _____

License No. _____ License Activity _____

Subcommittee Members _____ Date _____

_____

_____

	Yes	No	NA
I. REVIEW			
A. Documentation Acceptable?			
B. Training Acceptable?			
C. Operating Procedures Acceptable?			
D. Working Conditions Acceptable?			
II. EVALUATION			
A. Review and Audit Acceptable			

B. Problem areas:

1. Define _____

_____

_____

2. Observed by: _____

on: _____

3. Corrective action required _____

_____

By: _____ on: _____

4. Corrective action taken _____

By: _____ on: _____

C. Discussed by Radiation Safety Committee

1. Discussed with _____
2. Discussed on _____
3. Action required _____

_____

Form IWL-RW-229 issued: 12/80

TELEDYNE ISOTOPES

Page _____ of _____

RADIOACTIVE WASTE
BURIAL CERTIFICATION
FOR THE US ECOLOGY, RICHLAND, WA. SITE

SHIPMENT NO. _____ TRAILER NO. _____

On the below date, the containers listed below were accepted for burial in accordance with US Ecology's Washington State License No. WN-I019-2.

Date: _____

Accepted By: _____

DRUM ID #	DRUM ID #	DRUM ID #	DRUM ID #	DRUM ID #	DRUM ID #	DRUM ID #	DRUM ID #

TELEDYNE ISOTOPES

Packaging of Radioactive Waste Examination

I. Fill in the blanks (3 pts. each)

1. List 5 characteristics of the material needed in order to determine the "proper shipping names":

_____ _____

_____ _____

_____

2. List 5 "proper shipping names":

_____ _____

_____ _____

_____

3. The radiation limit at contact with the container cannot exceed _____ mR/hr for a package of LSA material.

4.

Label	mR/hr limits @ contact
Radioactive White I	_____ to _____
Radioactive Yellow II	_____ to _____
Radioactive Yellow III	_____ to _____

5. The marking (label) needed on a package of LSA material (exclusive-use) should read _____.

6. The marking (label) on a package of Radioactive devices should read _____.

7. The weight is required to be printed on a container when it is in excess of _____ lbs., and it is a DOT-7A TYPE A container.

8. List the 6 categories of radioactive waste:

_____ _____

_____ _____

_____ _____

9. Items in different categories _____ be mixed.

10. ALL SVL drums must be lined with a _____.

11. The amount of absorbant added to any SVL drum must be capable of absorbing _____ the volume of liquid in the drum.

12. Liquid Special Nuclear Material has to be _____ before disposal.

II. True or False (1 pt. each)

1. _____ All drums which have a Radioactive I, II or III label require security seals.

2. _____ 400 lbs. is the maximum weight allowed in a 55-gallon container.

3. _____ 11 gallons of liquids are allowed in a DWLVL container.

4. _____ Two 2-mil liners is an acceptable substitute for a 4-mil liner.

5. _____ The pH range for liquids in a DWLVL container is 5.0-10.0.

6. _____ The animal carcass is to be completely surrounded with rock salt and absorbant.

7. _____ Cement is an acceptable solidification media.

8. _____ H-3 gas is acceptable at the Washington burial site under certain conditions.

9. _____ Packaging regulations are under the direct control of the NRC only.

10. _____ The burial site's requirements are of paramount consideration when determining how to package a given material.

TELEDYNE ISOTOPES

USER REQUEST FORM

TO BE FILLED OUT BY INDIVIDUAL

Name _____ Social Security # _____

Birth Date _____ Contact Lenses _____Yes _____No

Highest level of education completed _____

Type of Training	Where Trained	Duration of Training	On the Job	Formal Course
a. Principles and practices of radiation protection			Yes No	Yes No
b. Radioactive measurement standardization and monitoring techniques and instruments			Yes No	Yes No
c. Mathematics and calculations basic to the use and measurement of radioactivity			Yes No	Yes No
d. Biological effects of radiation			Yes No	Yes No

EXPERIENCE WITH RADIATION (Actual use of radioisotopes or equivalent experience)

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE

TO BE FILLED OUT BY SUPERVISOR

Radiation work for which authorization is sought: _____

Isotopes: _____ Physical & Chemical Form: _____

Activity: _____ Supervisor Requesting Authorization: _____

Safety Glasses Required: ____Yes ____No Date: _____

TO BE FILLED OUT BY THE SAFETY DEPT.

Health Physics Comments _____

TLD Badge Required: ____Yes ____No Bioassay Required: ____Yes ____No

Type _____ Analysis _____ Frequency _____

Authorization Date _____ By _____
Radiation Safety Officer

COPY DISTRIBUTION

Copies of this form are to be distributed as follows:

_____Health Physics _____Supervisor _____TLD Badge Service

Original form to be returned to Personnel Department

Form IWL-HP-06 (Rev. 4/86)

TELEDYNE ISOTOPES

BASIC HEALTH PHYSICS TRAINING COURSE

Name _____ Length of Course _____

Presented by _____ Test _____

Course Outline

I. Introduction
   - A. Electromagnetic Spectrum
   - B. Ionizing Radiation
     1) Alpha
     2) Beta
     3) Gamma
     4) X-rays

II. History of Uses
   - A. Consumer Reports
   - B. Medical
   - C. Industry

III. Nuclear Constituents, Properties & Production
   - A. Alpha Particles
   - B. Beta Particles
   - C. Fission
   - D. Gamma & X-rays

IV. History of the Atom
   - A. Democritus
   - B. Modern Theory
   - C. Applications for Radiation

V. Radiation Protection
   - A. Monitoring Instrumentation
     1) Film badges
     2) Thermoluminexcent dosimeters
     3) Portable survey meters
     4) Bioassay
   - B. Effects
     1) Chemical change
     2) Biological
     3) High doses
     4) Low doses
     5) Incidence of disease
   - C. Cause & Effect Relationships
   - D. Risk Assessment
   - E. Regulations
     1) ICRP
     2) NCRP
     3) Discussion of Lauristan Taylor
   - F. Organizational Groups
   - G. Prenatal Exposure: Regulatory Guide 8.13

I have received the training outline above, read the Radiation Safety Manual and Regulatory Guide 8.13 "Instruction concerning Prenatal Radiation Exposure", and understand its implications. Any questions I may have had were answered to my satisfaction.

Employee's Signature _____ Date _____

Remarks _____

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ATTACHMENT E

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Attachment E

Irrevocable Standby Letter of Credit No. [*insert no.*]

This Credit Expires [*insert date*]

Issued to: U.S. Nuclear Regulatory Commission
Washington, DC 20555

Dear Sir or Madam:

We hereby establish our Irrevocable Standby Letter of Credit No. [*insert no.*] in your favor, at the request and for the account of The Liposome Company, 1 Research Way, Princeton, NJ 08540 up to the aggregate amount of Tewnty-eight thousand, five hundred, U.S. dollars $28,500, available upon presentation of:

(1) your sight draft, bearing reference to this letter of Credit No. [*insert no.*] , and
(2) your signed statement reading as follows: "I certify that the amount of the draft is payable pursuant to regulations issued under authority of 10 CFR Part 30.

This letter of credit is issued in accordance with regulations issued under the authority of the U.S. Nuclear Regulatory Commission (NRC), an agency of the U.S. Government, pursuant to the Atomic Energy Act of 1954, as amended, and the Energy Reorganization Act of 1974. The NRC has promulgated regulations in Title 10, Chapter I of the Code of Federal Regulations, Part 30, which require that a holder of, or applicant for, a license issued under 10 CFR Part 30 provide assurance that funds will be available when needed for decommissioning.

This letter of credit is effective as of [*date*] and shall expire on [*date at least one year later*], but such expiration date shall be automatically extended for a period of [*at least one year*] on [*date*] and on each successive expiration date, unless, at least 90 days before the current expiration date, we notify you and The Liposome Company, by certified mail, as shown on the signed return receipts. If The Liposome Company is unable to secure alternative financial assurance to replace this letter of credit within 30 days of notification of cancellation the NRC may draw upon the full value of this letter of credit prior to cancellation. The bank shall give immediate notice to the applicant and the NRC of any notice received or action filed alleging (1) the insolvency or bankruptcy of the financial institution or (2) any violations of regulatory requirements that could result in the suspension or revocation of the bank's charter or license to do business. The financial institution also shall give immediate notice if the bank, for any reason, becomes unable to fulfill its obligation under the letter of credit.

Whenever this letter of credit is drawn on under and in compliance with the terms of this letter of credit, we shall duly honor such draft upon its presentation to us within 30 days, and we shall deposit the amount of the draft directly into the standby trust fund of The Liposome Company in accordance with your instructions.

Each draft must bear on its face the clause: "Drawn under Letter of Credit No. [*insert no.*], dated [*insert date*], and the total of this draft and all other drafts previously drawn under this letter of credit does not exceed $28,500.00.

[*signature(s) and title(s) of official(s) of issuing institution*]

[*date*]

This credit is subject to [*insert "the most recent edition of the Uniform Customs and Practice for Documentary Credits, published by the International Chamber of Commerce", or "the Uniform Commercial Code"*].

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ATTACHMENT F

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Attachment F

Decommissioning Cost Estimate

TABLE 1
Labor Estimates

Facility Name: The Liposome Company
Facility Address: 1 Research Way, Princeton, NJ
NRC License No.: 29-19[illegible]-01

Activities	Work Hours: Manager or R.S.O.	H.P. Supv.	H.P. Tech.	R.W. Tech.	Clerical	Total Hrs.	Total Cost
#1: Final Update of Decom. Plan	32	8	8	8	8	64	$5,000
#3: Characterization of Radiological Condition of the Facility	8	24	24	-	4	60	$4,240
#2, 5: *See Below							
#4: Decontamination, dismantling, or disposal	4	16	16	8	-	44	$3,220
#6: Final survey	8	8	8	8	8	40	$2,720
LABOR TOTALS	52	56	56	24	20	208	**$15,180**

*Labor rates are a part of the disposal costs. See Table 5 for estimated disposal costs.

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TABLE 2 Salary Rates Used in Table 1	Facility Name: NRC License No.:	The Liposome Company 29-19918-01

Worker Classification:	Worker Cost/Hour
Manager	$95.00
H.P. Supv.	$75.00
H.P. Tech.	$65.00
R.W. Tech.	$75.00
Clerical	$30.00

Table 3 DECONTAMINATION and/or DISMANTLING of RADIOACTIVE FACILITY COMPONENTS	Facility Name: NRC License No.: Room or Area:	The Liposome Company 29-19918-01 Animal Prep Room

Assumptions for this area:

10CFR61 Waste Class:	Disposal	Decon
% Class A	100.0%	100.0%
% Class B	0.0%	0.0%
% Class C	0.0%	0.0%
Disposal vs. Decon Estimates:		
% Contaminated Walls	0.0%	0.0%
% Contaminated Floors	0.0%	0.0%
% Contaminated Ductwork	0.0%	0.0%
% Contaminated Sinks & Drains	0.0%	0.0%
% Contaminated Hoods	0.0%	0.0%
% Contaminated Equip. (See Below)	0.0%	0.0%

Volume Estimates (cubic feet):

		10CFR Part 61 Waste Class		
Item:	Quantity	Class A	Class B	Class C
Glove Boxes	0.0	0.0	0.0	0.0
Fume Hoods	0.0	0.0	0.0	0.0
Hot Cells	0.0	0.0	0.0	0.0
Lab Benches	0.0	0.0	0.0	0.0
Sink and Drains	0.0	0.0	0.0	0.0
Amount of Floor Space (400 sq. ft.)	100.0	0.0	0.0	0.0
Ventillation Ductwork (0 linear ft.)	0.0	0.0	0.0	0.0
Amount of Wall Space (640 sq. ft.)	160.0	0.0	0.0	0.0
Other:				
Cage washer	100	0.0	0.0	0.0
VOLUME TOTALS:	360.0	0.0	0.0	0.0

Note: Quantity is the total volume under consideration.

Note: None of the items are expected to be contaminated.

Table 3 DECONTAMINATION and/or DISMANTLING of RADIOACTIVE FACILITY COMPONENTS	Facility Name: NRC License No.: Room or Area:	The Liposome Company 29-19918-01 Room 100A

Assumptions for this area:

10CFR61 Waste Class:	Disposal	Decon
% Class A	100.0%	100.0%
% Class B	0.0%	0.0%
% Class C	0.0%	0.0%
Disposal vs. Decon Estimates:		
% Contaminated Walls	0.0%	0.0%
% Contaminated Floors	0.0%	0.0%
% Contaminated Ductwork	0.0%	0.0%
% Contaminated Sinks & Drains	0.0%	0.0%
% Contaminated Hoods	0.0%	0.0%
% Contaminated Equip. (See Below)	0.0%	0.0%

Volume Estimates (cubic feet):

		10CFR Part 61 Waste Class		
Item:	Quantity	Class A	Class B	Class C
Glove Boxes	0.0	0.0	0.0	0.0
Fume Hoods	0.0	0.0	0.0	0.0
Hot Cells	0.0	0.0	0.0	0.0
Lab Benches	12.0	0.0	0.0	0.0
Sink and Drains	1.0	0.0	0.0	0.0
Amount of Floor Space (80 sq. ft.)	20.0	0.0	0.0	0.0
Ventillation Ductwork (0 linear ft.)	0.0	0.0	0.0	0.0
Amount of Wall Space (320 sq. ft.)	80.0	0.0	0.0	0.0
Other:				
VOLUME TOTALS	113.0	0.0	0.0	0.0

Note: Quantity is the total volume under consideration.

Note: None of the items are expected to be contaminated.

Table 3 DECONTAMINATION and/or DISMANTLING of RADIOACTIVE FACILITY COMPONENTS	Facility Name: NRC License No.: Room or Area:	The Liposome Company 29-19918-01 Room 100B Stock

Assumptions for this area:

10CFR61 Waste Class:	Disposal	Decon
% Class A	0.0%	100.0%
% Class B	0.0%	0.0%
% Class C	0.0%	0.0%
Disposal vs. Decon Estimates:		
% Contaminated Walls	0.0%	0.0%
% Contaminated Floors	0.0%	0.0%
% Contaminated Ductwork	0.0%	0.0%
% Contaminated Sinks & Drains	0.0%	0.0%
% Contaminated Hoods	0.0%	0.0%
% Contaminated Equip. (See Below)	0.0%	0.0%

Volume Estimates (cubic feet):

Item:	Quantity	10CFR Part 61 Waste Class Class A	Class B	Class C
Glove Boxes	0.0	0.0	0.0	0.0
Fume Hoods	0.0	0.0	0.0	0.0
Hot Cells	0.0	0.0	0.0	0.0
Lab Benches	0.0	0.0	0.0	0.0
Sink and Drains	1.0	0.0	0.0	0.0
Amount of Floor Space (80 sq. ft.)	20.0	0.0	0.0	0.0
Ventillation Ductwork (0 linear ft.)	0.0	0.0	0.0	0.0
Amount of Wall Space (180 sq. ft.)	45.0	0.0	0.0	0.0
Other:				
Shelves	48			
VOLUME TOTALS:	114.0	0.0	0.0	0.0

Note: Quantity is the total volume under consideration.

Note: None of the items are expected to be contaminated.

Table 3 DECONTAMINATION and/or DISMANTLING of RADIOACTIVE FACILITY COMPONENTS	Facility Name: NRC License No.: Room or Area:	The Liposome Company 29-19918-01 Room 101 A & B

Assumptions for this area:

10CFR61 Waste Class:	Disposal	Decon
% Class A	100.0%	100.0%
% Class B	0.0%	0.0%
% Class C	0.0%	0.0%
Disposal vs. Decon Estimates:		
% Contaminated Walls	0.0%	0.0%
% Contaminated Floors	0.0%	0.0%
% Contaminated Ductwork	0.0%	0.0%
% Contaminated Sinks & Drains	0.0%	0.0%
% Contaminated Hoods	0.0%	0.0%
% Contaminated Equip. (See Below)	0.0%	0.0%

Volume Estimates (cubic feet):

Item:	Quantity	10CFR Part 61 Waste Class Class A	Class B	Class C
Glove Boxes	0.0	0.0	0.0	0.0
Fume Hoods	0.0	0.0	0.0	0.0
Hot Cells	0.0	0.0	0.0	0.0
Lab Benches	24.0	0.0	0.0	0.0
Sink and Drains	1.0	0.0	0.0	0.0
Amount of Floor Space (80 sq. ft.)	20.0	0.0	0.0	0.0
Ventillation Ductwork (0 linear ft.)	0.0	0.0	0.0	0.0
Amount of Wall Space (320 sq. ft.)	80.0	0.0	0.0	0.0
Other:				
Tables	12			
VOLUME TOTALS:	137.0	0.0	0.0	0.0

Note: Quantity is the total volume under consideration.

Note: None of the items are expected to be contaminated.

Table 3 DECONTAMINATION and/or DISMANTLING of RADIOACTIVE FACILITY COMPONENTS	Facility Name: NRC License No.: Room or Area:	The Liposome Company 29-19918-01 Room 102 A & B

Assumptions for this area:

10CFR61 Waste Class:	Disposal	Decon
% Class A	100.0%	100.0%
% Class B	0.0%	0.0%
% Class C	0.0%	0.0%
Disposal vs. Decon Estimates:		
% Contaminated Walls	0.0%	0.0%
% Contaminated Floors	0.0%	0.0%
% Contaminated Ductwork	0.0%	0.0%
% Contaminated Sinks & Drains	0.0%	0.0%
% Contaminated Hoods	0.0%	0.0%
% Contaminated Equip. (See Below)	0.0%	0.0%

Volume Estimates (cubic feet):

Item:	Quantity	10CFR Part 61 Waste Class Class A	Class B	Class C
Glove Boxes	0.0	0.0	0.0	0.0
Fume Hoods	0.0	0.0	0.0	0.0
Hot Cells	0.0	0.0	0.0	0.0
Lab Benches	24.0	0.0	0.0	0.0
Sink and Drains	1.0	0.0	0.0	0.0
Amount of Floor Space (80 sq. ft.)	20.0	0.0	0.0	0.0
Ventillation Ductwork (0 linear ft.)	0.0	0.0	0.0	0.0
Amount of Wall Space (320 sq. ft.)	80.0	0.0	0.0	0.0
Other:				
Tables	12			
Animal cages	20			
VOLUME TOTALS:	157.0	0.0	0.0	0.0

Note: Quantity is the total volume under consideration.

Note: None of the items are expected to be contaminated.

Table 3
DECONTAMINATION and/or DISMANTLING of RADIOACTIVE FACILITY COMPONENTS

Facility Name: The Liposome Company
NRC License No.: 29-19918-01
Room or Area: Room 103 A & B

Assumptions for this area:

10CFR61 Waste Class:	Disposal	Decon
% Class A	100.0%	100.0%
% Class B	0.0%	0.0%
% Class C	0.0%	0.0%
Disposal vs. Decon Estimates:		
% Contaminated Walls	0.0%	0.0%
% Contaminated Floors	0.0%	0.0%
% Contaminated Ductwork	0.0%	0.0%
% Contaminated Sinks & Drains	0.0%	0.0%
% Contaminated Hoods	0.0%	0.0%
% Contaminated Equip. (See Below)	0.0%	0.0%

Volume Estimates (cubic feet):

		10CFR Part 61 Waste Class		
Item:	Quantity	Class A	Class B	Class C
Glove Boxes	0.0	0.0	0.0	0.0
Fume Hoods	0.0	0.0	0.0	0.0
Hot Cells	0.0	0.0	0.0	0.0
Lab Benches	24.0	0.0	0.0	0.0
Sink and Drains	1.0	0.0	0.0	0.0
Amount of Floor Space (80 sq. ft.)	20.0	0.0	0.0	0.0
Ventillation Ductwork (0 linear ft.)	0.0	0.0	0.0	0.0
Amount of Wall Space (320 sq. ft.)	80.0	0.0	0.0	0.0
Other:				
Tables	12			
Animal Cages	20			
VOLUME TOTALS:	157.0	0.0	0.0	0.0

Note: Quantity is the total volume under consideration.

Note: None of the items are expected to be contaminated.

Table 3 DECONTAMINATION and/or DISMANTLING of RADIOACTIVE FACILITY COMPONENTS	Facility Name: NRC License No.: Room or Area:	The Liposome Company 29-19918-01 Room 104 A & B

Assumptions for this area:

10CFR61 Waste Class:	Disposal	Decon
% Class A	100.0%	100.0%
% Class B	0.0%	0.0%
% Class C	0.0%	0.0%
Disposal vs. Decon Estimates:		
% Contaminated Walls	0.0%	0.0%
% Contaminated Floors	0.0%	0.0%
% Contaminated Ductwork	0.0%	0.0%
% Contaminated Sinks & Drains	0.0%	0.0%
% Contaminated Hoods	0.0%	0.0%
% Contaminated Equip. (See Below)	0.0%	0.0%

Volume Estimates (cubic feet):

		10CFR Part 61 Waste Class		
Item:	Quantity	Class A	Class B	Class C
Glove Boxes	0.0	0.0	0.0	0.0
Fume Hoods	0.0	0.0	0.0	0.0
Hot Cells	0.0	0.0	0.0	0.0
Lab Benches	24.0	0.0	0.0	0.0
Sink and Drains	1.0	0.0	0.0	0.0
Amount of Floor Space (280 sq. ft.)	70.0	0.0	0.0	0.0
Ventillation Ductwork (0 linear ft.)	0.0	0.0	0.0	0.0
Amount of Wall Space (640 sq. ft.)	160.0	0.0	0.0	0.0
Other:				
Tables	12			
Animal cages	40			
VOLUME TOTALS:	307.0	0.0	0.0	0.0

Note: Quantity is the total volume under consideration.

Note: None of the items are expected to be contaminated.

Table 3 DECONTAMINATION and/or DISMANTLING of RADIOACTIVE FACILITY COMPONENTS	Facility Name: NRC License No.: Room or Area:	The Liposome Company 29-19918-01 Bacteriology

Assumptions for this area:

10CFR61 Waste Class:	Disposal	Decon
% Class A	100.0%	100.0%
% Class B	0.0%	0.0%
% Class C	0.0%	0.0%
Disposal vs. Decon Estimates:		
% Contaminated Walls	0.0%	0.0%
% Contaminated Floors	0.0%	0.0%
% Contaminated Ductwork	0.0%	0.0%
% Contaminated Sinks & Drains	0.0%	0.0%
% Contaminated Hoods	0.0%	0.0%
% Contaminated Equip. (See Below)	0.0%	0.0%

Volume Estimates (cubic feet):

		10CFR Part 61 Waste Class		
Item:	Quantity	Class A	Class B	Class C
Glove Boxes	0.0	0.0	0.0	0.0
Fume Hoods	64.0	0.0	0.0	0.0
Hot Cells	0.0	0.0	0.0	0.0
Lab Benches	50.0	0.0	0.0	0.0
Sink and Drains	1.0	0.0	0.0	0.0
Amount of Floor Space (280 sq. ft.)	70.0	0.0	0.0	0.0
Ventillation Ductwork (0 linear ft.)	0.0	0.0	0.0	0.0
Amount of Wall Space (320 sq. ft.)	80.0	0.0	0.0	0.0
Other:				
VOLUME TOTALS:	265.0	0.0	0.0	0.0

Note: Quantity is the total volume under consideration.

Note: None of the items are expected to be contaminated.

Table 3 DECONTAMINATION and/or DISMANTLING of RADIOACTIVE FACILITY COMPONENTS	Facility Name: NRC License No.: Room or Area:	The Liposome Company 29-19918-01 The Cold Room

Assumptions for this area:

10CFR61 Waste Class:	Disposal	Decon
% Class A	100.0%	100.0%
% Class B	0.0%	0.0%
% Class C	0.0%	0.0%
Disposal vs. Decon Estimates:		
% Contaminated Walls	0.0%	0.0%
% Contaminated Floors	0.0%	0.0%
% Contaminated Ductwork	0.0%	0.0%
% Contaminated Sinks & Drains	0.0%	0.0%
% Contaminated Hoods	0.0%	0.0%
% Contaminated Equip. (See Below)	0.0%	0.0%

Volume Estimates (cubic feet):

		10CFR Part 61 Waste Class		
Item:	Quantity	Class A	Class B	Class C
Glove Boxes	0.0	0.0	0.0	0.0
Fume Hoods	64.0	0.0	0.0	0.0
Hot Cells	0.0	0.0	0.0	0.0
Lab Benches	50.0	0.0	0.0	0.0
Sink and Drains	1.0	0.0	0.0	0.0
Amount of Floor Space (100 sq. ft.)	25.0	0.0	0.0	0.0
Ventillation Ductwork (0 linear ft.)	0.0	0.0	0.0	0.0
Amount of Wall Space (100 sq. ft.)	25.0	0.0	0.0	0.0
Other:				
Shelves	40			
VOLUME TOTALS:	205.0	0.0	0.0	0.0

Note: Quantity is the total volume under consideration.

Note: None of the items are expected to be contaminated.

Table 3 DECONTAMINATION and/or DISMANTLING of RADIOACTIVE FACILITY COMPONENTS	Facility Name: NRC License No.: Room or Area:	The Liposome Company 29-19918-01 Waste Room

Assumptions for this area:

10CFR61 Waste Class:	Disposal	Decon
% Class A	100.0%	100.0%
% Class B	0.0%	0.0%
% Class C	0.0%	0.0%
Disposal vs. Decon Estimates:		
% Contaminated Walls	0.0%	0.0%
% Contaminated Floors	0.0%	0.0%
% Contaminated Ductwork	0.0%	0.0%
% Contaminated Sinks & Drains	0.0%	0.0%
% Contaminated Hoods	0.0%	0.0%
% Contaminated Equip. (See Below)	10.0%	90.0%

Volume Estimates (cubic feet):

		10CFR Part 61 Waste Class		
Item:	Quantity	Class A	Class B	Class C
Glove Boxes	0.0	0.0	0.0	0.0
Fume Hoods	0.0	0.0	0.0	0.0
Hot Cells	0.0	0.0	0.0	0.0
Lab Benches	20.0	0.0	0.0	0.0
Sink and Drains	0.0	0.0	0.0	0.0
Amount of Floor Space (150 sq. ft.)	40.0	0.0	0.0	0.0
Ventillation Ductwork (0 linear ft.)	0.0	0.0	0.0	0.0
Amount of Wall Space (120 sq. ft.)	40.0	0.0	0.0	0.0
Other:				
3 x 30 cf Refrigerators	90	13.0		
VOLUME TOTALS:	190.0	13.0	0.0	0.0

Note: Quantity is the total volume under consideration.

The inside of the refrigerators are expected to be contaminated.

Table 3 DECONTAMINATION and/or DISMANTLING of RADIOACTIVE FACILITY COMPONENTS	Facility Name: NRC License No.: Room or Area:	The Liposome Company 29-19918-01 Main Lab B

Assumptions for this area:

10CFR61 Waste Class:	Disposal	Decon
% Class A	100.0%	100.0%
% Class B	0.0%	0.0%
% Class C	0.0%	0.0%
Disposal vs. Decon Estimates:		
% Contaminated Walls	0.0%	0.0%
% Contaminated Floors	0.0%	0.0%
% Contaminated Ductwork	0.0%	0.0%
% Contaminated Sinks & Drains	10.0%	0.0%
% Contaminated Hoods	0.0%	0.0%
% Contaminated Equip. (See Below)	0.0%	0.0%

Volume Estimates (cubic feet):

Item:	Quantity	10CFR Part 61 Waste Class Class A	Class B	Class C
Glove Boxes	0.0	0.0	0.0	0.0
Fume Hoods	24.0	0.0	0.0	0.0
Hot Cells	0.0	0.0	0.0	0.0
Lab Benches	300.0	0.0	0.0	0.0
Sink and Drains	10.0	1.0	0.0	0.0
Amount of Floor Space (1280 sq. ft.)	320.0	0.0	0.0	0.0
Ventillation Ductwork (40 linear ft.)	0.0	0.0	0.0	0.0
Amount of Wall Space (600 sq. ft.)	150.0	0.0	0.0	0.0
Other:				
VOLUME TOTALS:	804.0	1.0	0.0	0.0

Note: Quantity is the total volume under consideration.

Note: Some of the sinks are expected to be contaminated.

Table 3
DECONTAMINATION and/or DISMANTLING of RADIOACTIVE FACILITY COMPONENTS

Facility Name: The Liposome Company
NRC License No.: 29-19918-01
Room or Area: Shipping/Receiving Area

Assumptions for this area:

10CFR61 Waste Class:	Disposal	Decon
% Class A	100.0%	100.0%
% Class B	0.0%	0.0%
% Class C	0.0%	0.0%
Disposal vs. Decon Estimates:		
% Contaminated Walls	0.0%	0.0%
% Contaminated Floors	0.0%	0.0%
% Contaminated Ductwork	0.0%	0.0%
% Contaminated Sinks & Drains	0.0%	0.0%
% Contaminated Hoods	0.0%	0.0%
% Contaminated Equip. (See Below)	0.0%	0.0%

Volume Estimates (cubic feet):

Item:	Quantity	10CFR Part 61 Waste Class: Class A	Class B	Class C
Glove Boxes	0.0	0.0	0.0	0.0
Fume Hoods	0.0	0.0	0.0	0.0
Hot Cells	0.0	0.0	0.0	0.0
Lab Benches	30.0	0.0	0.0	0.0
Sink and Drains	0.0	0.0	0.0	0.0
Amount of Floor Space (100 sq. ft.)	25.0	0.0	0.0	0.0
Ventillation Ductwork (0 linear ft.)	0.0	0.0	0.0	0.0
Amount of Wall Space (100 sq. ft.)	25.0	0.0	0.0	0.0
Other:				
Shelves	10			
Refrigerator	30			
VOLUME TOTALS	120.0	0.0	0.0	0.0

Note: Quantity is the total volume under consideration.

Note: None of the items are expected to be contaminated.

Table 3
DECONTAMINATION and/or DISMANTLING of RADIOACTIVE FACILITY COMPONENTS

Facility Name: The Liposome Company
NRC License No.: 28-19918-01
Room or Area: Main Lab Hall

Assumptions for this area:

10CFR61 Waste Class:	Disposal	Decon
% Class A	100.0%	100.0%
% Class B	0.0%	0.0%
% Class C	0.0%	0.0%
Disposal vs. Decon Estimates:		
% Contaminated Walls	0.0%	0.0%
% Contaminated Floors	0.0%	0.0%
% Contaminated Ductwork	0.0%	0.0%
% Contaminated Sinks & Drains	0.0%	0.0%
% Contaminated Hoods	0.0%	0.0%
% Contaminated Equip. (See Below)	0.0%	0.0%

Volume Estimates (cubic feet):

		10CFR Part 61 Waste Class		
Item:	Quantity	Class A	Class B	Class C
Glove Boxes	0.0	0.0	0.0	0.0
Fume Hoods	0.0	0.0	0.0	0.0
Hot Cells	0.0	0.0	0.0	0.0
Lab Benches	0.0	0.0	0.0	0.0
Sink and Drains	0.0	0.0	0.0	0.0
Amount of Floor Space (144 sq. ft.)	36.0	0.0	0.0	0.0
Ventillation Ductwork (0 linear ft.)	0.0	0.0	0.0	0.0
Amount of Wall Space (100 sq. ft.)	25.0	0.0	0.0	0.0
Other:				
Liquid Scintillation Counter	48			
VOLUME TOTALS:	109.0	0.0	0.0	0.0

Note: Quantity is the total volume under consideration.

Note: None of the items are expected to be contaminated.

Table 3
DECONTAMINATION and/or DISMANTLING of RADIOACTIVE FACILITY COMPONENTS

Facility Name: The Liposome Company
NRC License No.: 29-19918-01
Room or Area: Instrument Hall

Assumptions for this area:

10CFR61 Waste Class:	Disposal	Decon
% Class A	100.0%	100.0%
% Class B	0.0%	0.0%
% Class C	0.0%	0.0%
Disposal vs. Decon Estimates:		
% Contaminated Walls	0.0%	0.0%
% Contaminated Floors	0.0%	0.0%
% Contaminated Ductwork	0.0%	0.0%
% Contaminated Sinks & Drains	0.0%	0.0%
% Contaminated Hoods	0.0%	0.0%
% Contaminated Equip. (See Below)	10.0%	90.0%

Volume Estimates (cubic feet):

Item:	Quantity	10CFR Part 61 Waste Class: Class A	Class B	Class C
Glove Boxes	0.0	0.0	0.0	0.0
Fume Hoods	0.0	0.0	0.0	0.0
Hot Cells	0.0	0.0	0.0	0.0
Lab Benches	0.0	0.0	0.0	0.0
Sink and Drains	0.0	0.0	0.0	0.0
Amount of Floor Space (160 sq. ft.)	40.0	0.0	0.0	0.0
Ventillation Ductwork (0 linear ft.)	0.0	0.0	0.0	0.0
Amount of Wall Space (64 sq. ft.)	16.0	0.0	0.0	0.0
Other:				
Liquid Scintillation Counter	48	5.0		
Gamma Counter	48	0		
2 x Centrifuge	54	7		
Vacuum Oven	8	0		
VOLUME TOTALS:	214.0	12.0	0.0	0.0

Note: Quantity is the total volume under consideration.

Note: The LSC and centrifuges are expected to be contaminated.

Table 3 DECONTAMINATION and/or DISMANTLING of RADIOACTIVE FACILITY COMPONENTS	Facility Name: NRC License No.: Room or Area:	The Liposome Company 29-19918-01 Laboratory Prep Room

Assumptions for this area:

10CFR61 Waste Class:	Disposal	Decon
% Class A	100.0%	100.0%
% Class B	0.0%	0.0%
% Class C	0.0%	0.0%
Disposal vs. Decon Estimates:		
% Contaminated Walls	0.0%	0.0%
% Contaminated Floors	0.0%	0.0%
% Contaminated Ductwork	0.0%	0.0%
% Contaminated Sinks & Drains	0.0%	0.0%
% Contaminated Hoods	0.0%	0.0%
% Contaminated Equip. (See Below)	0.0%	0.0%

Volume Estimates (cubic feet):

		10CFR Part 61 Waste Class		
Item:	Quantity	Class A	Class B	Class C
Glove Boxes	0.0	0.0	0.0	0.0
Fume Hoods	0.0	0.0	0.0	0.0
Hot Cells	0.0	0.0	0.0	0.0
Lab Benches	15.0	0.0	0.0	0.0
Sink and Drains	2.0	0.0	0.0	0.0
Amount of Floor Space (360 sq. ft.)	90.0	0.0	0.0	0.0
Ventillation Ductwork (0 linear ft.)	0.0	0.0	0.0	0.0
Amount of Wall Space (120 sq. ft.)	40.0	0.0	0.0	0.0
Other:				
Turbo Bottle Washer	96	0.0		
VOLUME TOTALS:	243.0	0.0	0.0	0.0

Note: Quantity is the total volume under consideration.

Note: None of the items are expected to be contaminated.

Table 3 DECONTAMINATION and/or DISMANTLING of RADIOACTIVE FACILITY COMPONENTS	Facility Name: NRC License No.: Room or Area:	The Liposome Company 28-19918-01 Organic Lab

Assumptions for this area:

10CFR61 Waste Class:	Disposal	Decon
% Class A	100.0%	100.0%
% Class B	0.0%	0.0%
% Class C	0.0%	0.0%
Disposal vs. Decon Estimates:		
% Contaminated Walls	0.0%	0.0%
% Contaminated Floors	0.0%	0.0%
% Contaminated Ductwork	0.0%	0.0%
% Contaminated Sinks & Drains	0.0%	0.0%
% Contaminated Hoods	0.0%	0.0%
% Contaminated Equip. (See Below)	0.0%	0.0%

Volume Estimates (cubic feet):

		10CFR Part 61 Waste Class		
Item:	Quantity	Class A	Class B	Class C
Glove Boxes	0.0	0.0	0.0	0.0
Fume Hoods	24.0	0.0	0.0	0.0
Hot Cells	0.0	0.0	0.0	0.0
Lab Benches	80.0	0.0	0.0	0.0
Sink and Drains	1.0	0.0	0.0	0.0
Amount of Floor Space (192 sq. ft.)	48.0	0.0	0.0	0.0
Ventillation Ductwork (0 linear ft.)	0.0	0.0	0.0	0.0
Amount of Wall Space (120 sq. ft.)	40.0	0.0	0.0	0.0
Other:				
		0.0		
VOLUME TOTALS:	193.0	0.0	0.0	0.0

Note: Quantity is the total volume under consideration.

Note: None of the items are expected to be contaminated.

Table 3 DECONTAMINATION and/or DISMANTLING of RADIOACTIVE FACILITY COMPONENTS	Facility Name: NRC License No.: Room or Area:	The Liposome Company 29-19918-01 Main Lab C

Assumptions for this area:

10CFR61 Waste Class:	Disposal	Decon
% Class A	100.0%	100.0%
% Class B	0.0%	0.0%
% Class C	0.0%	0.0%
Disposal vs. Decon Estimates:		
% Contaminated Walls	0.0%	0.0%
% Contaminated Floors	0.0%	0.0%
% Contaminated Ductwork	0.0%	0.0%
% Contaminated Sinks & Drains	10.0%	90.0%
% Contaminated Hoods	0.0%	0.0%
% Contaminated Equip. (See Below)	10.0%	90.0%

Volume Estimates (cubic feet):

		10CFR Part 61 Waste Class		
Item:	Quantity	Class A	Class B	Class C
Glove Boxes	0.0	0.0	0.0	0.0
Fume Hoods	96.0	0.0	0.0	0.0
Hot Cells	0.0	0.0	0.0	0.0
Lab Benches	250.0	0.0	0.0	0.0
Sink and Drains	3.0	1.0	0.0	0.0
Amount of Floor Space (1600 sq. ft.)	400.0	0.0	0.0	0.0
Ventillation Ductwork (40 linear ft.)	40.0	0.0	0.0	0.0
Amount of Wall Space (360 sq. ft.)	90.0	0.0	0.0	0.0
Other:				
3 x Centrifuges	81	10.0		
3 x Refrigerators	90	14		
2 x Laboratory Balance	4	2		
VOLUME TOTALS:	1054.0	27.0	0.0	0.0

Note: Quantity is the total volume under consideration.

Note: These items are expected to be slightly contaminated.

Table 3
DECONTAMINATION and/or DISMANTLING of RADIOACTIVE FACILITY COMPONENTS

Facility Name: The Liposome Company
NRC License No.: 29-19918-01
Room or Area: Cell Culture

Assumptions for this area:

10CFR61 Waste Class:	Disposal	Decon
% Class A	100.0%	100.0%
% Class B	0.0%	0.0%
% Class C	0.0%	0.0%
Disposal vs. Decon Estimates:		
% Contaminated Walls	0.0%	0.0%
% Contaminated Floors	0.0%	0.0%
% Contaminated Ductwork	0.0%	0.0%
% Contaminated Sinks & Drains	0.0%	0.0%
% Contaminated Hoods	0.0%	0.0%
% Contaminated Equip. (See Below)	0.0%	0.0%

Volume Estimates (cubic feet):

Item:	Quantity	10CFR Part 61 Waste Class: Class A	Class B	Class C
Glove Boxes	0.0	0.0	0.0	0.0
Fume Hoods	24.0	0.0	0.0	0.0
Hot Cells	0.0	0.0	0.0	0.0
Lab Benches	60.0	0.0	0.0	0.0
Sink and Drains	0.0	0.0	0.0	0.0
Amount of Floor Space (280 sq. ft.)	70.0	0.0	0.0	0.0
Ventillation Ductwork (0 linear ft.)	0.0	0.0	0.0	0.0
Amount of Wall Space (160 sq. ft.)	40.0	0.0	0.0	0.0
Other:				
VOLUME TOTALS:	194.0	0.0	0.0	0.0

Note: Quantity is the total volume under consideration.

Note: None of the items are expected to be contaminated.

TABLE 4 Equipment Costs			Facility Name: NRC License No.:	The Liposome Company 29-19918-01
	Rental per day	Days	Rental Total	
Equipment/Supply:				
Health Physics Monitoring Equipment	$150.00	6	$900.00	

TABLE 5 Rad. Waste Disposal Costs		Facility Name: NRC License No.:		The Liposome Company 29-19818-01			
Container Type	Type	Vol.(ft3)	Quantity	Unit Cost	Total Cost	Total Vol.	
Task 2 - 55 gallon steel drums	A	7.50	7	$925.00	$6,475	52.5	
Task 5 - 55 gallon steel drums	A	7.50	7	$800.00	$5,600	52.5	
Totals	A				$12,075	105.0	

Note: Task 5 wastes will be compacted prior to burial.

TABLE 6 Summary of Costs		Facility Name: NRC License No.:	The Liposome Company 29-19918-01
Total Labor Costs (from Table 1)	$15,180		
Total Equipment Costs (from Table 4)	$900		
Total Radwaste Disposal Costs (from Table 5)	$12,075		
GRAND TOTAL:	**$28,155**		

ATTACHMENT G

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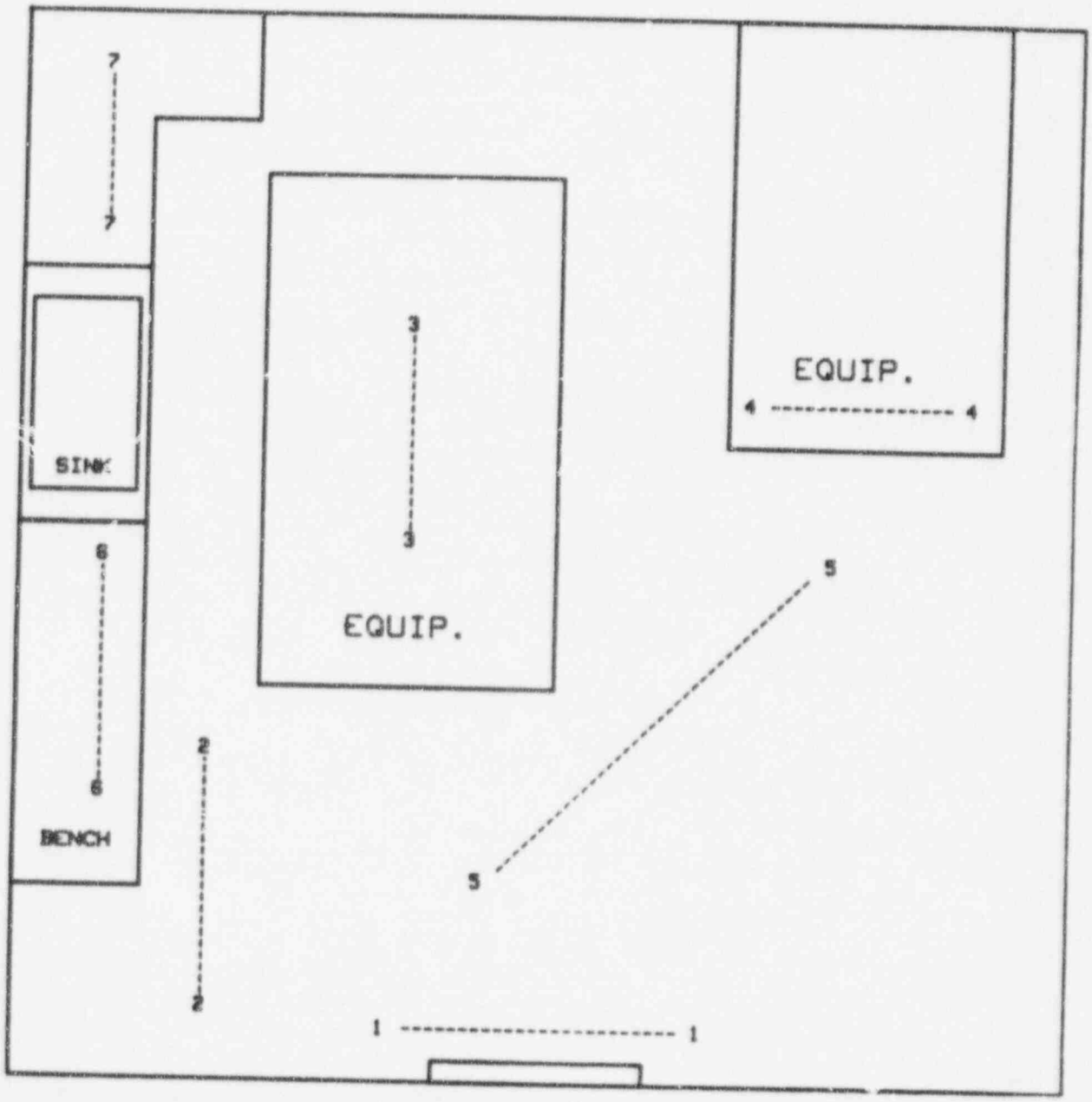
TELEDYNE ISOTOPES

DIAGRAM OF SURVEYED AREA

LOCATION: ANIMAL PREP ROOM

PRINCIPLE OCCUPANTS: KENCH, K.

ISOTOPE USAGE: H-3, Fe-59, C-14, I-125



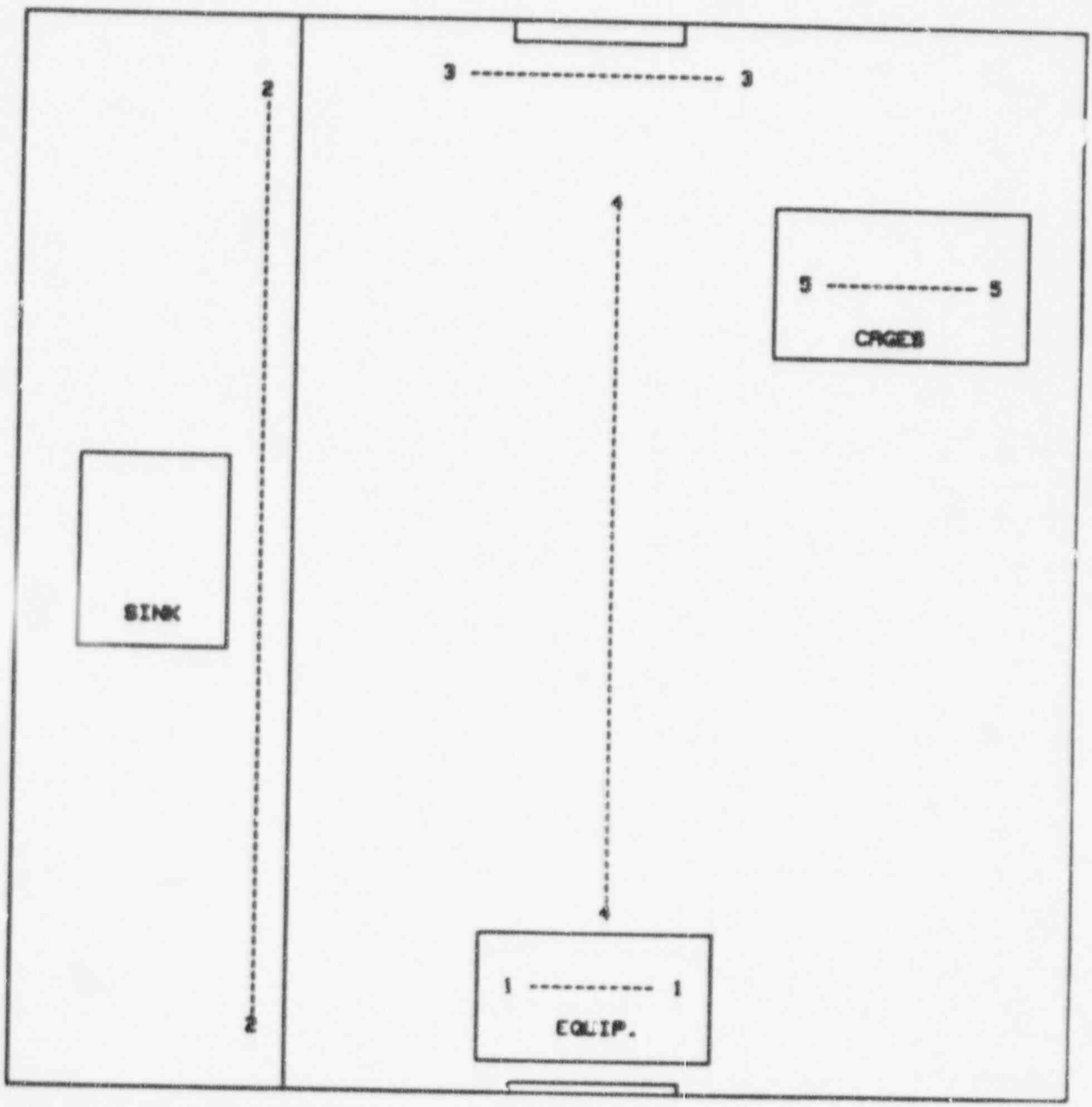
TELEDYNE ISOTOPES

DIAGRAM OF SURVEYED AREA

LOCATION: ROOM 108A

PRINCIPLE OCCUPANTS: SLUSHER, M.

ISOTOPE USAGE: I-125



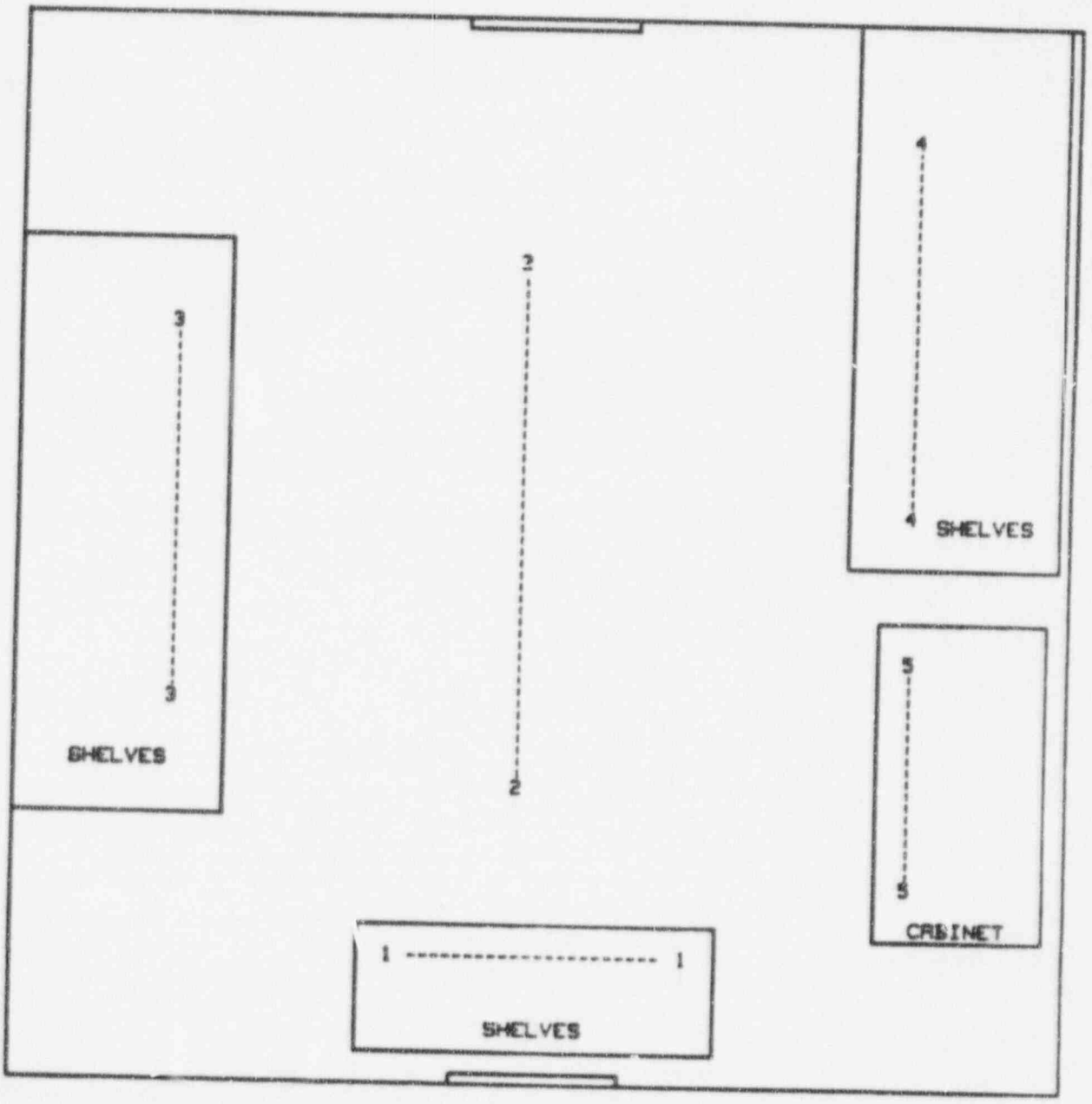
TELEDYNE ISOTOPES

DIAGRAM OF SURVEYED AREA

LOCATION: ROOM 100B STOCK ROOM

PRINCIPLE OCCUPANTS: KENCH, K.

ISOTOPE USAGE: I-125



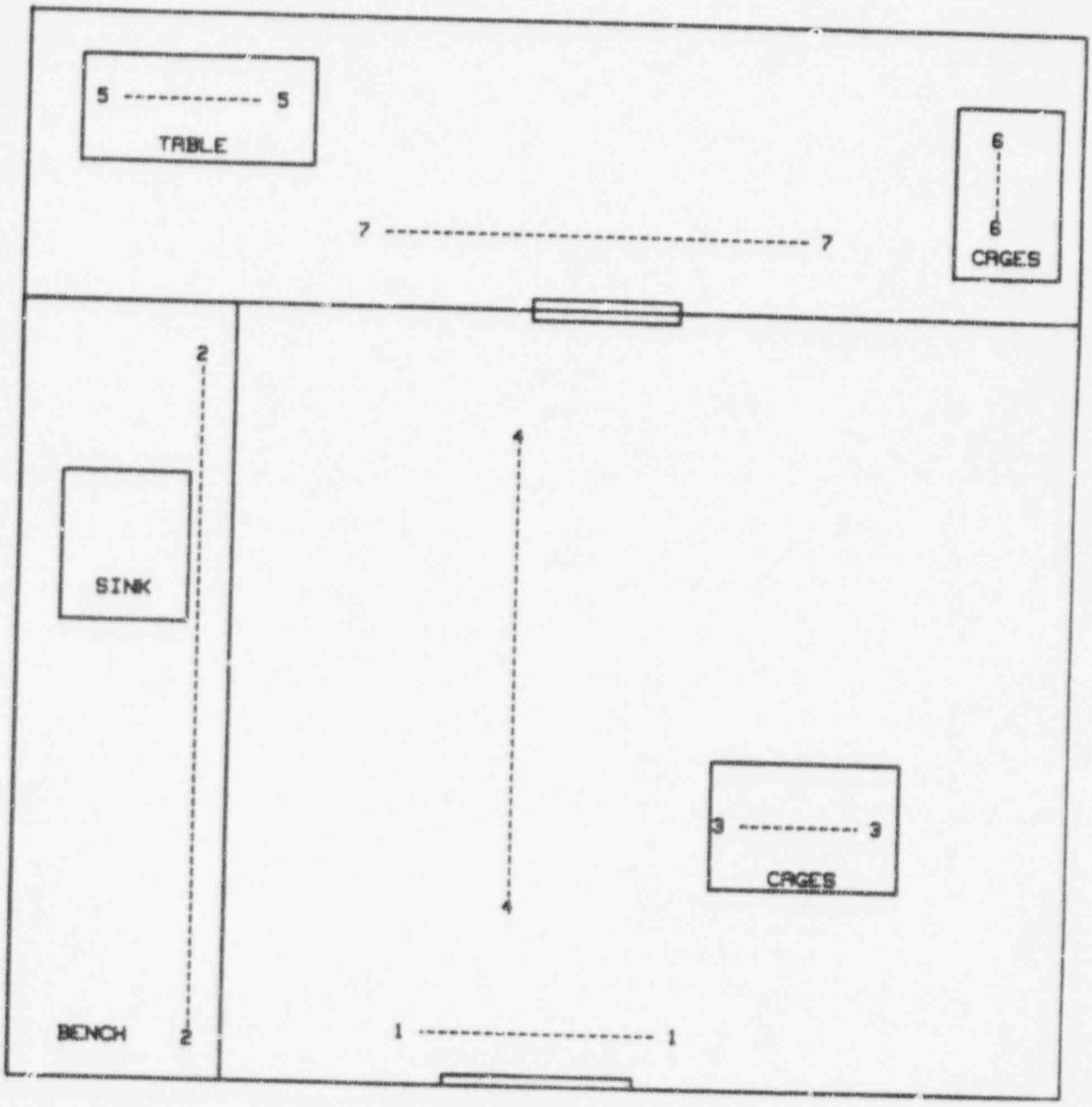
TELEDYNE ISOTOPES

DIAGRAM OF SURVEYED AREA

LOCATION: ROOM 101 A & B

PRINCIPLE OCCUPANTS: SLUSHER, M.
SHAW, B.

ISOTOPE USAGE: S-35, I-125



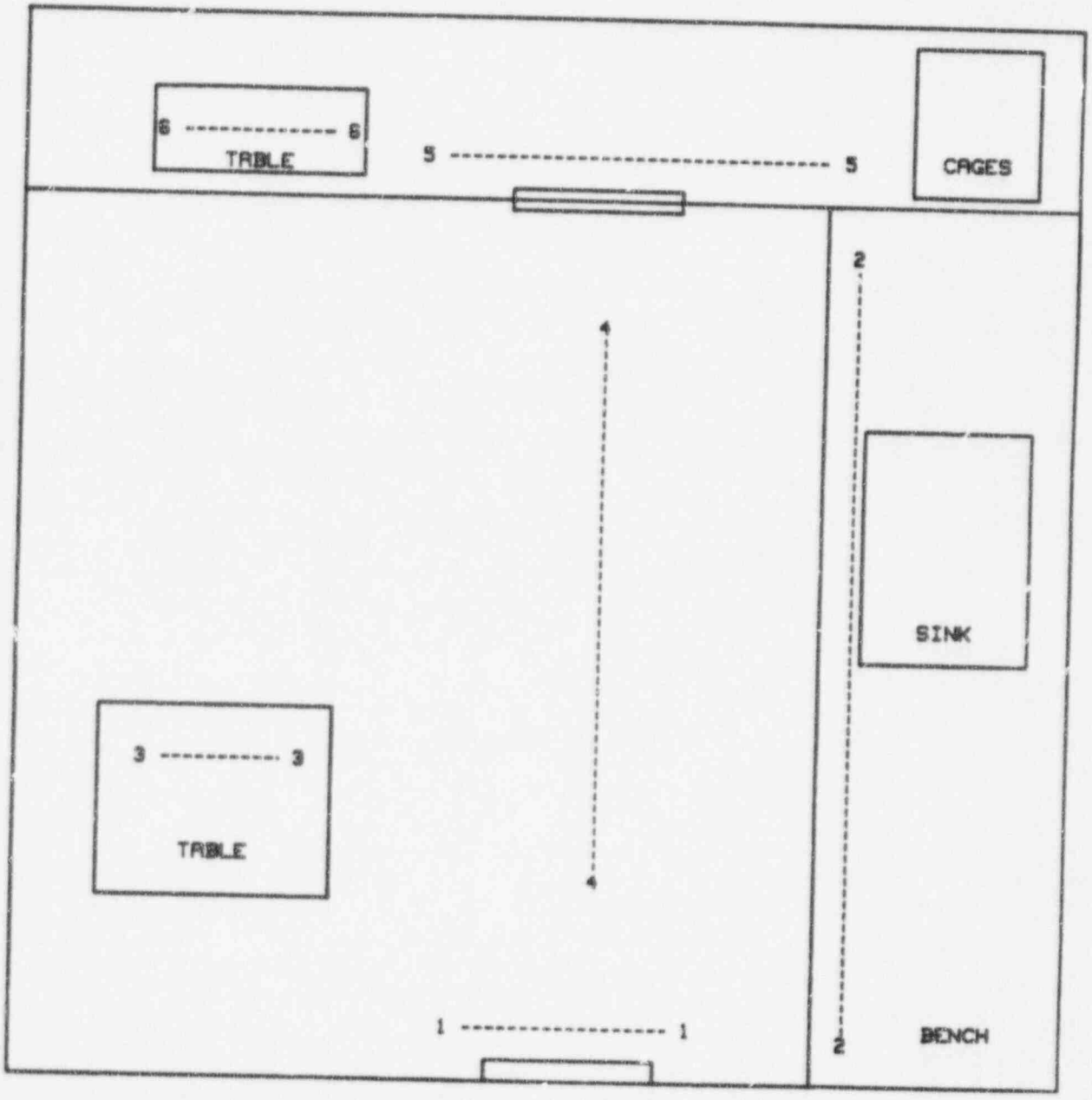
TELEDYNE ISOTOPES

DIAGRAM OF SURVEYED AREA

LOCATION: ROOM 102 A & B

PRINCIPLE OCCUPANTS: OPEN ACCESS

ISOTOPE USAGE: S-35, I-125



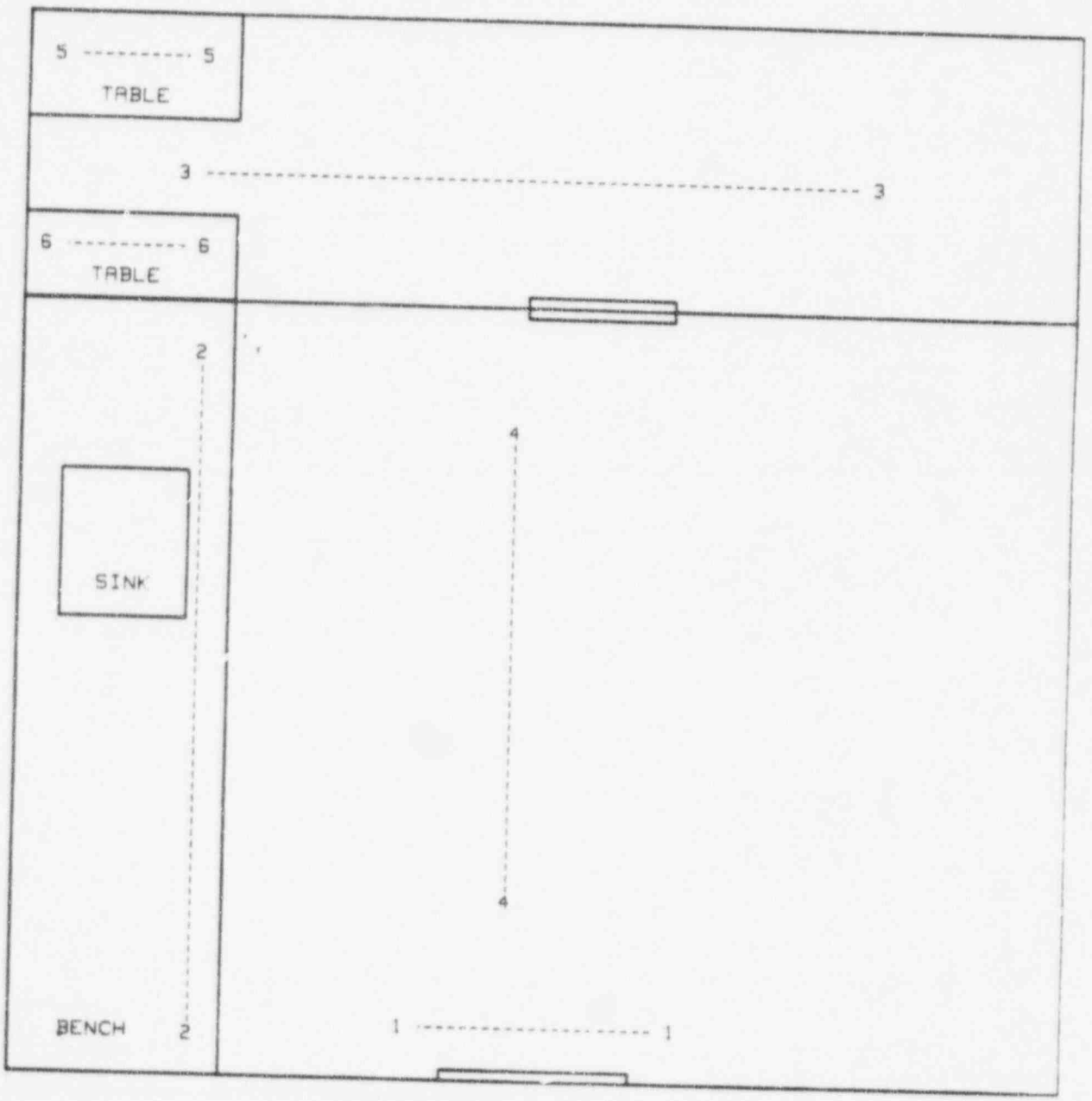
TELEDYNE ISOTOPES

DIAGRAM OF SURVEYED AREA

LOCATION: ROOM 103 A & B

PRINCIPLE OCCUPANTS: FRAZIER, D.
KENCH, K.

ISOTOPE USAGE: S-35, I-125



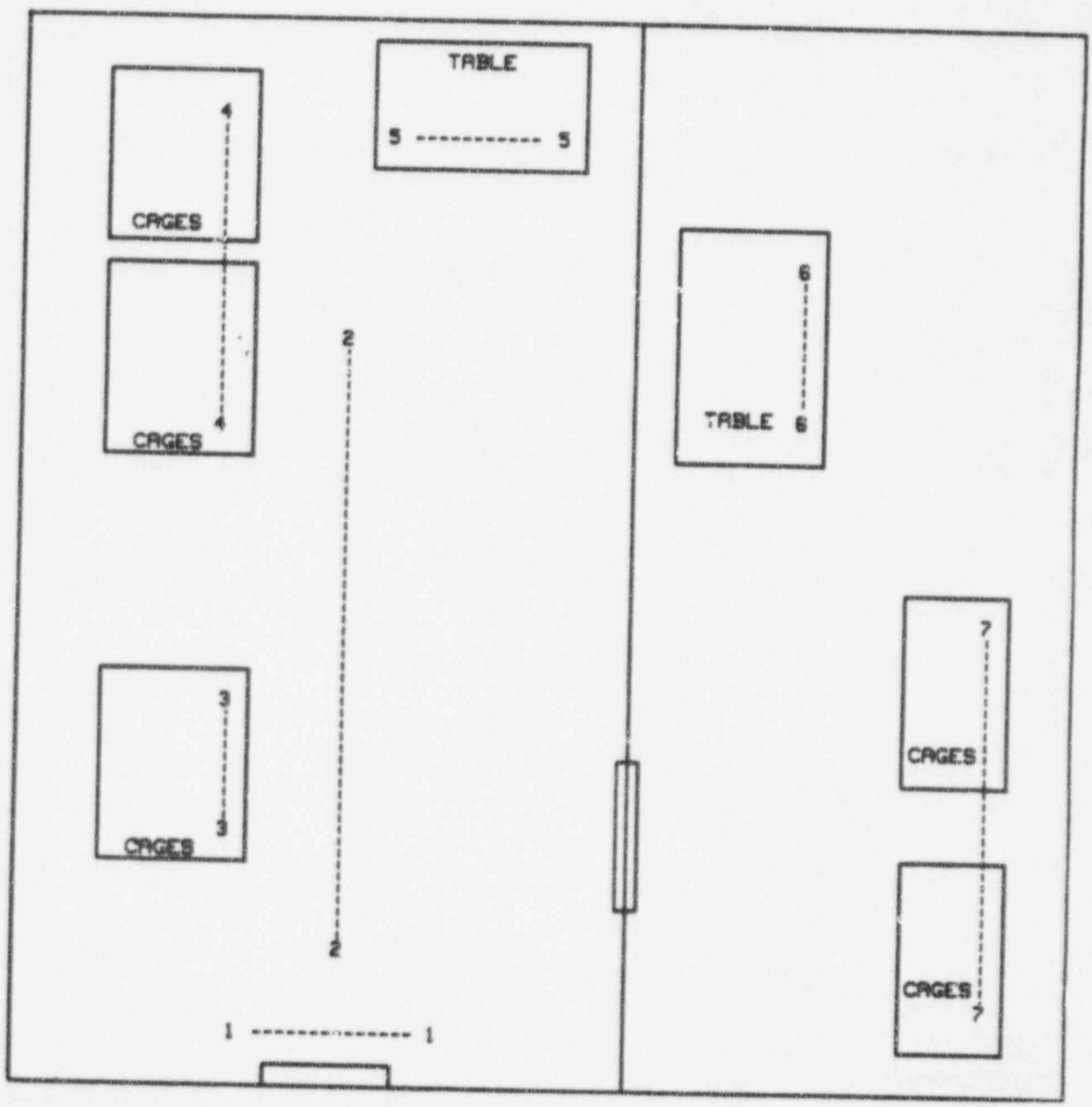
TELEDYNE ISOTOPES

DIAGRAM OF SURVEYED AREA

LOCATION: ROOM 104 A & B

PRINCIPLE OCCUPANTS: OPEN ACCESS

ISOTOPE USAGE: S-35, I-125, Cr-51



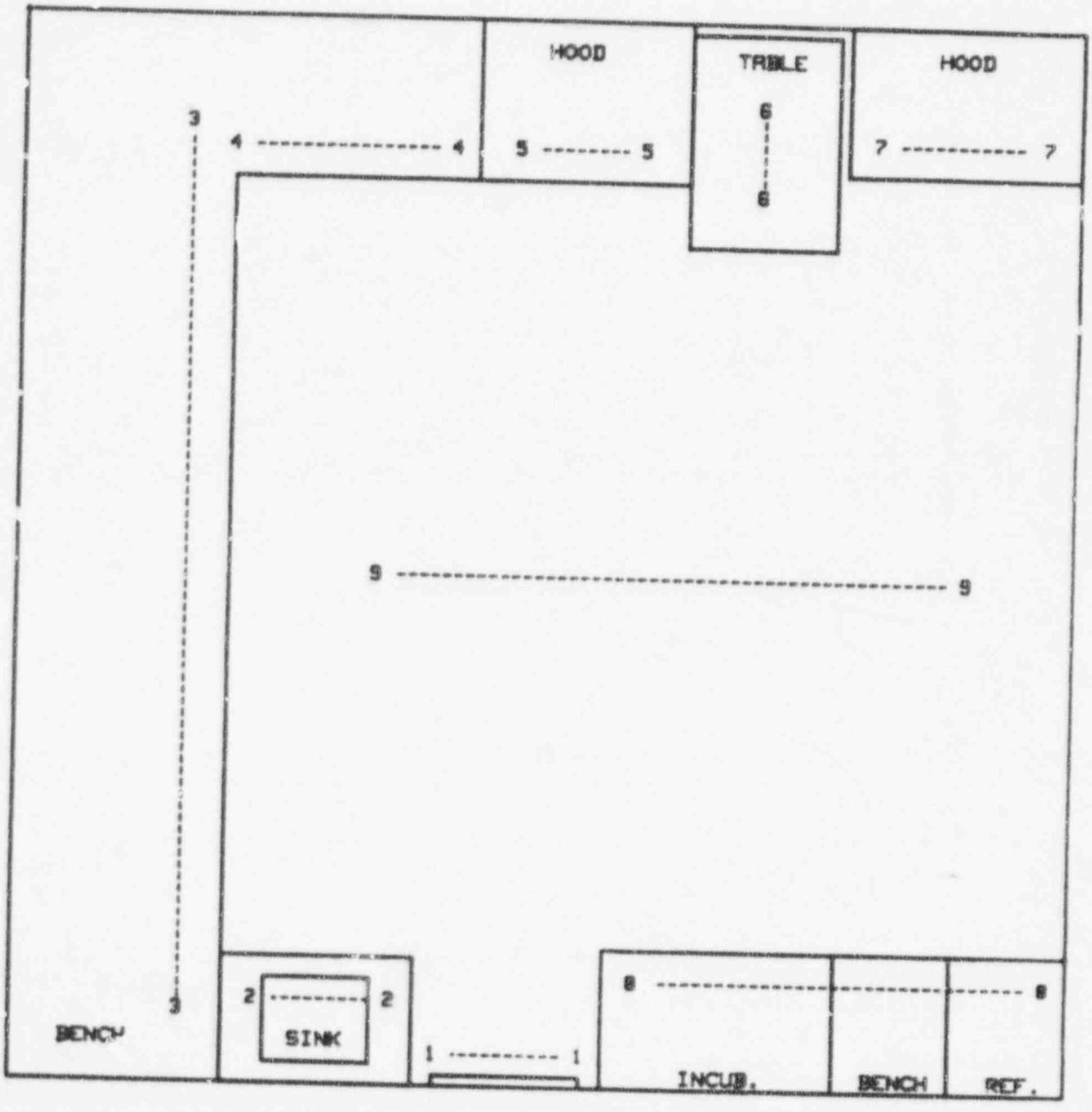
TELEDYNE ISOTOPES

DIAGRAM OF SURVEYED AREA

LOCATION: BACTERIOLOGY

PRINCIPLE OCCUPANTS: FRAZIER, D.
SCHULTZ, S.

ISOTOPE USAGE: H-3, Cr-51



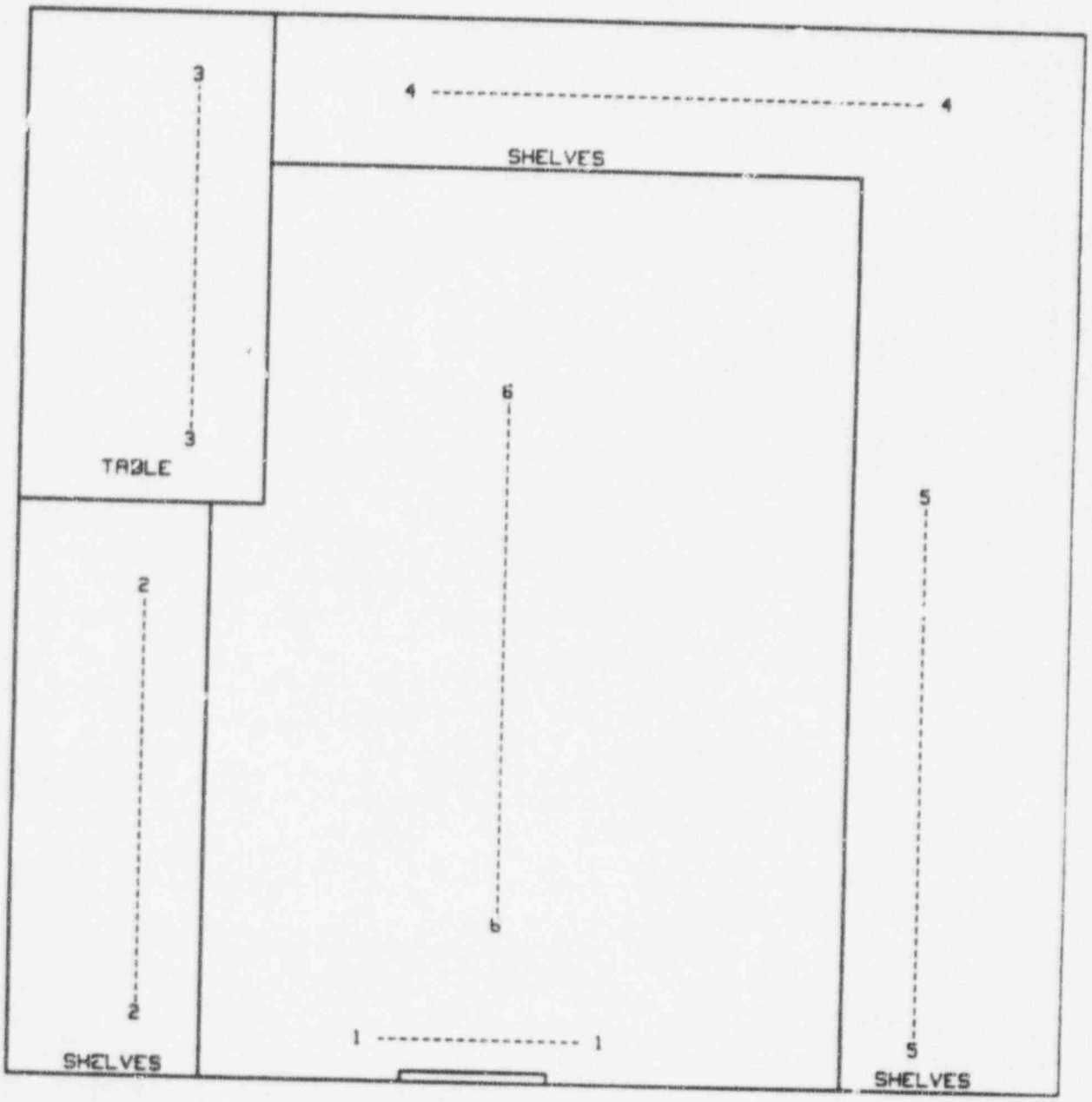
TELEDYNE ISOTOPES

DIAGRAM OF SURVEYED AREA

LOCATION: COLD ROOM

PRINCIPLE OCCUPANTS: OPEN ACCESS

ISOTOPE USAGE: H-3, I-125, C-14, Fe-59



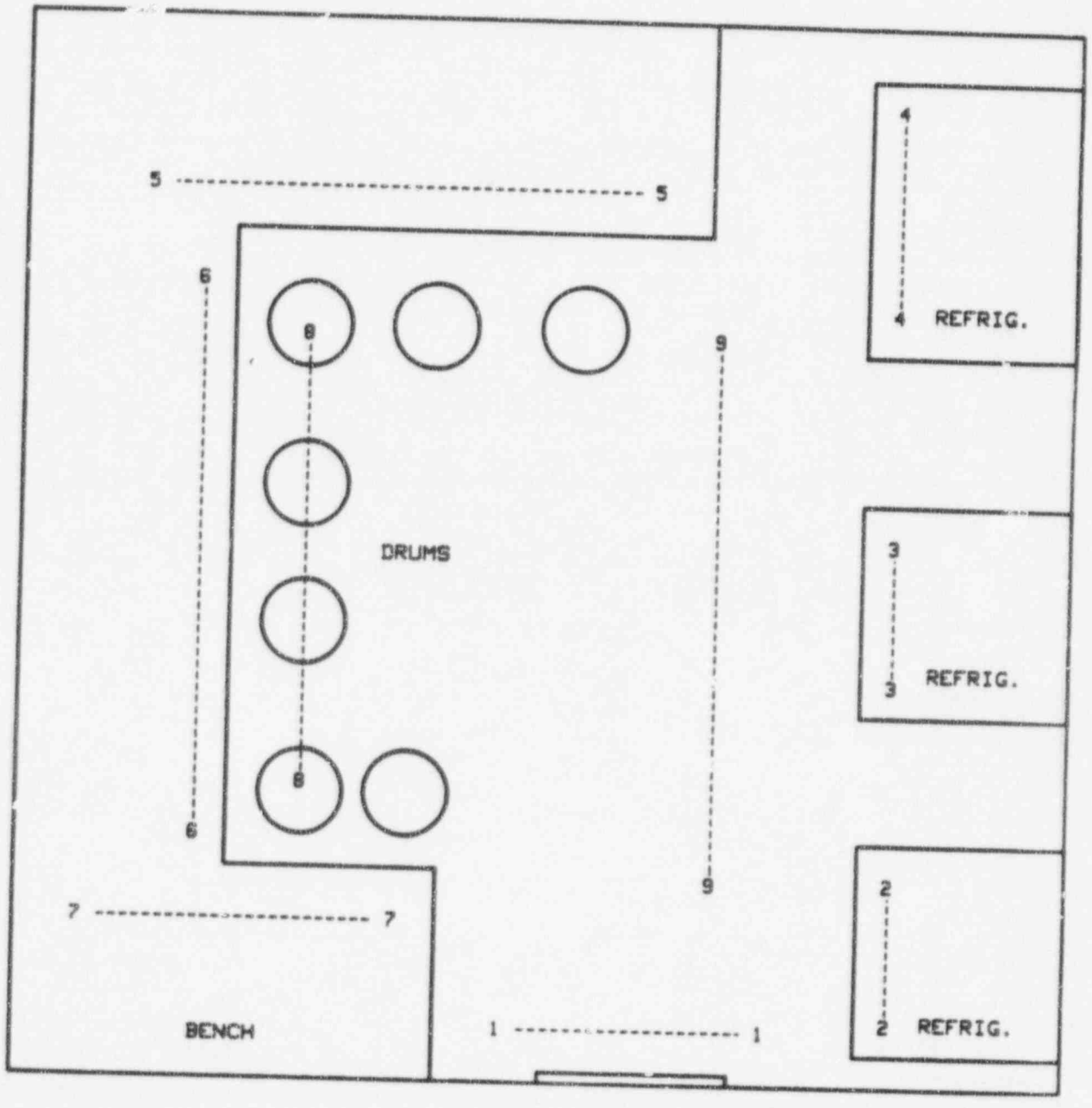
TELEDYNE ISOTOPES

DIAGRAM OF SURVEYED AREA

LOCATION: WASTE ROOM

PRINCIPLE OCCUPANTS: OPEN ACCESS

ISOTOPE USAGE: ALL



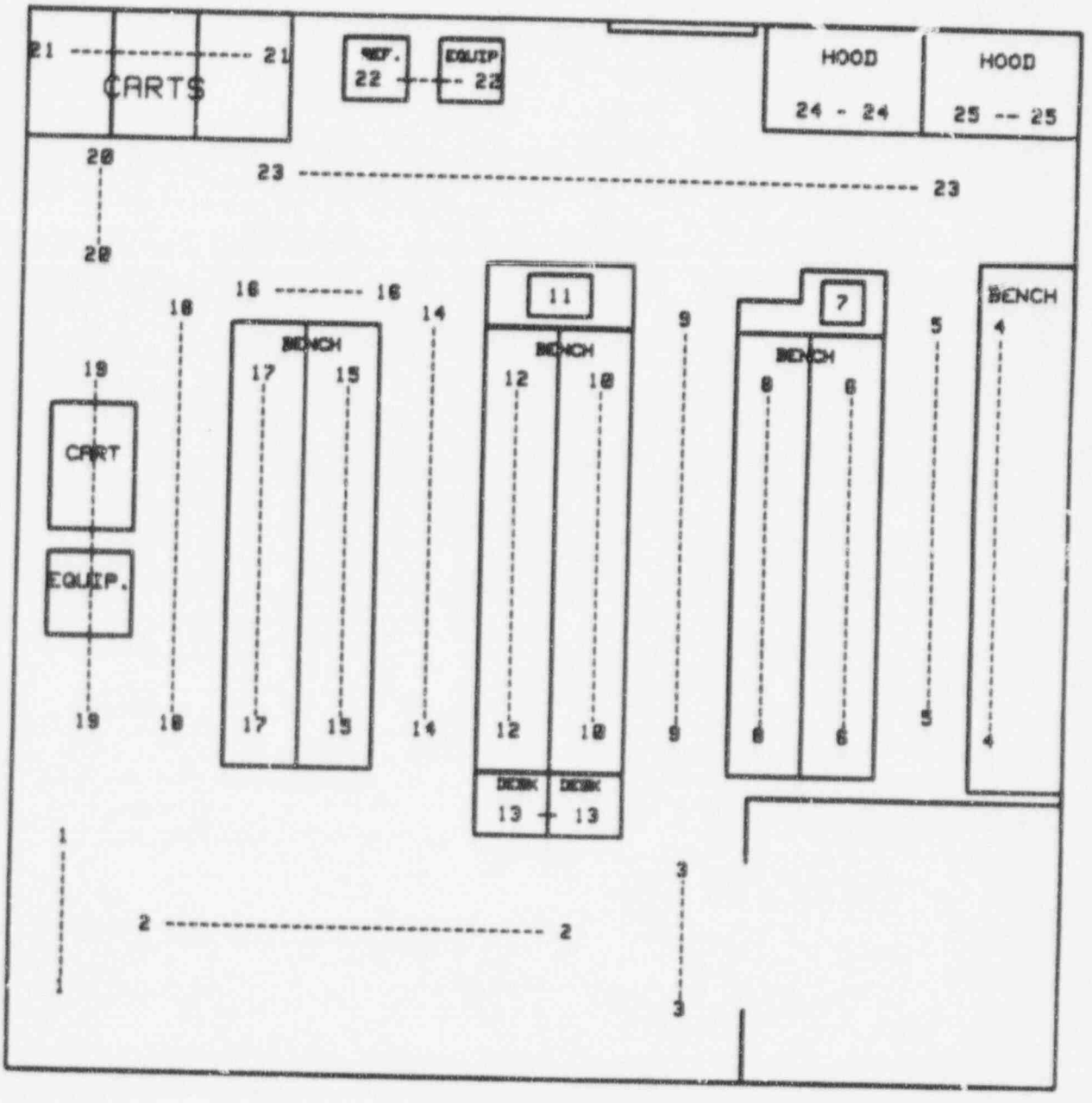
TELEDYNE ISOTOPES

DIAGRAM OF SURVEYED AREA

LOCATION: MAIN LABORATORY-B

PRINCIPLE OCCUPANTS: OPEN ACCESS

ISOTOPE USAGE: H-3, I-125, C-14, S-35, Cr-51, Fe-55



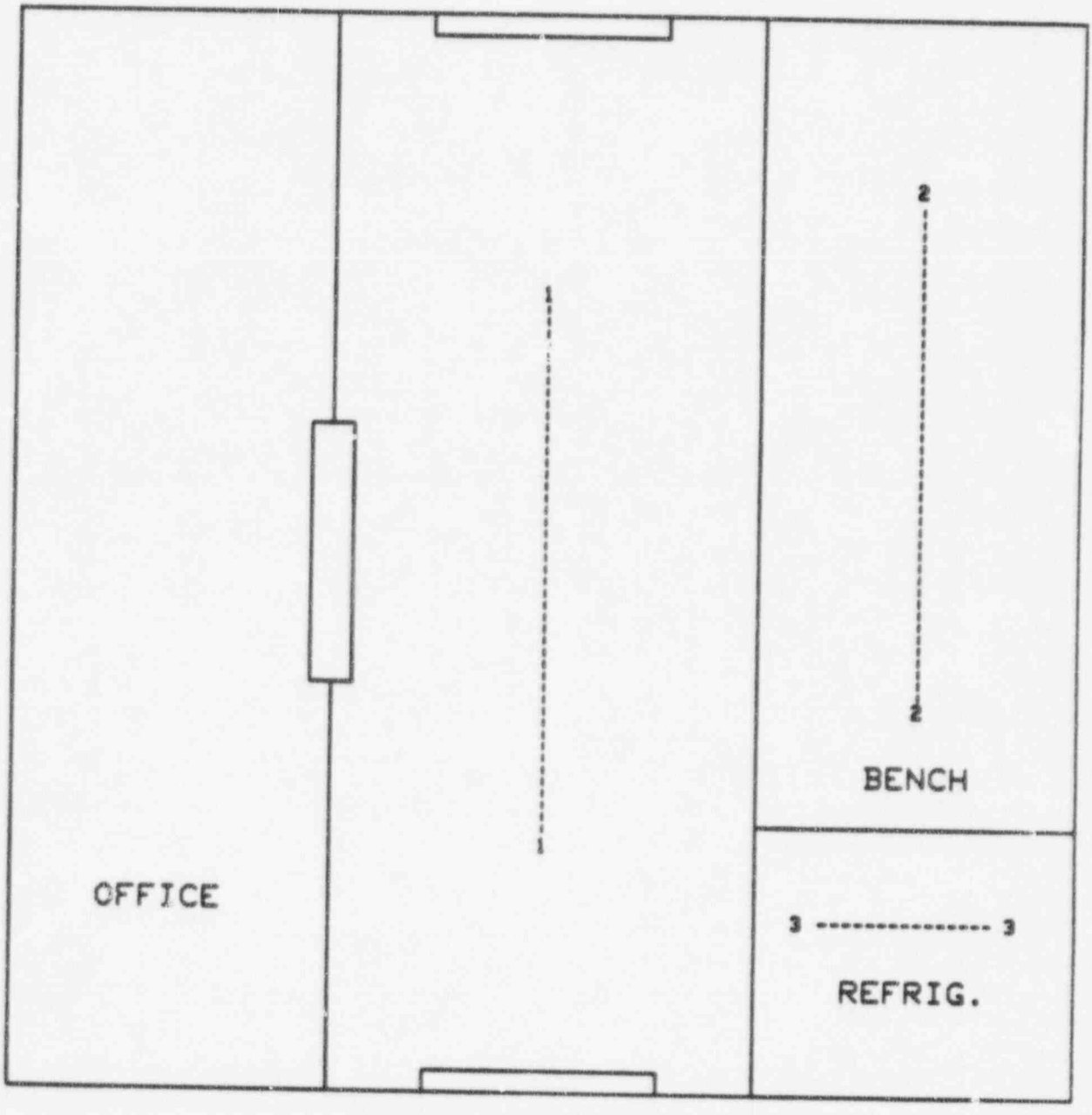
TELEDYNE ISOTOPES

DIAGRAM OF SURVEYED AREA

LOCATION: SHIPPING/RECEIVING AREA

PRINCIPLE OCCUPANTS: OPEN ACCESS

ISOTOPE USAGE:



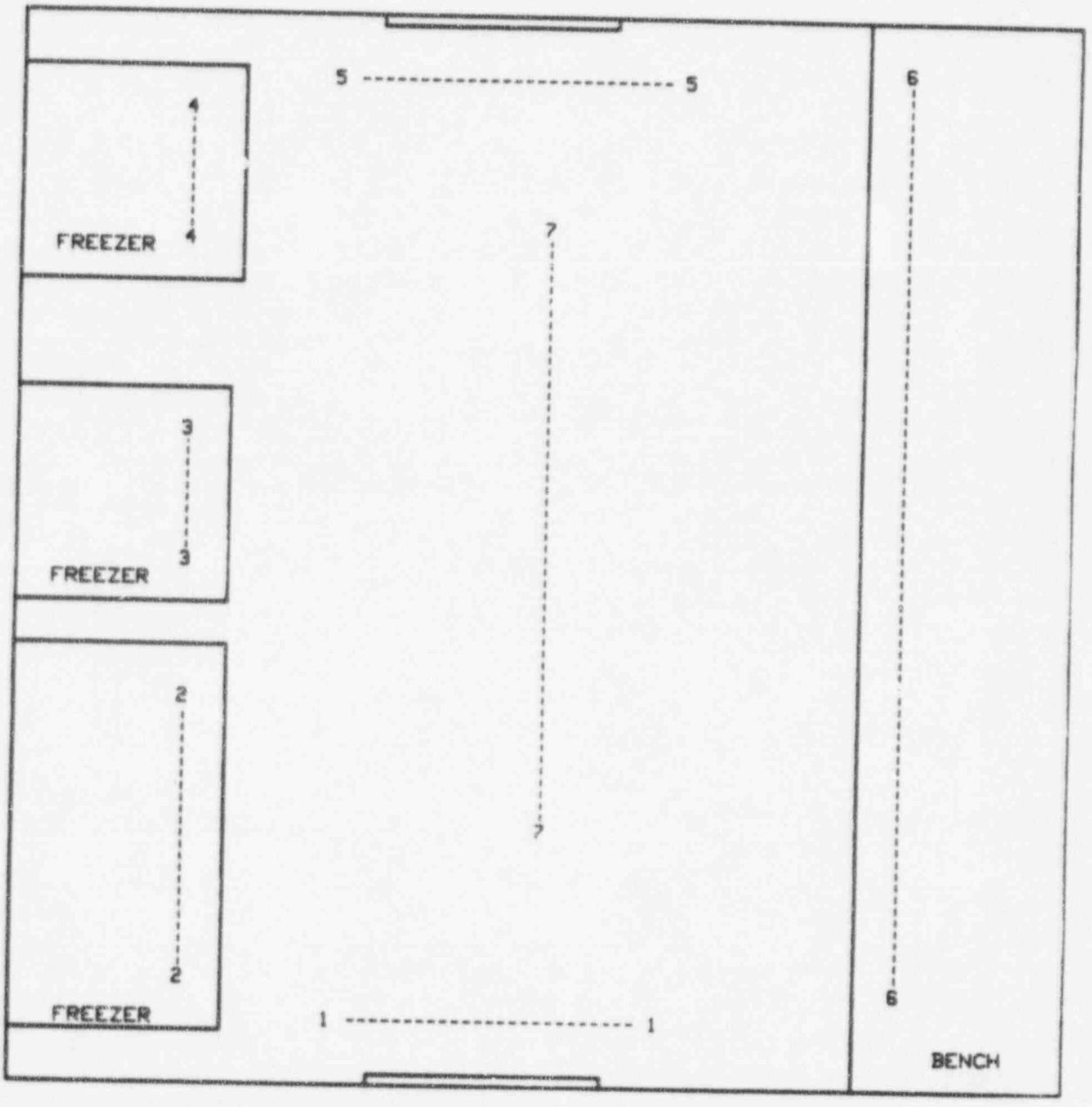
TELEDYNE ISOTOPES

DIAGRAM OF SURVEYED AREA

LOCATION: MAIN LABORATORY HALL

PRINCIPLE OCCUPANTS: OPEN ACCESS

ISOTOPE USAGE: H-3, C-14, Fe-59, I-125, Zn-65, S-35, Cr-51



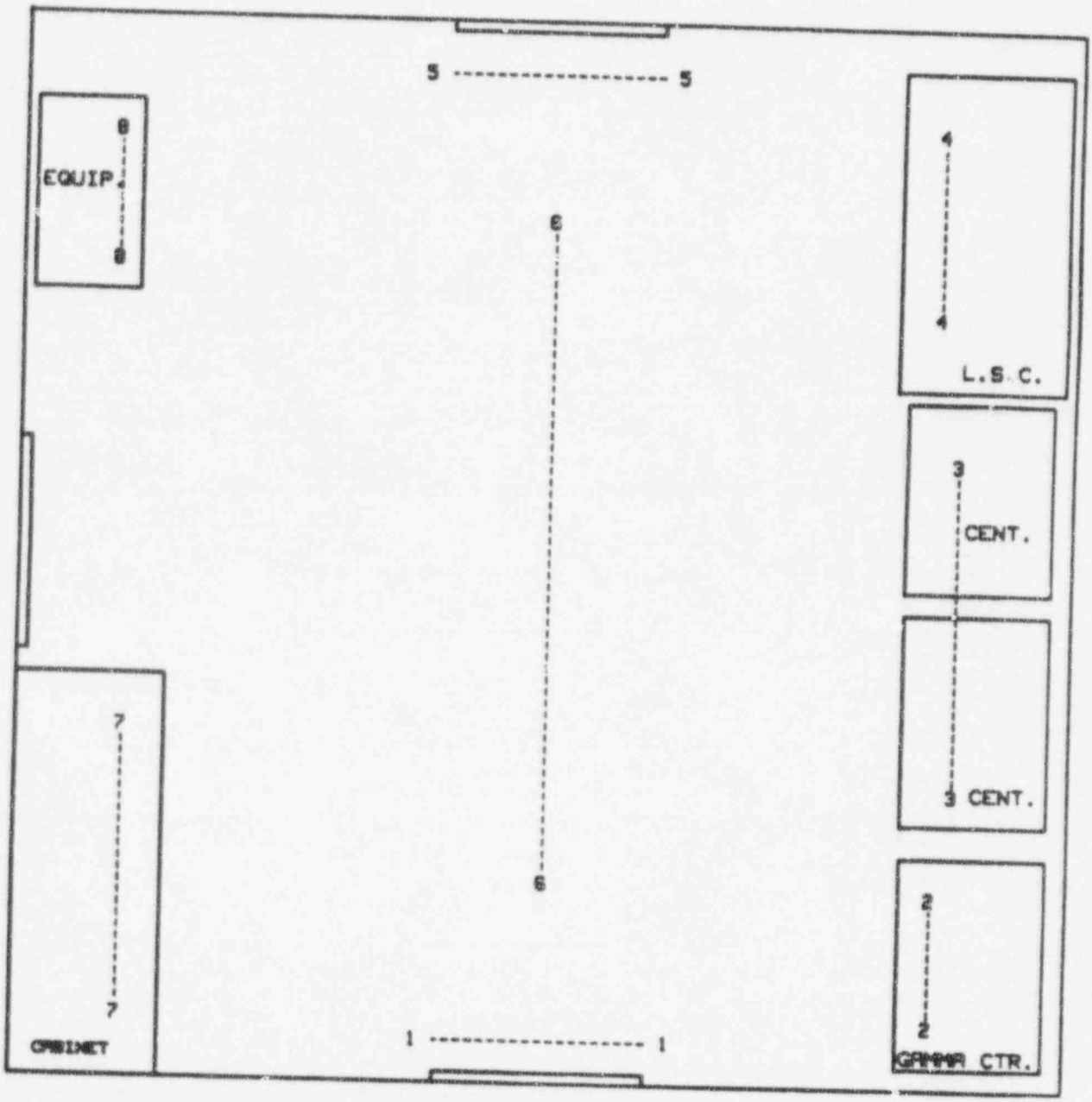
TELEDYNE ISOTOPES

DIAGRAM OF SURVEYED AREA

LOCATION: INSTRUMENT HALL

PRINCIPLE OCCUPANTS: OPEN ACCESS

ISOTOPE USAGE: H-3, C-14, I-125



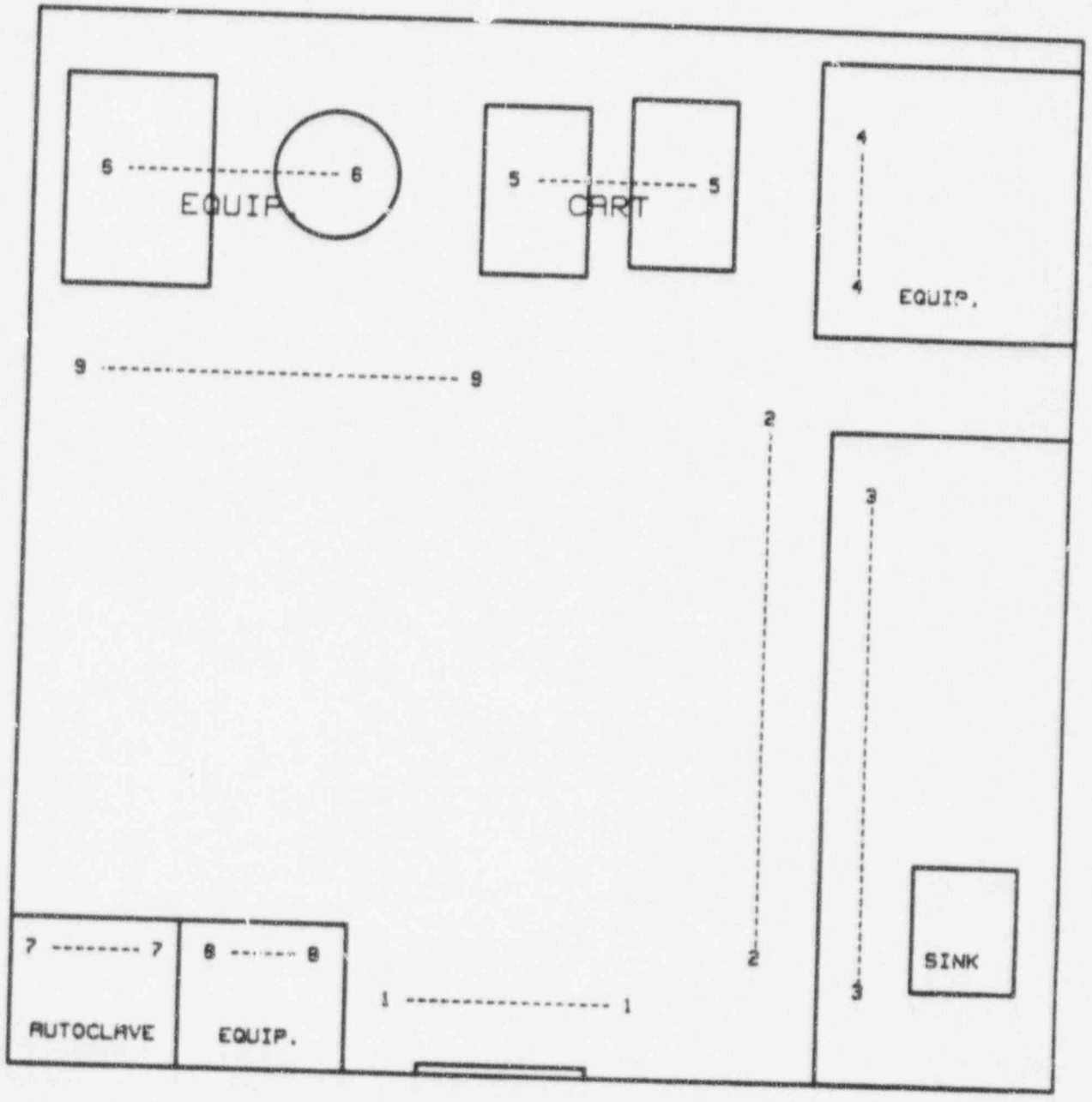
TELEDYNE ISOTOPES

DIAGRAM OF SURVEYED AREA

LOCATION: LAB PREP ROOM

PRINCIPLE OCCUPANTS: OPEN ACCESS

ISOTOPE USAGE: NONE



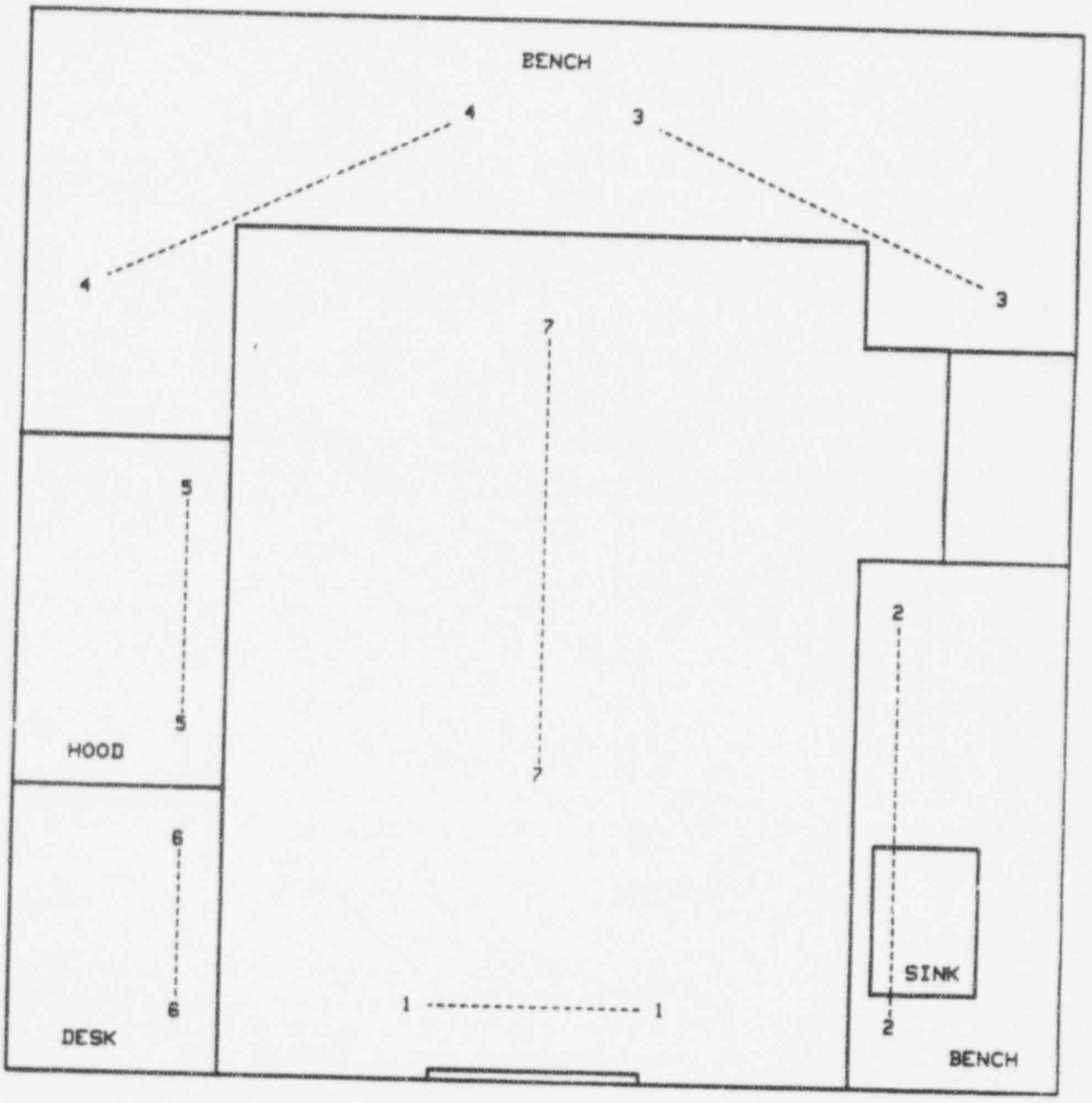
TELEDYNE ISOTOPES

DIAGRAM OF SURVEYED AREA

LOCATION: ORGANIC LAB

PRINCIPLE OCCUPANTS: OPEN ACCESS

ISOTOPE USAGE: H-3, C-14



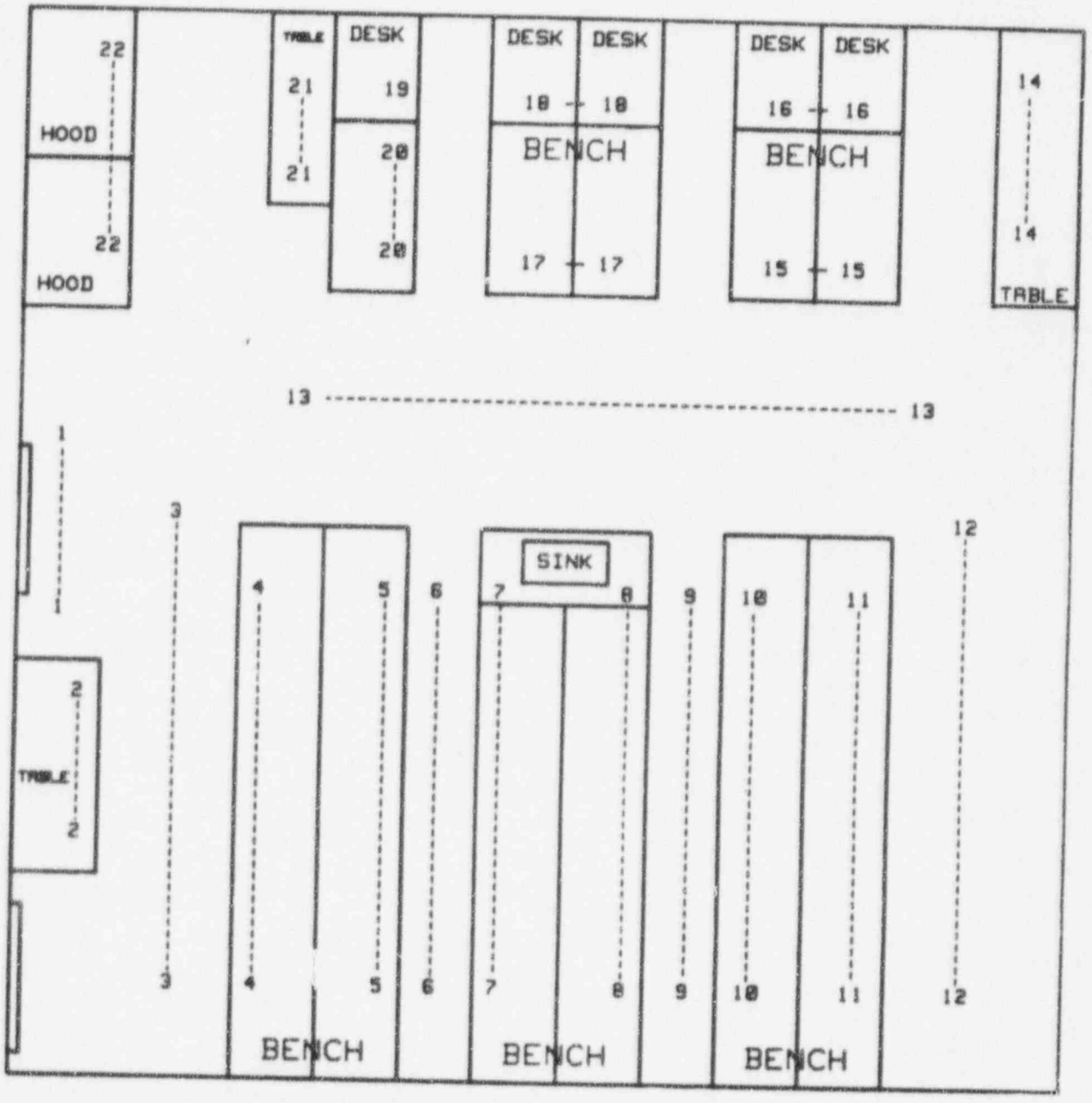
TELEDYNE ISOTOPES

DIAGRAM OF SURVEYED AREA

LOCATION: MAIN LABORATORY - C (WINDOW)

PRINCIPLE OCCUPANTS: OPEN ACCESS

ISOTOPE USAGE: H-3, C-14, Fe-59, I-125, Zn-65, S-35, Cr-51



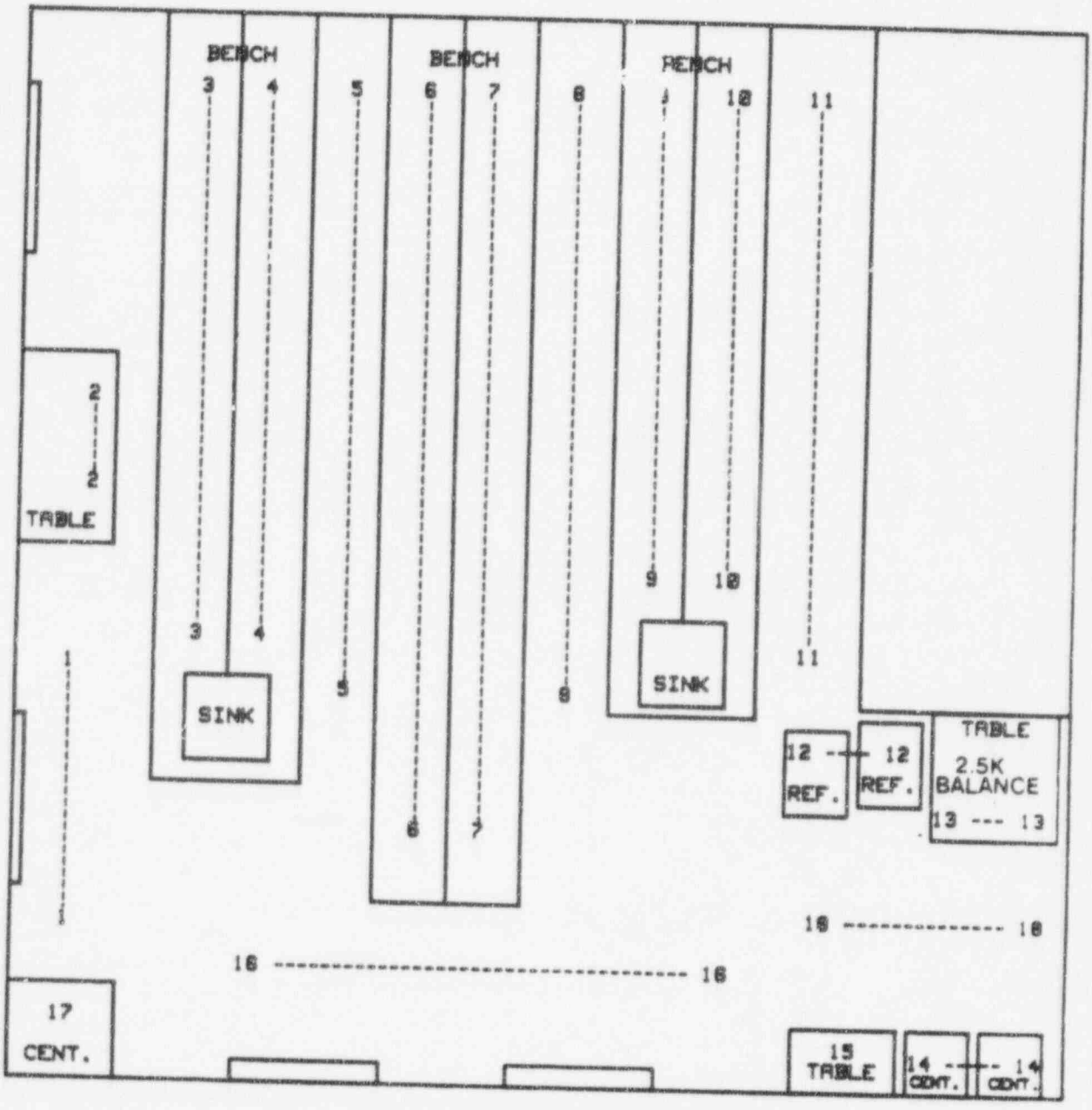
TELEDYNE ISOTOPES

DIAGRAM OF SURVEYED AREA

LOCATION: MAIN LABORATORY C (NO WINDOW)

PRINCIPLE OCCUPANTS: OPEN ACCESS

ISOTOPE USAGE: H-3, C-14, Fe-59, I-125, Zn-65, S-35, Cr-51



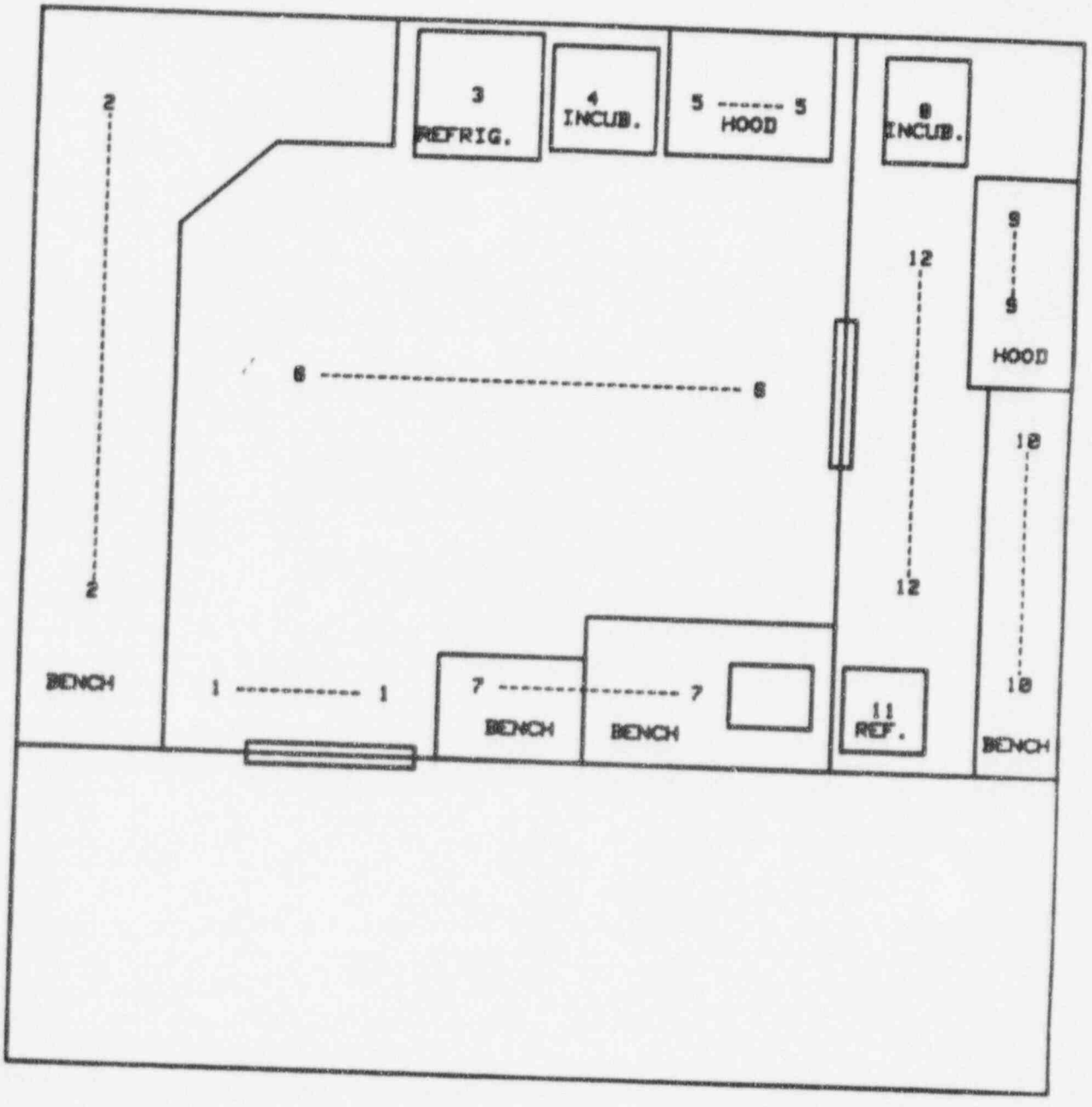
TELEDYNE ISOTOPES

DIAGRAM OF SURVEYED AREA

LOCATION: CELL CULTURE ROOM

PRINCIPLE OCCUPANTS: COLBY, S.
SAVAGE, K.

ISOTOPE USAGE:



TELEDYNE
ISOTOPES

MAY ~5 1991

The Liposome Company, Inc.
ATTN: Elizabeth Buccheri
Manager, Administrative
and Technical Service
1 Research Way
Princeton Forrestal Center
Princeton, NJ 08540

Gentlemen:

Enclosed is Check No.888 ($120) which accompanied your March 18, 1991, Decommissioning Funding Plan for Materials License 29-19918-01. As stated in Information Notice 90-38, Supplement 1, licensing actions are not required for financial assurance or decommissioning funding plan submittals. Accordingly, the amendment fee is not necessary.

Sincerely,

for

Glenda C. Jackson, Chief
Materials License Fee Section
License Fee & Debt Collection Branch
Division of Accounting and Finance
Office of the Controller

Enclosure:
Check No. 888 ($120)

DISTRIBUTION:
S/F Copy
LFDCB R/F (2)
DAF/OC R/F
GJackson, LFDCB
DW/MISC/Liposome

OFFICE	:OC/LFDCB	OC/LFDCB
SURNAME	:Skimberley:ab	GJackson
DATE	:5/2/91	5/3/91

(FOR LFMS USE)
INFORMATION FROM LTS

BETWEEN:

LICENSE FEE MANAGEMENT BRANCH, ARM
AND
REGIONAL LICENSING SECTIONS

PROGRAM CODE: 03620
STATUS CODE: 0
FEE CATEGORY: 3M
EXP. DATE: 19920430
FEE COMMENTS: _____

LICENSE FEE TRANSMITTAL

A. REGION

1. APPLICATION ATTACHED
APPLICANT/LICENSEE: LIPOSOME COMPANY INC. (THE)
RECEIVED DATE: 910417
DOCKET NO: 3019526
CONTROL NO.: 114548
LICENSE NO.: 29-19918-01
ACTION TYPE: AMENDMENT

2. FEE ATTACHED
AMOUNT: 12000
CHECK NO.: 888

3. COMMENTS

SIGNED _____
DATE 4/23/91

B. LICENSE FEE MANAGEMENT BRANCH (CHECK WHEN MILESTONE 03 IS ENTERED (✓))

1. FEE CATEGORY AND AMOUNT: 3M ~~FEE NOT REQUIRED~~

2. CORRECT FEE PAID. APPLICATION MAY BE PROCESSED FOR: per IN 90-38
AMENDMENT ✓
RENEWAL _____
LICENSE _____

3. OTHER _____
_____

SIGNED _____
DATE 5/22/91