

VOID SHEET

TO: License Fee Management Branch
FROM: Region IV
SUBJECT: VOIDED APPLICATION

Control Number: 461867
Applicant: Geo-Log, Inc.
Date Voided: 6/21/90

Reason for Void: Licensee requested
by letter dated June 19, 1990, that
their request for renewal be
voided & their license terminated.
Deficiency letter written June 8, 1989.

Bettie Muszynski 6/21/90
Signature Date

Attachment:
Official Record Copy of
Voided Action

FOR LFMB USE ONLY

Final Review of VOID Completed:

- Refund Authorized and processed
- No Refund Due
- Fee Exempt or Fee Not Required

Comments: _____

Log completed
Processed by: By Muszynski

9010220126 900621
REGA LIC30
MATLS LICENSING PDR

BETWEEN:

LICENSE FEE MANAGEMENT BRANCH, ARM
AND
REGIONAL LICENSING SECTIONS

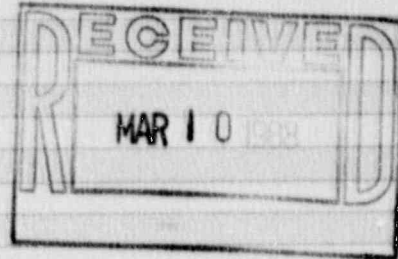
PROGRAM CODE: C3111
STATUS CODE: 2
FEE CATEGORY: 5A
EXP. DATE: 19880531
FEE COMMENTS:

LICENSE FEE TRANSMITTAL

A. REGION *IV*

1. APPLICATION ATTACHED

APPLICANT/LICENSEE: GEC-LOG, INC.
RECEIVED DATE: 880302
DOCKET NO: 3012963
CONTROL NO.: 481867
LICENSE NO.: 42-17558-01
ACTION TYPE: RENEWAL



2. FEE ATTACHED

AMOUNT: *\$700*
CHECK NO.: *2084*

3. COMMENTS

SIGNED *L. Guadalupe*
DATE *3/2/88*

B. LICENSE FEE MANAGEMENT BRANCH (CHECK WHEN MILESTONE 03 IS ENTERED *1/1*)

1. FEE CATEGORY AND AMOUNT: *5A (\$700)*

2. CORRECT FEE PAID. APPLICATION MAY BE PROCESSED FOR:

AMENDMENT _____
RENEWAL *✓* _____
LICENSE _____

3. OTHER _____

SIGNED *M. Guzman*
DATE *3/2/88*

NRC FORM 313
(7-87)
10 CFR 30, 32, 33, 34,
35 and 40

APPLICATION FOR MATERIAL LICENSE

U.S. NUCLEAR REGULATORY COMMISSION
MAR - 2 1988
3150 D120
Expires 6-30-88

INSTRUCTIONS: SEE THE APPROPRIATE LICENSE APPLICATION GUIDE FOR DETAILED INSTRUCTIONS FOR COMPLETING APPLICATION. SEND TWO COPIES OF THE ENTIRE COMPLETED APPLICATION TO THE NRC OFFICE SPECIFIED BELOW.

APPLICATIONS FOR DISTRIBUTION OF EXEMPT PRODUCTS FILE APPLICATIONS WITH:

U.S. NUCLEAR REGULATORY COMMISSION
DIVISION OF FUEL CYCLE AND MATERIAL SAFETY, NMSS
WASHINGTON, DC 20566

ALL OTHER PERSONS FILE APPLICATIONS AS FOLLOWS, IF YOU ARE LOCATED IN:

CONNECTICUT, DELAWARE, DISTRICT OF COLUMBIA, MAINE, MARYLAND, MASSACHUSETTS, NEW HAMPSHIRE, NEW JERSEY, NEW YORK, PENNSYLVANIA, RHODE ISLAND, OR VERMONT, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION I
NUCLEAR MATERIALS SAFETY SECTION B
631 PARK AVENUE
KING OF PRUSSIA, PA 19406

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

U.S. NUCLEAR REGULATORY COMMISSION, REGION II
NUCLEAR MATERIALS SAFETY SECTION
101 MARIETTA STREET, SUITE 2500
ATLANTA, GA 30323

IF YOU ARE LOCATED IN:

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

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

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

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

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

U.S. NUCLEAR REGULATORY COMMISSION, REGION V
NUCLEAR MATERIALS SAFETY SECTION
1450 MARIA LANE, SUITE 210
WALNUT CREEK, CA 94596

PERSONS LOCATED IN AGREEMENT STATES SEND APPLICATIONS TO THE U.S. NUCLEAR REGULATORY COMMISSION ONLY IF THEY WISH TO POSSESS AND USE LICENSED MATERIAL IN STATES SUBJECT TO U.S. NUCLEAR REGULATORY COMMISSION JURISDICTION.

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

- A. NEW LICENSE
- B. AMENDMENT TO LICENSE NUMBER _____
- C. RENEWAL OF LICENSE NUMBER 42-17558-01

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

GEO-LOG, INC.
205 Industrial Blvd.
Granbury, Texas 76048

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

205 Industrial Blvd; Granbury, Texas 76048 and at temporary job sites anywhere in the United States where the Nuclear Regulatory Commission maintains jurisdiction for regulating the use of licensed materials.

4. NAME OF PERSON TO BE CONTACTED ABOUT THIS APPLICATION

Floyd H. Moore, Jr.

TELEPHONE NUMBER

(817) 326-5321

SUBMIT ITEMS 6 THROUGH 11 ON 8 1/2 x 11" PAPER. THE TYPE AND SCOPE OF INFORMATION TO BE PROVIDED IS DESCRIBED IN THE LICENSE APPLICATION GUIDE.

5. RADIOACTIVE MATERIAL

a. Element and mass number, b. chemical and/or physical form, and c. maximum amount which will be possessed at any one time.

6. PURPOSE(S) FOR WHICH LICENSED MATERIAL WILL BE USED

7. INDIVIDUAL(S) RESPONSIBLE FOR RADIATION SAFETY PROGRAM AND THEIR TRAINING AND EXPERIENCE

8. TRAINING FOR INDIVIDUALS WORKING IN OR FREQUENTING RESTRICTED AREAS

9. FACILITIES AND EQUIPMENT

10. RADIATION SAFETY PROGRAM

11. WASTE MANAGEMENT

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

FEE CATEGORY Well logging-A AMOUNT ENCLOSED \$700.00

13. CERTIFICATION (Must be completed by applicant) THE APPLICANT UNDERSTANDS THAT ALL STATEMENTS AND REPRESENTATIONS MADE IN THIS APPLICATION ARE BINDING UPON THE APPLICANT.

THE APPLICANT AND ANY OFFICIAL EXECUTING THIS CERTIFICATION ON BEHALF OF THE APPLICANT, NAMED IN ITEM 2 CERTIFY THAT THIS APPLICATION IS PREPARED IN CONFORMITY WITH TITLE 10, CODE OF FEDERAL REGULATIONS, PARTS 30, 32, 33, 34, 35, AND 40 AND THAT ALL INFORMATION CONTAINED HEREIN, IS TRUE AND CORRECT TO THE BEST OF THEIR KNOWLEDGE AND BELIEF.

WARNING: 18 U.S.C. SECTION 1001 ACT OF JUNE 25, 1948, 62 STAT. 749 MAKES IT A CRIMINAL OFFENSE TO MAKE A WILLFULLY FALSE STATEMENT OR REPRESENTATION TO ANY DEPARTMENT OR AGENCY OF THE UNITED STATES AS TO ANY MATTER WITHIN ITS JURISDICTION.

SIGNATURE-CERTIFYING OFFICER

Floyd H. Moore, Jr.

TYPED/PRINTED NAME

Floyd H. Moore, Jr.

TITLE

Vice President/ R.S.O.

DATE

19 Feb 88

FOR NRC USE ONLY

TYPE OF FEE FEE LOG FEE CATEGORY COMMENTS

Ren

Mar-1-IV

5A

AMOUNT RECEIVED

\$700

CHECK NUMBER

2054

APPROVED BY

M. J. ...

DATE

3/7/88

461867



GEO-LOG, INC.

205 INDUSTRIAL BLVD.
GRANBURY, TEXAS 76048
817-326-5321

NUCLEAR REGULATORY LICENSE RENEWAL 42-17558-01

ITEM 5

A.	B.	C.
(1) Americium-241	Sealed Source (NSSI Model AN-HP)	No single source to exceed 20 Curies
(2) Americium-241	Sealed Source (GNI model 71-1)	No single source to exceed 5 Curies
(3) Cobalt-60	Sealed Source (GNI model VL-1)	No single source to exceed 4 Millicuries
(4) Cesium-137	Sealed Source (GNI model VL-1)	No single source to exceed 125 Millicuries
(5) Cesium-137	Sealed Source (GNI model VL-1 or CSV)	No single source to exceed 2 Curies
(6) Iridium-192	Sealed Source (GNI model VL-1)	No single source to exceed 150 Millicuries
(7) Iodine-131	Any	200 Millicuries total (Not to exceed 40 Millicuries per unit received)
(8) Iridium-192	Any	200 Millicuries total (Not to exceed 40 Millicurie per unit received)

ITEM 6

Sources 1 thru 5	'For use in Hazardous/toxic waste site investigation, and mineral, oil, and gas well logging.'
Source 6	'For use in Hazardous/toxic waste site investigation, and mineral, oil, and gas well logging in uncased wells through potable water.'
Sources 7 and 8	'For use in Tracer Studies in oil and gas wells.'



GEO-LOG, INC.

205 INDUSTRIAL BLVD.
GRANBURY, TEXAS 76048
817-326-5321

NUCLEAR REGULATORY LICENSE RENEWAL

42-17558-01

ITEM 7

'Licensed material shall be used by, or under the supervision and in the physical presence of, individuals designated by the Radiation Protection Officer - Floyd H. Moore, Jr.' *Reference current license item 12*

ITEM 8

'Floyd H. Moore, Jr., Vice President and R.S.O. of Geo-Log, Inc. will be present any time any individual is in a restricted area. The only restricted area at Geo-Log is the source storage facility. All individuals who use radioactive materials have been through an approved Radiation Safety Course as well as having been instructed in Geo-Log's Safety Procedures.'

ITEM 9

Source Storage Facilities - Our sources when not in use will be stored in the storage facility located at the rear of our company premises at 205 Industrial Blvd.; Granbury, Texas 76048. We have constructed an area away from our shop facility for the storage of the sources. The sources are kept in locked steel tubes buried in the ground and set in concrete inside a locked steel building. Tube length is slightly over 4 feet and the sources are in the bottom 2 feet of each tube. The gamma emitting sources have lead filled steel caps, the neutron emitting sources have wax filled steel caps. The neutron storage tubes are steel interior tube with an exterior tube of schedule 80 PVC filled with wax. All caps lock to the floor.

When the sources are in use they are stored in approved source storage containers bolted to the frame of the logging vehicle. *reference letter dated November 11, 1982 "Description of Storage Facility"***

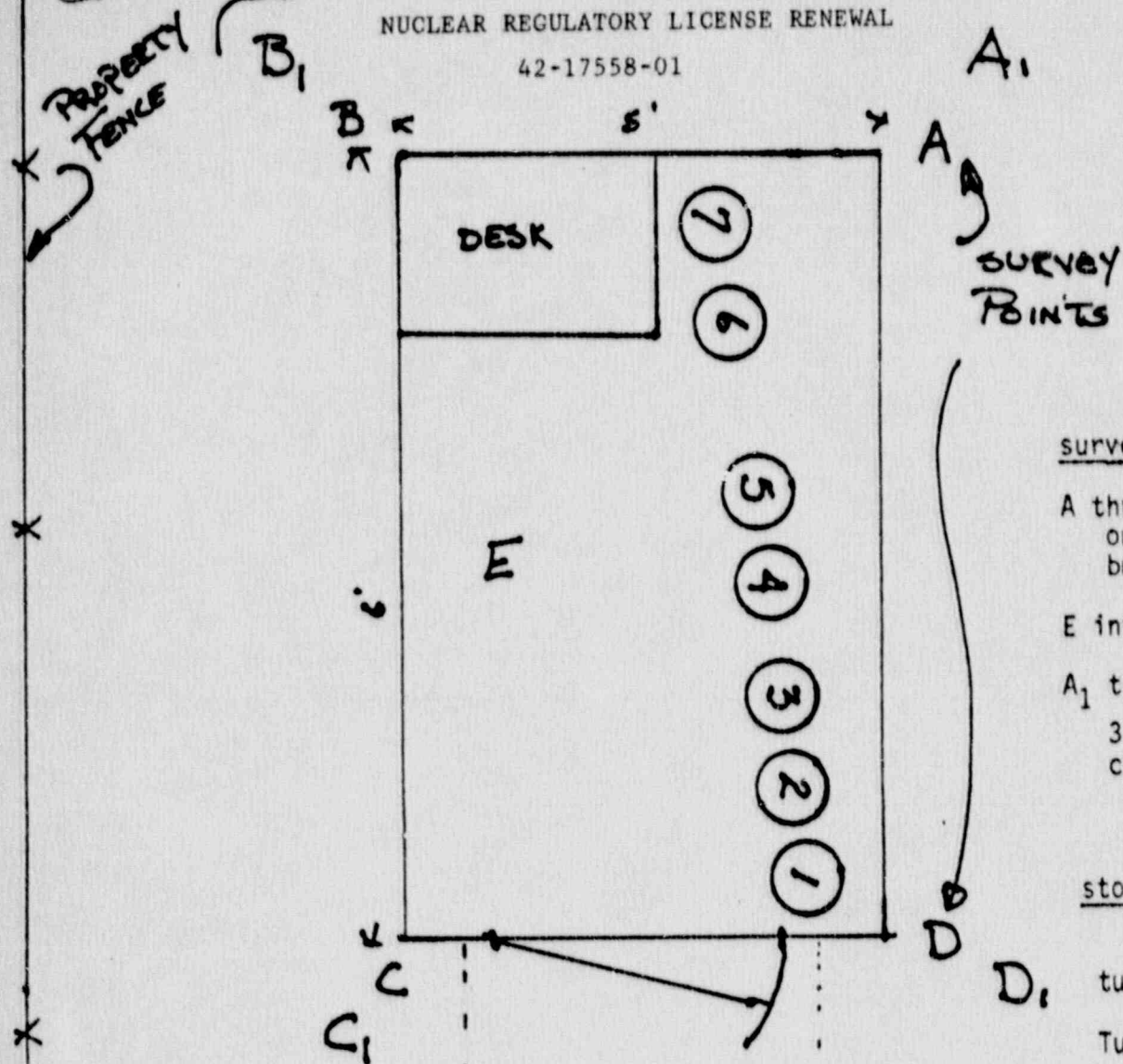


SOURCE STORAGE FACILITY

GEO-LOG, INC.

205 INDUSTRIAL BLVD.
GRANBURY, TEXAS 76048
817-326-5321

NUCLEAR REGULATORY LICENSE RENEWAL
42-17558-01



survey points

- A thru D
outside corner of building
- E interior of building
- A₁ thru D₁
3 feet from outside corner of building

storage identification

- sealed Gamma
tube 1
Cobalt 60
- Tube 2
Cesium 137/Iridium 192
tube 3
spare 11/86
- sealed Neutron
tube 4
Am 241 Be
- tube 5
spare - 11/86
- tracer sources
tube 6
spare 11/86
- tube 7
spare 11/86

NOTES: Tubes 1,2,3,6, & 7 have lead filled top caps.
Tubes 4 & 5 have waxed filled caps and are surrounded with 2 inches of wax top to bottom held in place with 8" id PVC pipe.

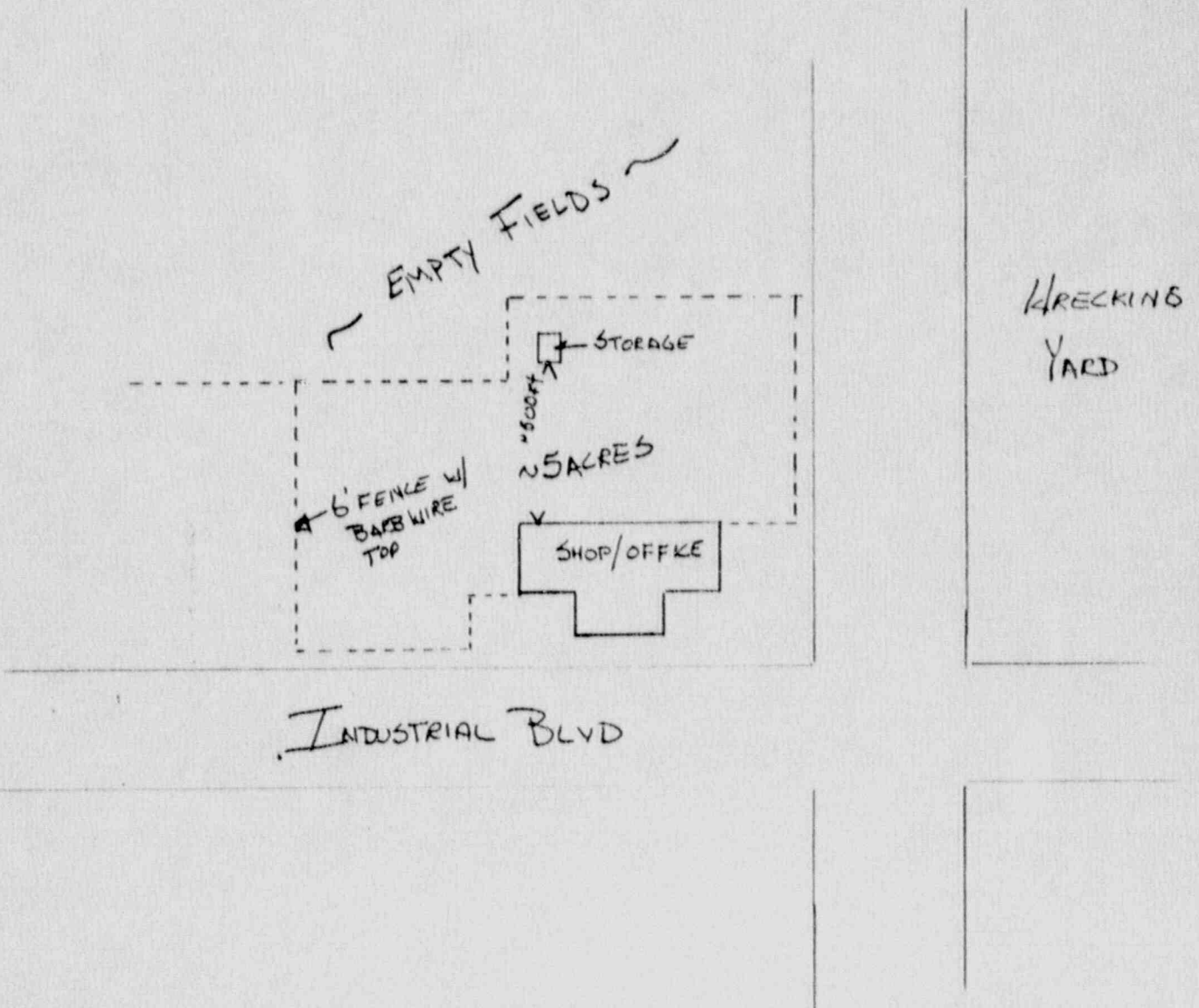


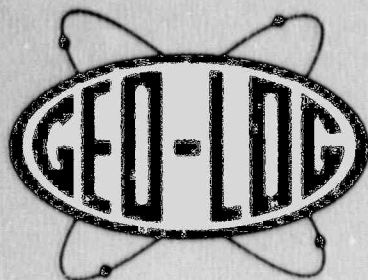
GEO-LOG, INC.

205 INDUSTRIAL BLVD.
GRANBURY, TEXAS 76048
817-326-5321

NUCLEAR REGULATORY LICENSE RENEWAL
42-17558-01

ITEM 9 source storage facilities





GEO-LOG, INC.

205 INDUSTRIAL BLVD.
GRANBURY, TEXAS 76048
817-326-5321

NUCLEAR REGULATORY LICENSE RENEWAL

42-17558-01

ITEM 10

Radiation Safety Program - Radiation Safety instructions will be provided by the Radiation Safety Officer to all employees involved with radioactive materials. Only approved handling tools are used when working with radioactive materials. Each individual working with radioactive materials will be supplied with a beta, gamma, neutron film badge and they will be instructed to wear their badge whenever working with radioactive sources. Geo-Log, Inc. uses a film badge service from Nuclear Sources and Services, Inc. in Houston, Texas - (a copy of their accreditation certificate is enclosed).
Reference also Geo-Log's "RADIATION SAFETY PROCEDURES" handbook

Leak Testing Procedures - ***Reference current license item 13***

Survey Procedures - ***Reference letter dated November 11, 1982*** plus

'Each survey sheet will contain information to uniquely identify the instrument used in making the survey -
MODEL SERIAL NUMBER CALIBRATION DATE as well as
OPERATOR NAME DATE of SURVEY SOURCE SERIAL NUMBER(s)'

Reference also items 14, 15, 16 and 17 of current license - to be included as part of the Radiation Safety Program.

Survey Meter Calibration - ***Reference Letter dated November 11, 1982*** with the following changes - Marshall B. Broome is no longer with Geo-Log, Inc. and as such will no longer calibrate survey meters. Also meters may be sent to Gulf Nuclear, Inc. in Houston, Texas for calibration.

Radiation Safety Procedures - Floyd H. Moore, Jr. Vice President of Geo-Log, Inc. will both manage the Radiation Program and serve as Radiation Safety Officer (***ref current license item 12***). He will have the overall responsibility for the safe handling of the radioisotopes used by Geo-Log, Inc. His responsibilities will include:

- a. On the job training of personnel in the safe handling of radioisotopes
- b. Approval of equipment and techniques for the storage, use, and disposal of radioisotopes.
- c. Supply the personnel with TLD badges as required.
- d. Maintain radiation exposure records.
- e. Making sure that Geo-Log, Inc. complies with the applicable regulations of the Nuclear Regulatory Commission, and all states in which Geo-Log, Inc. performs well logging services.

United States Department of Commerce
National Bureau of Standards

NVLAQ

Certificate of Accreditation

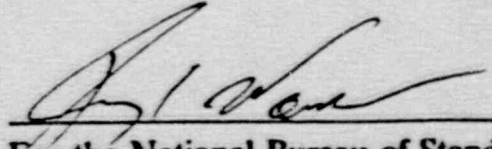
NUCLEAR SOURCES & SERVICES, INC.
Houston, TX

is recognized under the National Voluntary Laboratory Accreditation Program
for satisfactory compliance with criteria established in Title 15, Part 7 Code of Federal Regulations for:

providing specific Personnel Radiation Dosimetry Processing Services



Effective until January 1, 1990


For the National Bureau of Standards

ITEM 10 radiation safety program



GEO-LOG, INC.

205 INDUSTRIAL BLVD.
GRANBURY, TEXAS 76048
817-326-5321

NUCLEAR REGULATORY LICENSE RENEWAL

42-17558-01

ITEM 11

We will generate no radioactive waste. Any sealed sources will be returned to the source supplier when no longer needed or found to be leaking. Disposal records will be kept on file in the office. Tracer material containers will be stored in a locked container located in the source storage building, until they can be either returned to the supplier or until they reach normal background at which time they will be disposed of - and not reused.

MATERIALS LICENSE

Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974 (Public Law 93-438), and Title 10, Code of Federal Regulations, Chapter I, Parts 30, 31, 32, 33, 34, 35, 40 and 70, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess, and transfer byproduct, source, and special nuclear material designated below; to use such material for the purpose(s) and at the place(s) designated below; to deliver or transfer such material to persons authorized to receive it in accordance with the regulations of the applicable Part(s). This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, as amended, and is subject to all applicable rules, regulations and orders of the Nuclear Regulatory Commission now or hereafter in effect and to any conditions specified below.

Licensee

- 1. Geo-Log, Inc.
- 2. 103 Industrial Boulevard
Granbury, Texas 76048

In accordance with letter dated
September 5, 1985

3. License number 42-17558-01 is amended in
its entirety to read as follows:

4. Expiration date May 31, 1988

5. Docket or
Reference No. 030-12963

6. Byproduct, source and/or special nuclear material	7. Chemical and/or physical form	8. Maximum amount that licensee may possess at any one time under this license
A. Americium-241	A. Sealed source (NSSI Model AN-HP)	A. Not to exceed 20 curies per source
B. Americium-241	B. Sealed source (Gulf Nuclear Model NEEI-AmBe-71-1)	B. Not to exceed 4.6 curies per source
C. Cobalt-60	C. Sealed source (Gulf Nuclear Model VL-1 or Gamma Industries Model VD(HP))	C. Not to exceed 4 millicuries per source
D. Cesium-137	D. Sealed source (Gulf Nuclear Model VL-1 or Gamma Industries Model VD(HP))	D. Not to exceed 125 millicuries per source
E. Iridium-192	E. Sealed source (Gulf Nuclear Model VL-1)	E. Not to exceed 150 millicuries per source
F. Cesium-137	F. Sealed source (Gulf Nuclear Model CSV)	F. Not to exceed 1 curie per source

**MATERIALS LICENSE
SUPPLEMENTARY SHEET**

License number
42-17558-01

Docket or Reference number
030-12963

Amendment No. 05

9. Authorized use

- A. through D. For use in hazardous/toxic waste site investigation, and mineral, oil, and gas well logging.
- E. For use in hazardous/toxic waste site investigation, and mineral, oil, and gas well logging in uncased wells through potable water zones.
- F. For use in a Gulf Nuclear Calibrator Model IC-51.

CONDITIONS

- 10. Licensed material shall be used only at temporary job sites of the licensee anywhere in the United States where the Nuclear Regulatory Commission maintains jurisdiction for regulating the use of licensed material.
- 11. The licensee shall comply with the provisions of Title 10, Chapter 1, Code of Federal Regulations, Part 19, "Notices, Instructions and Reports to Workers; Inspections" and Part 20, "Standards for Protection Against Radiation."
- 12. Licensed material shall be used by, or under the supervision and in the physical presence of, individuals designated by the Floyd H. Moore, Jr., Radiation Protection Officer.
- 13. A. (1) Each sealed source containing licensed material, other than hydrogen-3, with a half-life greater than 30 days and in any form other than gas shall be tested for leakage and/or contamination at intervals not to exceed 6 months. In the absence of a certificate from a transferor indicating that a test has been made within 6 months prior to the transfer, a sealed source received from another person shall not be put into use until tested.
(2) The periodic leak test required by this condition does not apply to sealed sources that are stored and not being used. The sources excepted from this test shall be tested for leakage prior to any use or transfer to another person unless they have been leak tested within 6 months prior to the date of use or transfer.

**MATERIALS LICENSE
SUPPLEMENTARY SHEET**

License number
42-17558-01

Docket or Reference number
030-12963

Amendment No. 05

13. (continued)

- B. The test shall be capable of detecting the presence of 0.005 microcurie of radioactive material on the test sample. The test sample shall be taken from the sealed source or from the surfaces of the device in which the sealed source is permanently mounted or stored on which one might expect contamination to accumulate. Records of leak test results shall be kept in units of microcuries and maintained for inspection by the Commission.
- C. If the test reveals the presence of 0.005 microcurie or more of removable contamination, the licensee shall immediately withdraw the sealed source from use and shall cause it to be decontaminated and repaired or to be disposed of in accordance with Commission regulations. A report shall be filed within 5 days of the test with the U. S. Nuclear Regulatory Commission, Region IV, 611 Ryan Plaza Dr., Suite 1000, Arlington, Texas 76011, describing the equipment involved, the test results, and the corrective action taken.
- D. The licensee is authorized to collect leak test samples in accordance with the procedures described in the licensee's application dated October 31, 1982, for analysis by Gulf Nuclear, Inc. Alternatively, leak test samples may be collected and/or analyzed by other persons specifically authorized by the Commission or an Agreement State to perform such services.

14. Sealed sources containing licensed material shall not be opened.

15. The licensee shall report by telephone within 24 hours to the nearest U. S. Nuclear Regulatory Commission regional office the loss or potential abandonment down-hole of any sealed source containing licensed material. In addition, a written report shall be submitted within 30 days for the lost or abandoned source which shall include information regarding isotope, amount, location, depth, method of immobilization, sealing, placarding, and notations to be placed in public records.

16. The licensee shall conduct a physical inventory every 6 months to account for all sealed sources received and possessed under the license. The records of the inventories shall be maintained for 2 years from the date of the inventory for inspection by the Commission, and shall include the quantities and kinds of byproduct material, manufacturer's name and model numbers, location of sealed sources and the date of the inventory.

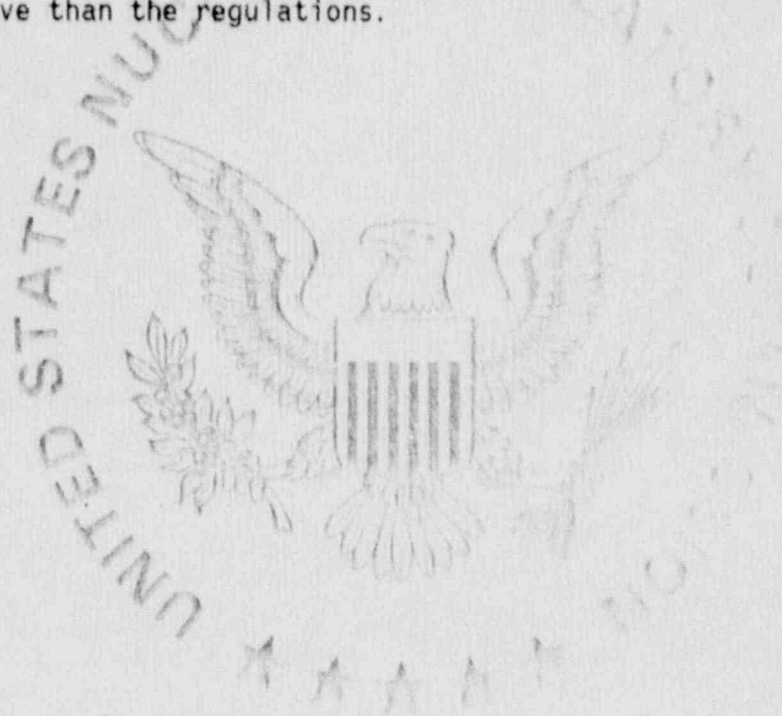
**MATERIALS LICENSE
SUPPLEMENTARY SHEET**

License number
42-17558-01

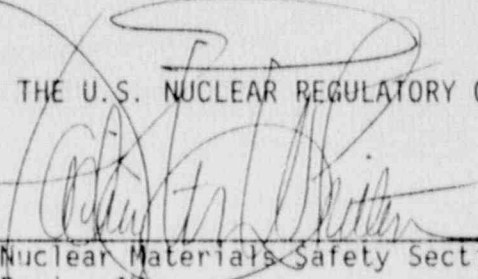
Docket or Reference number
030-12963

Amendment No. 05

17. The licensee may transport licensed material or deliver licensed material to a carrier for transport in accordance with the provisions of Title 10, Code of Federal Regulations, Part 71, "Packaging and Transportation of Radioactive Material."
18. Except as specifically provided otherwise by this license, the licensee shall possess and use licensed material described in Items 6, 7, and 8 of this license in accordance with statements, representations, and procedures contained in dated October 31, 1982; and letters dated April 20, 1983, April 23, 1984, and September 5, 1985. The Nuclear Regulatory Commission's regulations shall govern the licensee's statements in applications or letters, unless the statements are more restrictive than the regulations.



FOR THE U.S. NUCLEAR REGULATORY COMMISSION

By 
Nuclear Materials Safety Section
Region IV
Arlington, Texas 76011

Date DEC 20 1985

**MATERIALS LICENSE
SUPPLEMENTARY SHEET**

License number
42-17558-01

Docket or Reference number
030-12963

Amendment No. 06

Geo-Log, Inc.
205 Industrial Boulevard
Granbury, Texas 76048

In accordance with letter dated November 12, 1986, License Number 42-17558-01 is amended as follows:

The address of the licensee is changed from 103 Industrial Boulevard, Granbury, Texas 76048, to 205 Industrial Boulevard, Granbury, Texas 76048.

Condition 18. is amended to read:

18. Except as specifically provided otherwise in this license, the licensee shall conduct its program in accordance with the statements, representations, and procedures contained in the documents, including any enclosures, listed below. The Nuclear Regulatory Commission's regulations shall govern unless the statements, representations, and procedures in the licensee's application and correspondence are more restrictive than the regulations.

- A. Application dated October 31, 1982
- B. Letter dated April 20, 1983
- C. Letter dated April 23, 1984
- D. Letter dated September 5, 1985
- E. Letter dated November 12, 1986

FOR THE U.S. NUCLEAR REGULATORY COMMISSION

By
Nuclear Materials Safety Section
Region IV
Arlington, Texas 76011

Date DEC 18 1986

MAILED: OVERNIGHT EXPRESS
11-16-82



GEO-LOG, INC.

CORPORATE OFFICE
193 INDUSTRIAL BLVD.
MCKINNEY, TEXAS 75069
(214) 542-9333

ALSO ENCLOSED / COPY of NRC Lic.
" " TEX "

November 11, 1982

Nuclear Regulatory Commission
Radioisotopes Licensing Branch
Division of Fuel Cycle and Material Safety
Washington, D. C. 20555

Attention: J. M. Brown, Jr.

Reference: Renewal of NRC License No. 42-17558-01
Expiration date - November 30, 1982

Dear Sir:

Enclosed is our Application for Renewal of the above referenced license to perform well logging services in the United States using radioactive materials.

Along with the application is a Supplemental Sheet listing the various items requested in the application. Since you are holding the original application and copies of the applicable drawings referred to in the application, we are not sending additional copies at this time. If you require a resubmission of them, please let us know and we will get them to you as soon as possible.

Please note that the Item No. 8 quantities of radioactive materials to be included on the license has been increased over the original application. We would appreciate your consideration in this matter. We have authority to use up to these quantities using our Texas License No. 5-1944 in the Agreement States and wish our NRC License to be amended to include these amounts also.

If any additional information is needed, please do not hesitate to let us know immediately.

Yours very truly,

Marshall B. Broome

Marshall B. Broome
President

MBB:mc
Encl.

NRC Form 313 I
(12-61)
10 CFR 20

U.S. NUCLEAR REGULATORY COMMISSION

APPLICATION FOR BYPRODUCT MATERIAL LICENSE
INDUSTRIAL

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

a. NEW LICENSE

b. AMENDMENT TO:
LICENSE NUMBER

c. RENEWAL OF:
LICENSE NUMBER

X 42-17558-01

See attached instructions for details.

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

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

GEO-LOG, INC.

TELEPHONE NUMBER: AREA CODE - NUMBER EXTENSION
214-542-9333

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

Marshall B. Broome, President

TELEPHONE NUMBER: AREA CODE - NUMBER EXTENSION
214-542-9333

4. APPLICANT'S MAILING ADDRESS (Include Zip Code)
(Address to which NRC correspondence, notices, bulletins, etc., should be sent.)

193 Industrial Blvd.
McKinney, Texas 75069

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

Sealed Sources are
Stored at 193 Industrial Blvd., McKinney,
Texas when not in use in logging vehicles
located nationwide

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

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

FULL NAME

TITLE

a. Marshall Benjamin Broome

President

b. License should read: Radioactive material shall be used by, or under the supervision of, individuals designated by Marshall B. Broome. These individuals shall have completed the licensee's training program and a minimum of two weeks

c. on the job training with radioactive materials as outlined in Items 16 and 17 and describe his responsibilities under Item 15.
Marshall Benjamin Broome
Copy enclosed.

8. LICENSED MATERIAL

LINE NO.	ELEMENT AND MASS NUMBER	CHEMICAL AND/OR PHYSICAL FORM	NAME OF MANUFACTURER AND MODEL NUMBER (If Sealed Source)	MAXIMUM NUMBER OF MILLICURIES AND/OR SEALED SOURCES AND MAXIMUM ACTIVITY PER SOURCE WHICH WILL BE POSSESSED AT ANY ONE TIME	DESCRIBE USE OF LICENSED MATERIAL
1. <input checked="" type="checkbox"/>	241 AmBe	Sealed Source	NSSI Model #AN-HP or Gulf Nuclear, #71-1	20 sources of 1 Curie each	
2. <input checked="" type="checkbox"/>	60 Co	Sealed Source	GNI #VL-1, GI #VD(HP)	20 sources of 4 mCi each	
3. <input checked="" type="checkbox"/>	137 Cs	Sealed Source	GNI #VL-1, GI #VD(HP)	20 sources of up to 125 mCi each	
4. <input checked="" type="checkbox"/>	137 Cs	Sealed Source	GNI #CSV	1 source of 1 Curie for Survey Mtr. Calib.	
5. <input checked="" type="checkbox"/>	226 Ra	Sealed Source	GNI Test Source	No single source to exceed 25 μ Ci, total not to exceed 1 mCi	
6. <input checked="" type="checkbox"/>	192 Ir	Sealed Source	GNI #VL-1	5 sources of 100 mCi ea.	
(1)	Lines 1 thru 3 above - Mineral, Oil and Gas Well Logging				
(2)	Line 4 - Survey Meter Calibration using Gulf Nuclear Calibrator IC-51				
(3)	Line 5 - Logging tool calibration source				
	Line 6 - Mineral, Oil and Gas Well Logging				

9. STORAGE OF SEALED SOURCES

LINE NO.	CONTAINER AND/OR DEVICE IN WHICH EACH SEALED SOURCE WILL BE STORED OR USED.	NAME OF MANUFACTURER	MODEL NUMBER
	A.	B.	C.
(1)	Approved, double welded stainless steel capsules	Gulf Nuclear, Inc.	VL-1
(2)	2" thick lead container with safety lock for storage when not in use	REMCO	
(3)	Special approved shields such as for Neutron source	REMCO	
(4)	Source Handling Tools	REMCO	HT-1, HT-2

10. RADIATION DETECTION INSTRUMENTS

LINE NO.	TYPE OF INSTRUMENT	MANUFACTURER'S NAME	MODEL NUMBER	NUMBER AVAILABLE	RADIATION DETECTED (alpha, beta, gamma, neutron)	SENSITIVITY RANGE (milliroentgens/hour or counts/minute)
	A	B	C	D	E	F
(1)	Survey Meter	PRI Victoreen	111B) 493)	1 ea. vehicle	Gamma	
(2)						
(3)						
(4)						

11. CALIBRATION OF INSTRUMENTS LISTED IN ITEM 10

<input type="checkbox"/> a. CALIBRATED BY SERVICE COMPANY NAME, ADDRESS, AND FREQUENCY	<input checked="" type="checkbox"/> b. CALIBRATED BY APPLICANT Attach a separate sheet describing method, frequency and standards used for calibrating instruments. See Supplemental Sheet
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12. PERSONNEL MONITORING DEVICES

TYPE (Check and/or complete as appropriate.) A	SUPPLIER (Service Company) B	EXCHANGE FREQUENCY C
<input checked="" type="checkbox"/> (1) FILM BADGE <input type="checkbox"/> (2) THERMOLUMINESCENCE DOSIMETER (TLD) <input type="checkbox"/> (3) OTHER (Specify): _____ _____ _____	Nuclear Sources & Service, Inc. P. O. Box 34042 Houston, Tx. 77034	<input type="checkbox"/> MONTHLY <input checked="" type="checkbox"/> QUARTERLY <input type="checkbox"/> OTHER (Specify): _____ _____

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

- a. LABORATORY FACILITIES, PLANT FACILITIES, FUME HOODS (Include filtration, if any), ETC.
 - b. STORAGE FACILITIES, CONTAINERS, SPECIAL SHIELDING (fixed and/or temporary), ETC.
 - c. REMOTE HANDLING TOOLS OR EQUIPMENT, ETC.
 - d. RESPIRATORY PROTECTIVE EQUIPMENT, ETC.
- SEALED SOURCES

14. WASTE DISPOSAL

a. NAME OF COMMERCIAL WASTE DISPOSAL SERVICE EMPLOYED
 NONE

b. IF COMMERCIAL WASTE DISPOSAL SERVICE IS NOT EMPLOYED, SUBMIT A DETAILED DESCRIPTION OF METHODS WHICH WILL BE USED FOR DISPOSING OF RADIOACTIVE WASTES AND ESTIMATES OF THE TYPE AND AMOUNT OF ACTIVITY INVOLVED. IF THE APPLICATION IS FOR SEALED SOURCES AND DEVICES AND THEY WILL BE RETURNED TO THE MANUFACTURER, SO STATE.

Sealed Sources - will be returned to manufacturer for disposal.

INFORMATION REQUIRED FOR ITEMS 15, 16 AND 17

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

15. **RADIATION PROTECTION PROGRAM.** Describe the radiation protection program as appropriate for the material to be used including the duties and responsibilities of the Radiation Protection Officer, control measures, bioassay procedures (if needed), day-to-day general safety instruction to be followed, etc. If the application is for sealed source's also submit leak testing procedures, or if leak testing will be performed using a leak test kit, specify manufacturer and model number of the leak test kit.

16. **FORMAL TRAINING IN RADIATION SAFETY.** Attach a resume for each individual named in Items 6 and 7. Describe individual's formal training in the following areas where applicable. Include the name of person or institution providing the training, duration of training, when training was received, etc.
 - a. Principles and practices of radiation protection.
 - b. Radioactivity measurement standardization and monitoring techniques and instruments.
 - c. Mathematics and calculations basic to the use and measurement of radioactivity.
 - d. Biological effects of radiation.

17. **EXPERIENCE.** Attach a resume for each individual named in Items 6 and 7. Describe individual's work experience with radiation, including where experience was obtained. Work experience or on-the-job training should be commensurate with the proposed use. Include list of radioisotopes and maximum activity of each used.

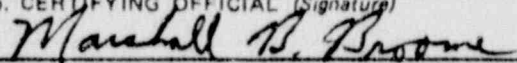
18. CERTIFICATE

(This item must be completed by applicant)

See Supplemental Sheet for additional information.

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

WARNING.—18 U.S.C., Section 1001; Act of June 25, 1948; 62 Stat. 749; makes it a criminal offense to make a willfully false statement or representation to any department or agency of the United States as to any matter within its jurisdiction.

a. LICENSE FEE REQUIRED (See Section 170.31, 10 CFR 170) \$460.00	b. CERTIFYING OFFICIAL (Signature) 
	c. NAME (Type or print) Marshall B. Broome
(1) LICENSE FEE CATEGORY: Well Logging	d. TITLE President
(2) LICENSE FEE ENCLOSED: \$ 460.00	e. DATE 10/31/82



GEO-LOG, INC.

CORPORATE OFFICE
193 INDUSTRIAL BLVD.
MCKINNEY, TEXAS 75069
(214) 542-9333

SUPPLEMENTAL SHEET

APPLICATION FOR NRC LICENSE

RENEWAL

LICENSE #42-17558-01

DESCRIPTION OF STORAGE FACILITIES - Our sources, when not in use, will be stored in the storage facility on our company premises, 193 Industrial Blvd., McKinney, Texas. We have built a special room at the back of our building that can be entered only through a locked door inside the facility. The storage bunkers were built following the safety procedures set forth by both the NRC and the State of Texas, whose License No. 5-1944 we hold. The $^{241}\text{AmBe}$ neutron sources are housed in the REMCO Source Holder (See drawing) and carried in the REMCO S-2 Source Shield (See drawing) to and from the job site. The CS137 source housing can be seen on SIE Drawing 4027 and the Co60 source housing is shown on SIE Drawing 4028. Drawing 0229 of SIE shows the source carrying shield for both the CS137 and the Co60 sources. REMCO Model HT-1 and HT-2 source handling tools are used with the CS137 and Co60 sources.

RADIATION PROTECTION PROGRAM - Radiation Safety instructions will be provided by the Radiation Safety Officer to all employees involved with radioactive materials. Only approved handling tools are used when working with radioactive materials. Each individual working with radioactive materials will be supplied with a beta, gamma, neutron film badge and they will be instructed to wear their badge whenever working with radioactive sources. Geo-Log, Inc. uses a TLD badge service from Nuclear Sources & Services, Inc., Houston, Texas.

WASTE DISPOSAL - We will generate no radioactive waste. Any sealed sources will be returned to the source supplier when no longer needed or found to be leaking.

LEAK TESTING PROCEDURES - Geo-Log, Inc. performs leak tests on each source every six (6) months using Gulf Nuclear, Inc.'s Leak Test Kit, Model LTK-1. Gulf Nuclear monitors the results, sending the leak test results to this office where copies are made to be placed aboard each vehicle carrying a source. The instructions printed in the kit are followed in the performance of leak testing.

SURVEY PROCEDURES - The logging tool, vehicle and well sites are surveyed for contamination as follows:

- 1) A record is kept at start and stop of drill period as logging vehicles are surveyed inside and out, with the source in front and rear shields, and without source in shield.
- 2) Daily, each borehole is surveyed and findings recorded before and after logging each hole. The surface of the shield is surveyed when source is taken out each day, and when source is returned to shield at conclusion of work day.

Copies of all surveys are kept in a central file at the home office.

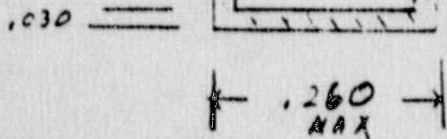
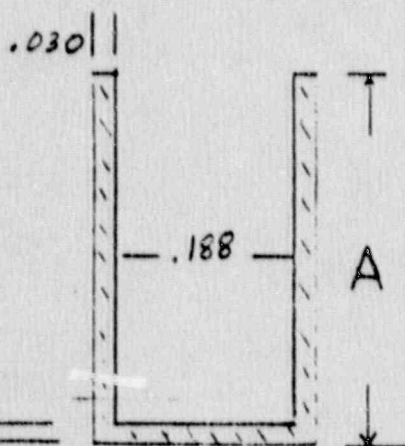
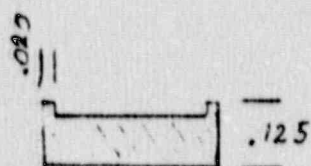
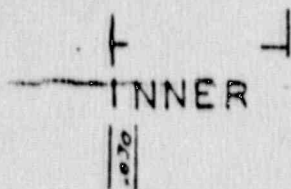
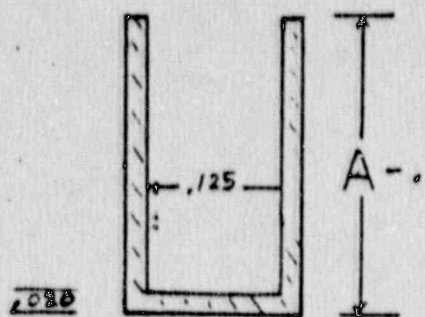
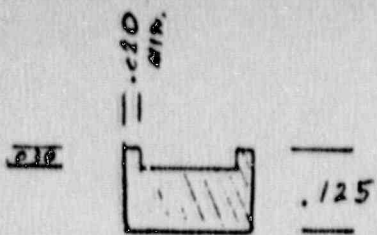
CALIBRATION OF SURVEY METERS - Geo-Log, Inc. has the facilities to perform the calibration of survey meters on its premises. The procedures are outlined in the booklet, "The IC-50 Calibrator" and these instructions are followed as presented by Gulf Nuclear, Inc., Houston, Texas, the manufacturer of the calibrator.

Mr. Marshall B. Broome and Mr. Floyd H. Moore, Jr., will be performing the calibrations. Mr. Broome has training, both formal and on the job, which has been received at Well Surveys, Inc., Tulsa, Oklahoma (7 years); the Western Company, Fort Worth, Texas (2 years); and Century Geophysical, Tulsa, Oklahoma (5 years). He has worked with 10 mCi 226Ra, 300 mCi 226RaBe, 300 mCi 227AcBe, 5 Ci 241AmBe, 500 mCi 60Co, 500 mCi 137Cs. Mr. Moore has training both formal and on the job, received at Geo-Log, Inc. over the past 7 years. The formal training consisted of a Radiological Safety and Procedures Course taught by Alfred E. Caswell, Jr., formerly Vice President of SIE, Inc., Fort Worth, Texas. Mr. Moore has worked with 4 mCi 60Co, 125 mCi 137Cs, 1 Ci 241 AmBe and 1mCi 226Ra.

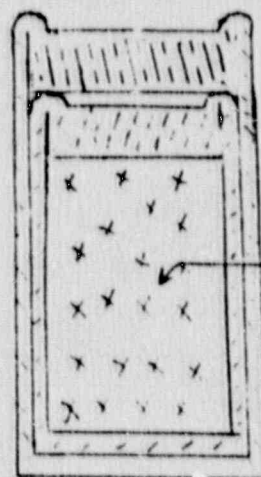
RADIATION SAFETY PROCEDURES - Mr. M. B. Broome, President of Geo-Log, Inc., will both manage the Radiation Program and serve as Radiation Safety Officer. He will have the overall responsibility for the safe handling of the radioisotopes used by Geo-Log. His responsibilities will include:

- a. On the job training of personnel in the safe handling of radioisotopes.
- b. Approval of equipment and techniques for the storage, use and disposal of radioisotopes.
- c. Supply the personnel with TLD badges as required.
- d. Maintain radiation exposure records.
- e. Making sure that Geo-Log, Inc. complies with the applicable regulations of the Nuclear Regulatory Commission, and all states in which Geo-Log, Inc. performs well logging services.

Revision No.1 Outer capsule dia.Changed
 From .248 to .260 & Wall thickness
 thickness from .030 to .020
 on both capsules



OUTER



SOURCE MTL.
 MOLECULAR
 SIEVE

"A" UP TO 1.25 INCHES

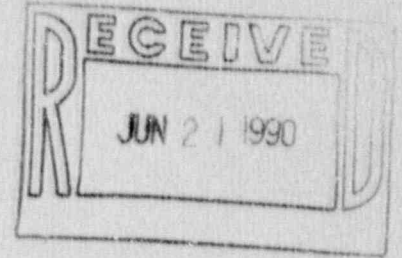
REVISIONS			NUCLEAR ENVIRONMENTAL ENGINEERING INC		
NO.	DATE	BY			
1	10/28/96	[Signature]			
2					
3			DRAWN BY	SCALE	MATERIAL
4			CHK'D	DATE	DRAWING NO.
5			TRACED	APP'D	A-33



GEO-LOG, INC.

19 June 1990

205 INDUSTRIAL BLVD.
GRANBURY, TEXAS 76048
817-326-5321



United States Nuclear Regulatory Commission
Region IV
611 Ryan Plaza Drive - Suite 1000
Arlington, TX 76011

Attn: Mr. Charles L. Cain
Chief, Nuclear Mat'ls & Licensing

Re: License No. 42-17558-01
Control No. 461 867

Dear Sir;

Geo-Log, Inc. is licensed by Texas Department of Health- Radiation Control and since the vast majority of our work is in the State of Texas or in an agreement state, we have elected to terminate our NRC license and request the return of our renewal fee.

Thank you for your cooperation.

Sincerely,

Winston Newman
Vice President

JUN 30 1990

Geo-Log, Inc.
ATTN: J. Winston Newman
Vice President
205 Industrial Blvd.
Granbury, Texas 76048

This refers to your letter dated June 19, 1990, informing the Commission that you do not plan to pursue your February 19, 1988, application for renewal of License No. 42-17558-01 and requesting a refund of the \$700 renewal fee.

Please note that Section 170.12(a) of Part 170 of the Commission's regulations, copy enclosed, provides that application fees will be charged irrespective of the Commission's disposition of the application or a withdrawal of the application. If, however, the Commission receives an application accompanied by a fee and it is withdrawn prior to the staff commencing its review, the fee would be refunded. Since the Licensing staff spent considerable time reviewing your application prior to withdrawal, the application fee is not refundable.

If you have any questions, please let us know.

Sincerely,

(Signed) Maurice Messier

Maurice Messier
License Fee & Debt Collection Branch
Division of Accounting and Finance
Office of the Controller

Enclosure:
10 CFR 170

DISTRIBUTION:
License Fee File
OC/DAF
LFDCB R/F (2)
DW/LORRAI/GEO LOG

OFFICE :LFDCB *m*
SURNAME:MMessier:lb
DATE :7/23/90

LFDCB *8*
GJackson
7/26/90

213



GEO-LOG, INC.

5 July 1989

205 INDUSTRIAL BLVD.
GRANBURY, TEXAS 76048
817-326-5321

U.S. Nuclear Regulatory Commission
Medical, Academic & Commercial Safety Branch
Division of Industrial & Medical Safety, NMSS
Washington, D.C. 20555

Re: Lic. #42-17558-01
Control #461 867

Attn: Mr. Anthony N. Huffert

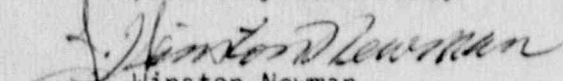
Dear Sir;

This letter is to request a 30 day extension of the response period allowed by your recent letter. Although your letter was not dated, I believe it must have been mailed about mid-June.

I have contracted the assistance of Mid Continent Nuclear Consultants, of Oklahoma City, to help prepare our renewal request to conform to the requirements of 10 CFR. Mid Continent feels that the 30 day extension (Approx. 1 Sept.) will allow adequate time to properly prepare the required documents.

Your favorable consideration of our request is most earnestly solicited.

Respectfully Submitted,


J. Winston Newman
Vice President

cc: U.S.N.R.C.- Region IV
611 Ryan Plaza Dr.-Suite 1000
Arlington, TX 76011

Attn: Mr. Charles L. Cain

U.S. N.R.C.
MEDICAL BRANCH

90 JUL 10 A9:13

RECEIVED

JUN 08 1989

Geo-Log, Inc.
ATTN: Floyd H. Moore, Jr.
Vice President/RSO
205 Industrial Blvd.
Granbury, TX 76048

Gentlemen:

This refers to your application dated February 19, 1989 for renewal of License No. 42-17558-01. Your application has been forwarded to NRC Headquarters for review due to increased regulatory workloads at the Region IV office. The application will be processed by both offices; however, your response to this letter should be sent directly to this office.

NRC issued 10 CFR Part 39, "Licenses and Radiation Safety Requirements for Well-Logging," on March 17, 1987, which became effective on July 14, 1987. A copy of this regulation is enclosed. About the same time, NRC prepared additional licensing guidance for its well-logging applicants in conjunction with 10 CFR Part 39. This new guidance, entitled "Guide for the Preparation of Applications for the Use of Radioactive Material in Well Logging Operations," is also enclosed for your reference.

Your application for license renewal frequently references previously submitted license application information, which could not have met 10 CFR Part 39 requirements. We therefore request that you resubmit your application using the current guidance. We recommend that you do not reference previously submitted information and that you organize your response as suggested in the new licensing guide. Our experience shows that if you merely reference previously submitted information, the final licensing documents are frequently complex and cumbersome for licensing and inspection purposes. This problem would be compounded by the additional requirements imposed under 10 CFR Part 39.

The information you provide in the application must be sufficient to demonstrate that your well logging program will meet 10 CFR Part 39 requirements. In order to make this determination, you must provide all of the applicable information requested in the enclosed guide. If you do not provide this information, it may be necessary to deny your application for license renewal. Such action could restrict your activities within NRC's jurisdiction.

Your revised application should address each applicable item of the guide. Attention should be directed to the following items in particular:

1. Confirm that Geo-Log, Inc. does not possess radioactive material at field station locations, as defined by 10 CFR 39.2, within NRC jurisdiction. (Reg. Guide Item 3)

2. Since you are modifying the limits for americium-241 and cesium-137 sealed sources and are requesting possession of iodine-131 and iridium-192 tracer materials, please provide a copy of your Texas possession license.
3. Provide information on the physical and chemical form of the tracer materials as purchased by your company. Indicate whether the iridium and iodine tracers are purchased in "ready-to-use" form. (Reg. Guide item 5)
4. Submit an organization chart or description of your corporate structure, as required by 10 CFR 39.13(e). Provide specific information on the radiation safety training and experience of the Radiation Safety Officer (RSO). Also, the duties of the RSO should be expanded to include subitems (a) through (w) on pages 13 and 14 of the Guide. (Reg. Guide Item 7)
5. Review the 10 CFR 39 training requirements, as well as the corresponding guidance in the enclosed Guide, and submit all necessary information about your training program. Please note that you must name each contractor you plan to use to provide the training required by 10 CFR 39.61(e). In addition, you should submit information on your in-house training program and your annual safety reviews. (Reg. Guide Item 8)
6. If you conduct operations at field stations within NRC jurisdiction, submit drawings or sketches showing where radioactive materials, including radioactive wastes, will be used or stored at the facility. Also, describe the safety equipment available for workers at temporary job sites. (Reg. Guide Item 9)
7. Confirm that a copy of 10 CFR 39.15 is included with the written agreement between Geo-Log, Inc. and the well owner or operator when using sealed sources. (Reg. Guide Item 10.1)
8. Indicate the typical quantity of iodine-131 and iridium-192 used in tracer studies and, if applicable, describe your bioassay program. Note that a bioassay program is required unless you confirm that no individual will handle 50 millicuries of iodine-131 at any one time, or within a 5 day period. Information about bioassay program requirements can be found in the enclosed copy of Regulatory Guide 8.20, "Applications of Bioassay for I-125 and I-131." (Reg. Guide item 10.3)
9. Describe the instrumentation that will be available to satisfy the requirements of 10 CFR 39.33(b). (Reg. Guide Item 10.4)
10. Submit information regarding your annual inspection program, as required by 10 CFR 39.13(d). (Reg. Guide Item 10.5)

11. Review the guidance provided for operating and emergency procedures and revise your procedures accordingly. Reference the appropriate Reg. Guide subitem when providing this information. Also, you should provide further explanation in section 8 of your "Radiation Safety Procedures" about the proper application of the "Safety Chart" illustrated in Figure 6. Direct application of this chart would result in personnel receiving the maximum dose permitted under current regulations, which should not be the goal of your radiation safety program. Include wording that reminds personnel of ALARA when using this safety chart. In addition, submit a copy of your procedures for using sealed sources in fresh water aquifers without surface casing, as required by Section 39.51. Refer to pages 30 and 31 of the Guide for further information. (Reg Guide Item 10.6)
12. Provide information on your leak testing, semiannual physical inventory, and equipment maintenance programs, as required by Sections 39.13, 39.37 and 39.43, respectively. (Reg. Guide Items 10.8 and 10.9)
13. Submit written procedures for removal or maintenance of a sealed source or source holder, if you conduct these activities. (Reg. Guide Item 10.10)
14. Confirm that you do not intend to perform operations, such as drilling, cutting or chiseling, to remove a sealed source which is stuck in a source holder. (Reg. Guide Item 10.11)
15. Confirm that you do not intend to open, repair or modify any sealed source. (Reg. Guide item 10.12)

We have also enclosed a copy of 10 CFR 30 for your information. 10 CFR 30.35 provides new financial assurance requirements for NRC licensees that possess materials exceeding certain limits. The maximum possession limit for americium-241 sealed sources is 100 curies. Because your current NRC license does not limit the total number of americium-241 sealed sources you can possess, you may be subject to the requirements of 10 CFR 30.35.

An alternative to providing financial assurance would be to limit your americium-241 possession to 100 curies. A license condition limiting your possession of americium-241 could be incorporated into this license renewal if it were acceptable to you. If you choose not to address the financial assurance requirements during this renewal, you would be required to submit the necessary information by July 27, 1990. Please indicate your preference when responding to this letter.

Our review of your application will continue upon receipt of the above information. Please reply, in duplicate, within 45 days from the date of this letter and reference Control No. 461867.

Floyd H. Moore, Jr.

- 4 -

If you have any questions, please contact me at (301) 492-0529.

Sincerely,

151

Anthony M. Huffert
Medical, Academic, and Commercial
Use Safety Branch
Division of Industrial and Medical
Nuclear Safety, NMSS

Enclosures: As stated

DISTRIBUTION:

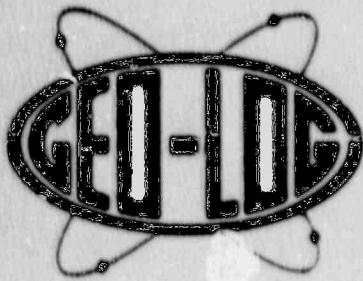
IMNS Central File
NMSS r/f
THuffert

JGlenn
MLamastra
NRC File Center

DPowers, RIV
IMAB r/f
BCarrico

OFC: IMAB *AK* : IMAB *AK*
NAME: THuffert/TH/ht : BCarrico
DATE: 06/08/89 : 06/15/89

OFFICIAL RECORD COPY

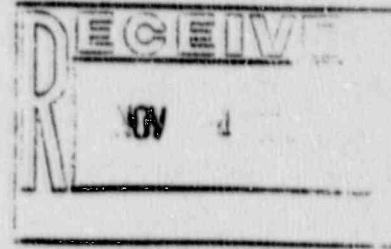


GEO-LOG, INC.

205 INDUSTRIAL BLVD.
GRANBURY, TEXAS 76048
817-326-5321

3 November 1988

United States Nuclear Regulatory Commission
Region IV
611 Ryan Plaza Drive- Suite 1000
Arlington, TX 76011



Attn: Mr. Charles L. Cain, Chief
Nuclear Mat'ls & Licensing Sect.

Re: License No. 42-17558-01
Control No. 461 867

Dear Sir;

Due to the termination of employment of Floyd H. Moore, Jr. it is necessary that we request that our license be amended, replacing the name "Floyd H. Moore, Jr." with "J. Winston Newman" wherever appropriate, (eg. Items 7, 8, & 10) in our letter of application dated 19 Feb 88 and in Item 12 of our existing license.

Mr. Newman has eighteen years experience in dealing with radio-isotopes and is familiar with U.S.N.R.C. Regulations and has the knowledge to apply appropriate radiation protection rules, standards and practices, having served as Radiation Safety Officer for S.I.E., Inc. in 1984/85.

Your favorable consideration of this request is appreciated.

Sincerely,

M.M. Hawthorne
President

M.M. Hawthorne

encl: copy of application dated 19 Feb 88
copy of letter from Mid Continent Nuclear Cons.

*2384
x 170
SIT
1/31/89
Newman*
*(Amend to
license
3/12/89)*

application

41-2-111

APPLICATION FOR MATERIAL LICENSE

INSTRUCTIONS: SEE THE APPROPRIATE LICENSE APPLICATION GUIDE FOR DETAILED INSTRUCTIONS FOR COMPLETING APPLICATION. SEND TWO COPIES OF THE ENTIRE COMPLETED APPLICATION TO THE NRC OFFICE SPECIFIED BELOW

APPLICATIONS FOR DISTRIBUTION OF EXEMPT PRODUCTS FILE APPLICATIONS WITH:

U.S. NUCLEAR REGULATORY COMMISSION
DIVISION OF FUEL CYCLE AND MATERIAL SAFETY, NMSS
WASHINGTON, DC 20540

ALL OTHER PERSONS FILE APPLICATIONS AS FOLLOWS, IF YOU ARE LOCATED IN:

CONNECTICUT, DELAWARE, DISTRICT OF COLUMBIA, MAINE, MARYLAND, MASSACHUSETTS, NEW HAMPSHIRE, NEW JERSEY, NEW YORK, PENNSYLVANIA, RHODE ISLAND, OR VERMONT, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION I
NUCLEAR MATERIALS SAFETY SECTION
831 PARK AVENUE
KING OF PRUSSIA, PA 19406

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

U.S. NUCLEAR REGULATORY COMMISSION, REGION II
NUCLEAR MATERIALS SAFETY SECTION
101 MARIETTA STREET, SUITE 2900
ATLANTA, GA 30333

IF YOU ARE LOCATED IN:

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

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

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

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

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

U.S. NUCLEAR REGULATORY COMMISSION, REGION V
NUCLEAR MATERIALS SAFETY SECTION
1450 MARIA LANE, SUITE 210
WALNUT CREEK, CA 94698

PERSONS LOCATED IN AGREEMENT STATES SEND APPLICATIONS TO THE U.S. NUCLEAR REGULATORY COMMISSION ONLY IF THEY WISH TO POSSESS AND USE LICENSED MATERIAL IN STATES SUBJECT TO U.S. NUCLEAR REGULATORY COMMISSION JURISDICTION.

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

- A. NEW LICENSE
- B. AMENDMENT TO LICENSE NUMBER _____
- C. RENEWAL OF LICENSE NUMBER 42-17558-01

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

GEO-LOG, INC.
205 Industrial Blvd.
Granbury, Texas 76048

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

205 Industrial Blvd; Granbury, Texas 76048 and at temporary job sites anywhere in the United States where the Nuclear Regulatory Commission maintains jurisdiction for regulating the use of licensed materials.

4. NAME OF PERSON TO BE CONTACTED ABOUT THIS APPLICATION

Floyd H. Moore, Jr.

TELEPHONE NUMBER

(817) 326-5321

SUBMIT ITEMS 6 THROUGH 11 ON 8 1/2 x 11" PAPER. THE TYPE AND SCOPE OF INFORMATION TO BE PROVIDED IS DESCRIBED IN THE LICENSE APPLICATION GUIDE.

6. RADIOACTIVE MATERIAL
a. Element and mass number, b. chemical and/or physical form, and c. maximum amount which will be possessed at any one time.

6. PURPOSE(S) FOR WHICH LICENSED MATERIAL WILL BE USED.

7. INDIVIDUAL(S) RESPONSIBLE FOR RADIATION SAFETY PROGRAM AND THEIR TRAINING AND EXPERIENCE.

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

9. FACILITIES AND EQUIPMENT.

10. RADIATION SAFETY PROGRAM.

11. WASTE MANAGEMENT.

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

FEE CATEGORY: Well logging-A AMOUNT ENCLOSED \$700.00

13. CERTIFICATION. (Must be completed by applicant) THE APPLICANT UNDERSTANDS THAT ALL STATEMENTS AND REPRESENTATIONS MADE IN THIS APPLICATION ARE BINDING UPON THE APPLICANT.

THE APPLICANT AND ANY OFFICIAL EXECUTING THIS CERTIFICATION ON BEHALF OF THE APPLICANT NAMED IN ITEM 2, CERTIFY THAT THIS APPLICATION IS PREPARED IN CONFORMITY WITH TITLE 10, CODE OF FEDERAL REGULATIONS, PARTS 30, 32, 33, 34, 35, AND 40 AND THAT ALL INFORMATION CONTAINED HEREIN IS TRUE AND CORRECT TO THE BEST OF THEIR KNOWLEDGE AND BELIEF.

WARNING: 18 U.S.C. SECTION 1001 ACT OF JUNE 25, 1948, 62 STAT. 749 MAKES IT A CRIMINAL OFFENSE TO MAKE A WILLFULLY FALSE STATEMENT OR REPRESENTATION TO ANY DEPARTMENT OR AGENCY OF THE UNITED STATES AS TO ANY MATTER WITHIN ITS JURISDICTION.

SIGNATURE - CERTIFYING OFFICER

Floyd H. Moore, Jr.

TYPED/PRINTED NAME

Floyd H. Moore, Jr.

TITLE

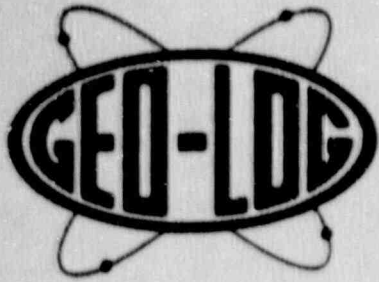
Vice President/ R.S.O.

DATE

19 Feb 88

FOR NRC USE ONLY

TYPE OF FEE	FEE LOG	FEE CATEGORY	COMMENTS	APPROVED BY
AMOUNT RECEIVED	CHECK NUMBER			DATE
				462248



GEO-LOG, INC.

205 INDUSTRIAL BLVD.
GRANBURY, TEXAS 76048
817-326-5321

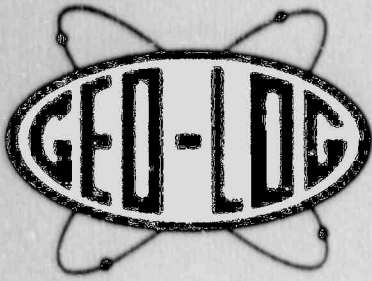
NUCLEAR REGULATORY LICENSE RENEWAL 42-17558-01

ITEM 5

A.	B.	C.
(1) Americium-241	Sealed Source (NSSI Model AN-HP)	No single source to exceed 20 Curies
(2) Americium-241	Sealed Source (GNI model 71-1)	No single source to exceed 5 Curies
(3) Cobalt-60	Sealed Source (GNI model VL-1)	No single source to exceed 4 Millicuries
(4) Cesium-137	Sealed Source (GNI model VL-1)	No single source to exceed 125 Millicuries
(5) Cesium-137	Sealed Source (GNI model VL-1 or CSV)	No single source to exceed 2 Curies
(6) Iridium-192	Sealed Source (GNI model VL-1)	No single source to exceed 150 Millicuries
(7) Iodine-131	Any	200 Millicuries total (Not to exceed 40 Millicuries per unit received)
(8) Iridium-192	Any	200 Millicuries total (Not to exceed 40 Millicurie per unit received)

ITEM 6

Sources 1 thru 5	'For use in Hazardous/toxic waste site investigation, and mineral, oil, and gas well logging.'
Source 6	'For use in Hazardous/toxic waste site investigation, and mineral, oil, and gas well logging in uncased wells through potable water.'
Sources 7 and 8	'For use in Tracer Studies in oil and gas wells.'



GEO-LOG, INC.

205 INDUSTRIAL BLVD.
GRANBURY, TEXAS 76048
817-326-5321

NUCLEAR REGULATORY LICENSE RENEWAL

42-17558-01

ITEM 7

Licensed material shall be used by, or under the supervision and in the physical presence of, individuals designated by the Radiation Protection Officer - Floyd H. Moore, Jr.' *Reference current license item 12*

ITEM 8

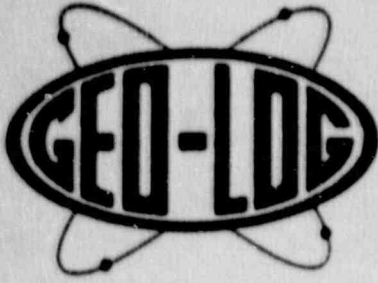
'Floyd H. Moore, Jr., Vice President and R.S.O. of Geo-Log, Inc. will be present any time any individual is in a restricted area. The only restricted area at Geo-Log is the source storage facility. All individuals who use radioactive materials have been through an approved Radiation Safety Course as well as having been instructed in Geo-Log's Safety Procedures.'

ITEM 9

Source Storage Facilities - Our sources when not in use will be stored in the storage facility located at the rear of our company premises at 205 Industrial Blvd.; Granbury, Texas 76048. We have constructed an area away from our shop facility for the storage of the sources. The sources are kept in locked steel tubes buried in the ground and set in concrete inside a locked steel building. Tube length is slightly over 4 feet and the sources are in the bottom 2 feet of each tube. The gamma emitting sources have lead filled steel caps, the neutron emitting sources have waxed filled steel caps. The neutron storage tubes are steel interior tube with an exterior tube of schedule 80 PVC filled with wax. All caps lock to the floor.

When the sources are in use they are stored in approved source storage containers bolted to the frame of the logging vehicle. *reference letter dated November 11, 1982 "Description of Storage Facility"***

U1. 29111

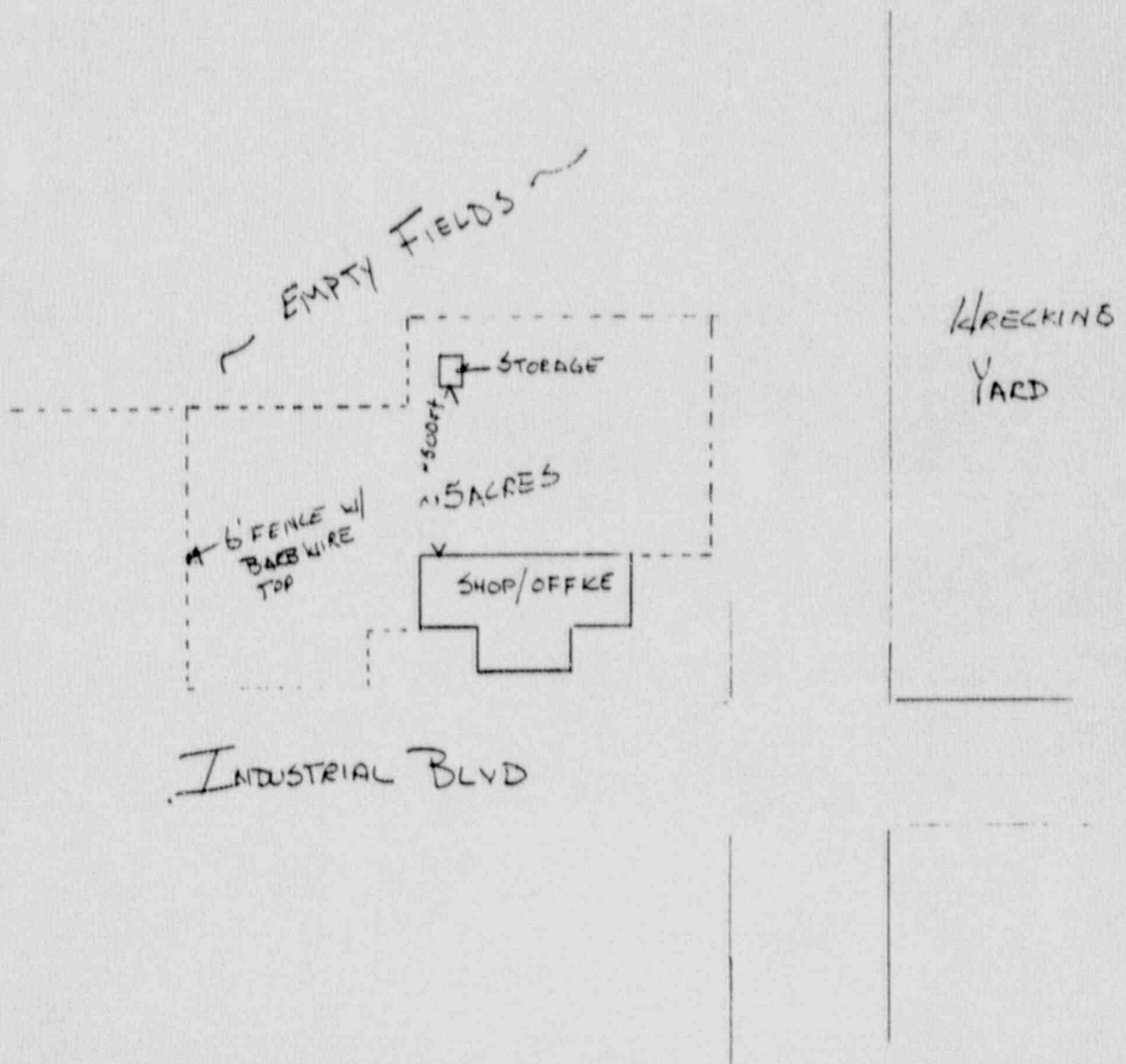


GEO-LOG, INC.

205 INDUSTRIAL BLVD.
GRANBURY, TEXAS 76048
817-326-5321

NUCLEAR REGULATORY LICENSE RENEWAL
42-17558-01

ITEM 9 source storage facilities



SOURCE STORAGE FACILITY



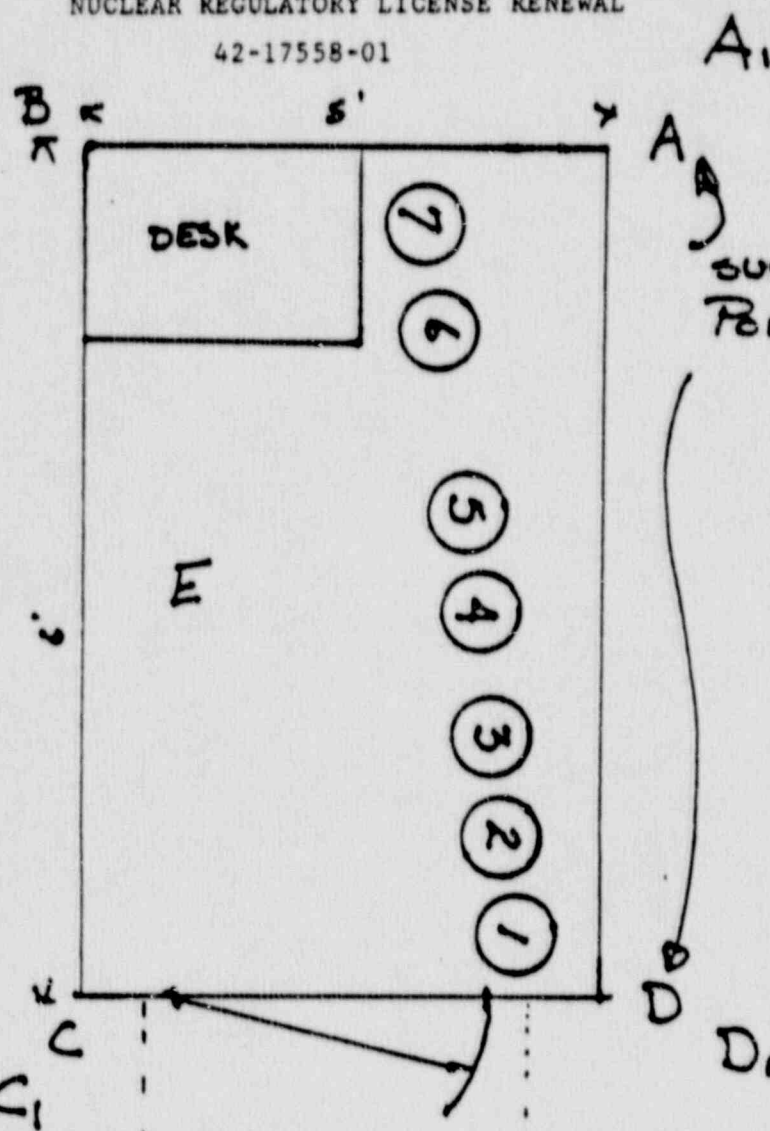
GEO-LOG, INC.

205 INDUSTRIAL BLVD.
GRANBURY, TEXAS 76048
817-326-5321

NUCLEAR REGULATORY LICENSE RENEWAL

42-17558-01

PROPERTY FENCE



SURVEY POINTS

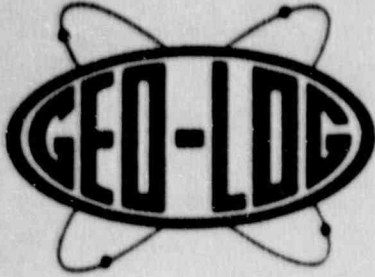
survey points

- A thru D
outside corner of building
- E interior of building
- A₁ thru D₁
3 feet from outside corner of building

storage identification

- sealed Gamma
tube 1
Cobalt 60
- Tube 2
Cesium 137/Iridium 192
- tube 3
spare 11/86
- sealed Neutron
tube 4
Am 241 Be
- tube 5
spare - 11/86
- tracer sources
tube 6
spare 11/86
- tube 7
spare 11/86

NOTES: Tubes 1,2,3,6, & 7 have lead filled top caps.
Tubes 4 & 5 have waxed filled caps and are surrounded with 2 inches of wax top to bottom held in place with 8" id PVC pipe.



GEO-LOG, INC.

205 INDUSTRIAL BLVD.
GRANBURY, TEXAS 76048
817-326-5321

NUCLEAR REGULATORY LICENSE RENEWAL

42-17558-01

ITEM 10

Radiation Safety Program - Radiation Safety instructions will be provided by the Radiation Safety Officer to all employees involved with radioactive materials. Only approved handling tools are used when working with radioactive materials. Each individual working with radioactive materials will be supplied with a beta, gamma, neutron film badge and they will be instructed to wear their badge whenever working with radioactive sources. Geo-Log, Inc. uses a film badge service from Nuclear Sources and Services, Inc. in Houston, Texas - (a copy of their accreditation certificate is enclosed).
Reference also Geo-Log's "RADIATION SAFETY PROCEDURES" handbook

Leak Testing Procedures - ***Reference current license item 13***

Survey Procedures - ***Reference letter dated November 11, 1982*** plus

'Each survey sheet will contain information to uniquely identify the instrument used in making the survey -
MODEL SERIAL NUMBER CALIBRATION DATE as well as
OPERATOR NAME DATE of SURVEY SOURCE SERIAL NUMBER(s)'

Reference also items 14, 15, 16 and 17 of current license - to be included as part of the Radiation Safety Program.

Survey Meter Calibration - ***Reference Letter dated November 11, 1982*** with the following changes - Marshall B. Broome is no longer with Geo-Log, Inc. and as such will no longer calibrate survey meters. Also meters may be sent to Gulf Nuclear, Inc. in Houston, Texas for calibration.

Radiation Safety Procedures - Floyd H. Moore, Jr. Vice President of Geo-Log, Inc. will both manage the Radiation Program and serve as Radiation Safety Officer (***ref current license item 12***). He will have the overall responsibility for the safe handling of the radioisotopes used by Geo-Log, Inc. His responsibilities will include:

- a. On the job training of personnel in the safe handling of radioisotopes
- b. Approval of equipment and techniques for the storage, use, and disposal of radioisotopes.
- c. Supply the personnel with TLD badges as required.
- d. Maintain radiation exposure records.
- e. Making sure that Geo-Log, Inc. complies with the applicable regulations of the Nuclear Regulatory Commission, and all states in which Geo-Log, Inc. performs well logging services.

United States Department of Commerce
National Bureau of Standards



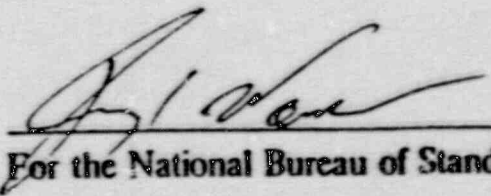
Certificate of Accreditation

NUCLEAR SOURCES & SERVICES, INC.
Houston, TX

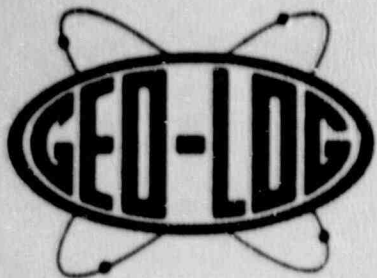
is recognized under the National Voluntary Laboratory Accreditation Program
for satisfactory compliance with criteria established in Title 15, Part 7 Code of Federal Regulations for:
providing specific Personnel Radiation Dosimetry Processing Services



Effective until January 1, 1990


For the National Bureau of Standards

ITEM 10
radiat. safety program



GEO-LOG, INC.

205 INDUSTRIAL BLVD.
GRANBURY, TEXAS 76048
817-326-5321

NUCLEAR REGULATORY LICENSE RENEWAL
42-17558-01

ITEM 11

We will generate no radioactive waste. Any sealed sources will be returned to the source supplier when no longer needed or found to be leaking. Disposal records will be kept on file in the office. Tracer material containers will be stored in a locked container located in the source storage building, until they can be either returned to the supplier or until they reach normal background at which time they will be disposed of - and not reused.

Mid Continent Nuclear Consultants

4305 Foxglove Lane
Oklahoma City, OK 73120
(405) 751-6937

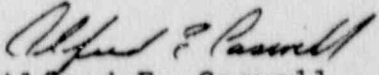
October 31, 1988

To Whom It May Concern:

This is to confirm that J. Winston Newman successfully completed a two day Radiological Safety Course on November 17th, and 18th, 1970. The course was held at the offices of the Radiation Engineering and Manufacturing Company, Ft. Worth, Texas. I conducted the course.

A copy of the course examination is attached.

AEC:cc


Alfred E. Caswell

Winston Newman

Date Nov 18, 1970

FINAL TEST

92

1. The nucleus of an atom consists primarily of:
 - a. neutrons and electrons bound together by binding energy
 - b. electrons and protons
 - c. neutrons and protons which are held together by binding energy
 - d. positrons and negatrons

2. Electrons are:
 - a. negatively charged particles with a mass of one
 - b. neutral and have a mass of one
 - c. positively charged particles with a mass of one
 - d. negatively charged particles with essentially no mass

3. Protons are:
 - a. negatively charged particles with a mass of one
 - b. neutral and have a mass of one
 - c. positively charged particles with a mass of one
 - d. negatively charged particles with essentially no mass

4. The isotope ${}_{15}\text{P}^{31}$ has:
 - a. 16 neutrons in the nucleus
 - b. 15 neutrons in the nucleus
 - c. 31 neutrons in the nucleus
 - d. 46 neutrons in the nucleus

5. Alpha particles possess:
 - a. little ionizing power but relatively great penetrating power
 - b. a mass of one and a negative charge of two
 - c. great ionizing power but relatively little penetrating power
 - d. a mass of two and a negative charge of two

6. Gamma radiation consists of:

- a. electromagnetic radiations with great penetrating power
- b. Positively charged particles with relatively little penetrating power
- c. negatively charged radiations with great penetrating power
- d. electromagnetic radiations originating in the orbits of atom

7. Neutrons are easily shielded by:

- a. lead due to its high density
- b. wax due to its high hydrogen content
- c. wax due to its high density
- d. aluminum

8. The basis of most radiation detection is ionization. Ionization is simply:

- a. the knocking of an electron from the orbit of an atom thereby creating an ion
- b. the creation of light photon within the detector
- c. the removal of a proton from the nucleus of an atom thereby creating an ion
- d. the raising of the energy level of an atom

9. The basic difference in the operating characteristics between an ionization chamber, proportional counter and Geiger-Muller detector is:

- a. the geiger-Muller detectors and proportional counters detect gamma radiation only
- b. in the input voltage
- c. the scintillation effect
- d. in the output voltage

10. Scintillation detectors operate on the basis of:
- ionization taking place within certain organic and inorganic crystals
 - the separation of alpha, beta and gamma radiation within organic phosphors
 - (c) the production of a photon of light within certain organic and inorganic phosphors
 - ionization chambers
11. The _____ is the quantity of a radioactive nuclide disintegrating at the rate of 3×10^{10} atoms per second.
12. The dose unit Roentgen applies to Gamma & radiation only.
13. The Relative Biological Effectiveness factor for fast neutrons is 10.
14. Half life is the time required for the activity of a given radioactive isotope to decrease to half of its initial value due to radioactive decay.
15. We normally refer to the energy of ionizing radiation in units of Million Electron Volts (MEV)
16. A total body dose of 500-1000 will cause nausea and vomiting almost immediately with death in one to two weeks.
17. The whole body tolerance for a calendar quarter (13 weeks) established by the AEC and State of Texas is 125 rems.
18. The quarterly tolerance for the hands is 18.75 rems.
19. The three safety factors to be considered at all times when working with radioactive material are Time, Distance and Shielding.
- 11/22/66

20. Sealed logging sources are to be leak tested every six months or 180 days or less.

- a. True
- b. False

21. Determine the dose rate at one foot from a 12 millicurie Cesium-137 source. Effective energy of Cesium-137 is 0.55 Mev.

$$6 \times 12 \times .55$$

$$\begin{array}{r} 72 \\ 155 \\ \hline 360 \\ 360 \\ \hline 720 \end{array}$$

ANS. 39.6 MR/Hr

22. Twenty days ago we received a twenty millicurie shipment of Iodine-131. How much do we have today? Half life of Iodine-131 is eight (8) days.

$$187$$

23. The dose rate at three feet from a neutron source is 42 mrem/hr. What would be the dose rate at nine feet?

$$42 (9)^2 = I (9)^2$$

$$42 (9) = I (81)$$

$$\frac{42}{81} = \frac{I}{9}$$

-4
Ans: .21 MREM/HR

24. What is the neutron dose rate (mrem/hr) at 100 centimeters (approximately 40 inches) from a neutron logging source which emits 6×10^6 neutrons/second?

$$\frac{6000,000}{1257}$$

$$\frac{1257}{1000} = 1257000$$

-4

$$1257 \overline{) 6000000}$$

$$\begin{array}{r} 4773 \\ 1257 \times 4773 = 5999911 \\ \hline 6000000 \\ \hline 9720 \\ 8799 \\ \hline 9210 \\ 8799 \\ \hline 4110 \end{array}$$

$$\begin{array}{r} 477.3 \\ .14 \\ \hline 19092 \\ 4773 \\ \hline 22599 \end{array}$$

Ans: 66.8 MREM/HR



GEO-LOG, INC.

CORPORATE OFFICE
193 INDUSTRIAL BLVD.
MCKINNEY, TEXAS 75069
(214) 542-9333

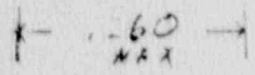
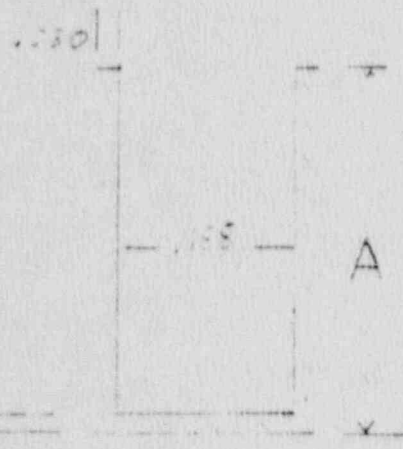
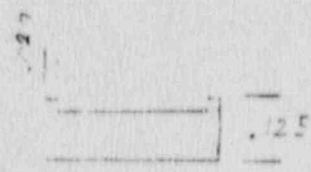
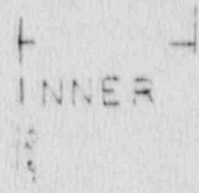
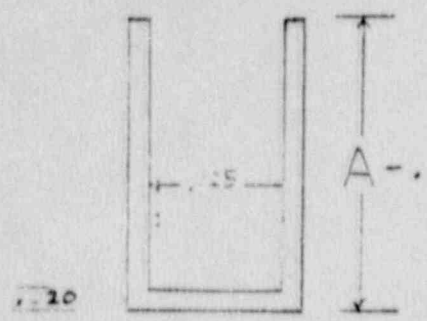
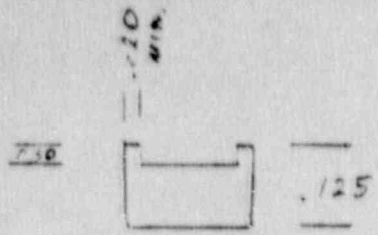
TRAINING AND EXPERIENCE
OF MARSHALL B. BROOME
RADIATION SAFETY OFFICER

Training, both formal and on the job, has been received at Well Surveys, Inc., Tulsa, Oklahoma (7 years); the Western Company, Fort Worth, Texas (2 years); Century Geophysical, Tulsa, Oklahoma (9 years); and Geo-Log, Inc., McKinney, Texas (6½ years). Isotopes and quantities worked with are as follows:

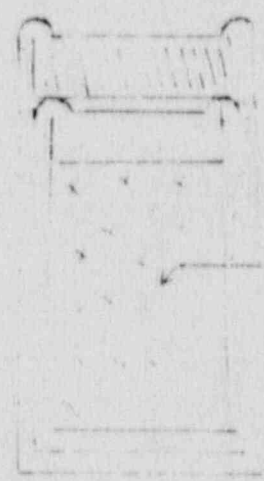
<u>Isotope</u>	<u>Quantity</u>
226 Ra	10 mCi
226 RaBe	300 mCi
227 AcBe	300 mCi
241 AmBe	5 Ci
60 Co	500 mCi
137 Cs	500 mCi

13101

Revision No.1 Outer capsule dia.Changed
 From .248 to .260 & Wall
 thickness from .030 to .020
 on both capsules



OUTER



SOURCE INTL.
 MOLECULAR
 SIEVE

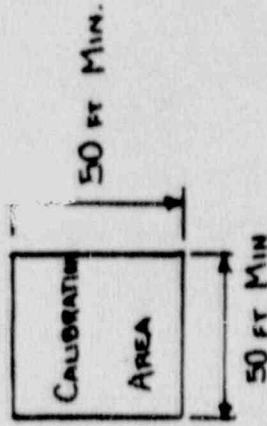
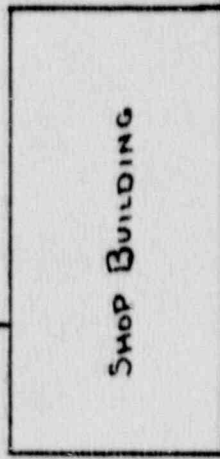
"A" UP TO 1.25 INCHES

REVISIONS			NUCLEAR ENVIRONMENTAL ENGINEERING INC		
NO.	DATE	BY			
1	10/28/76		VL-1 SOURCE		
2					
3			DRAWN BY	SCALE	MATERIAL
4			CHK'D	DATE	DRAWING NO.
5			TRACED	APP'D	A-33

INDUSTRIAL BLVD.

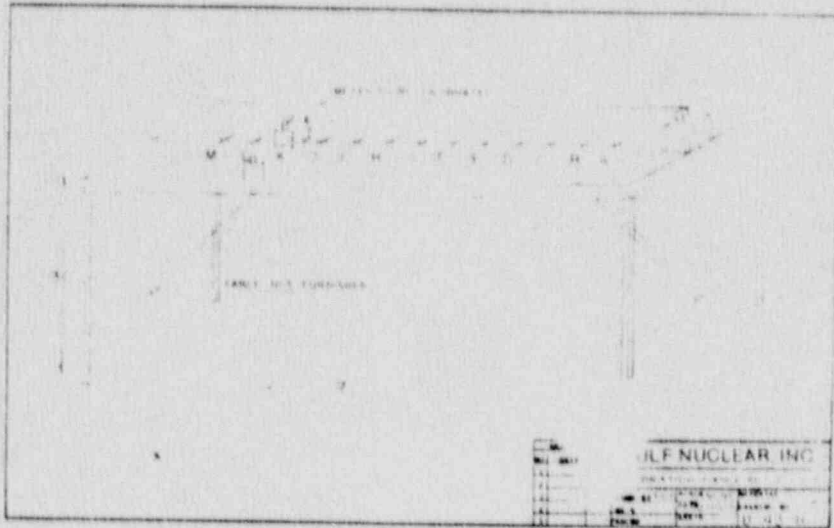
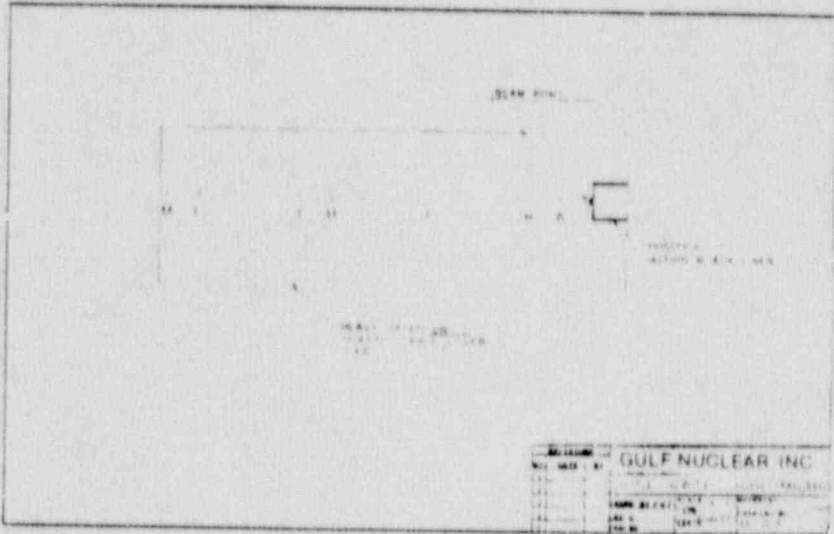
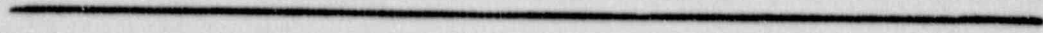
6 FT CHAIN LINK W/ 3 STRANDS BARBED WIRE AROUND ALL PROPERTY

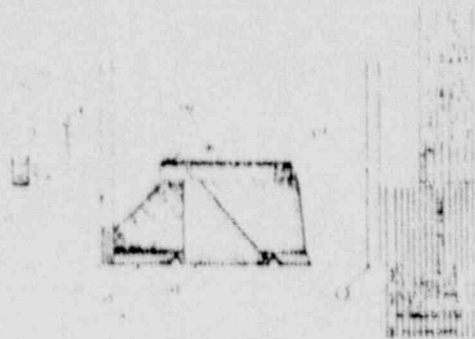
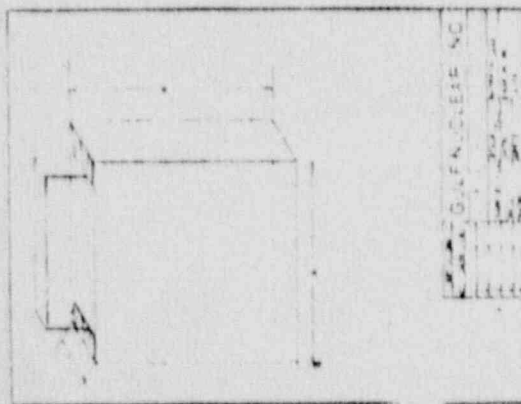
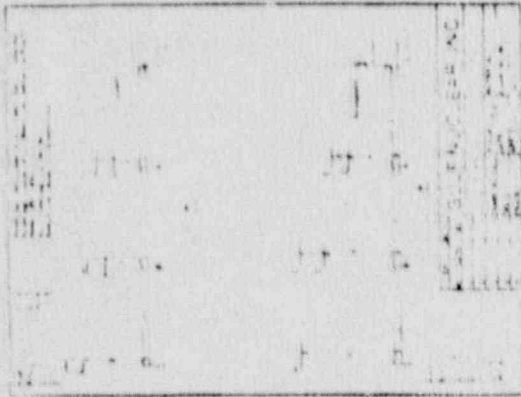
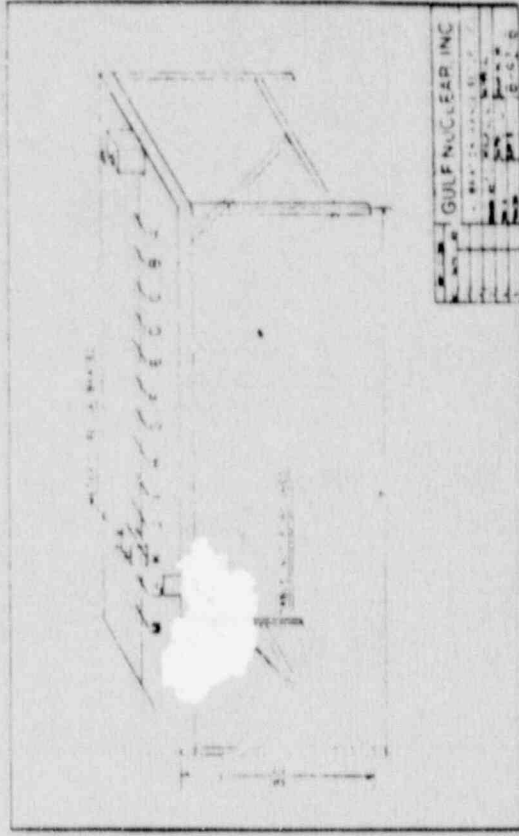
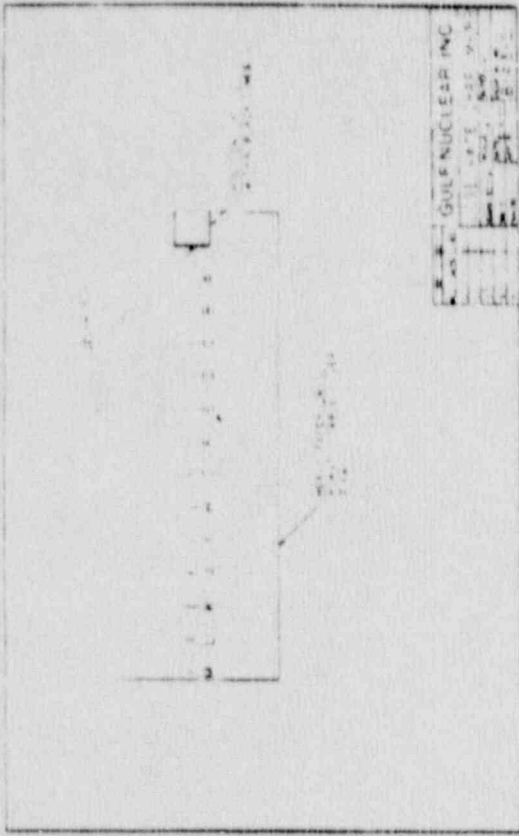
3 ACRES



CALIBRATION AREA
GED-LOG, INC
30 OCT 80

NO SCALE
7m. 1/2





**U. S. NUCLEAR REGULATORY COMMISSION
MATERIALS LICENSE**

This Copy is For Your Files

3d-492-7000
427-4240

Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974 (Public Law 93-438), and Title 10, Code of Federal Regulations, Chapter 1, Parts 80, 31, 32, 33, 34, 35, 36, 40 and 70, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess, and transfer byproduct, source, and special nuclear material designated below; to use such material for the purpose(s) and at the place(s) designated below; to deliver or transfer such material to persons authorized to receive it in accordance with the regulations of the applicable Part(s); and to import such byproduct and source material. This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, as amended, and is subject to all applicable rules, regulations and orders of the Nuclear Regulatory Commission now or hereafter in effect and to any conditions specified below.

Licensee		
1. Geo-Log, Inc.		3. License number 42-17550-01
2. P. O. Box 820 Plano, Texas 75074		4. Expiration date November 30, 1992
		5. Docket or Reference No.
6. Byproduct, source, and/or special nuclear material	7. Chemical and/or physical form	8. Maximum amount that licensee may possess at any one time under this license
A. Americium 241:Be	A. Sealed sources (Nuclear Sources and Services, Inc., Model AM-HP, or Gulf Nuclear, Inc. Model 71-1)	A. Six (6) sources of one (1) curie each
B. Cobalt 60	B. Sealed sources (Gulf Nuclear, Inc. Model VL-1 or Gamma Industries VD(HP))	B. Twenty (20) sources of four (4) millicurie each
C. Cesium 137	C. Sealed sources (Gulf Nuclear Model VL-1 or Gamma Industries Model VD (HP))	C. Six (6) sources of one hundred twenty-five (125) millicuries each

9. Authorized use:

a. through C. Well logging for mineral exploration.

CONDITIONS

10. Licensed material shall be used only at temporary job sites of the licensee anywhere in the United States where the Nuclear Regulatory Commission maintains jurisdiction for regulating the use of licensed material.

MATERIALS LICENSE

Supplementary Sheet

License Number 42-17553-01

Docket or
Reference No. _____

(continued)

CONDITIONS

11. The licensee shall comply with the provisions of Title 10, Chapter 1, Code of Federal Regulations, Part 19, "Notices, Instructions and Reports to Workers; Inspections" and Part 20, "Standards for Protection Against Radiation."
12. Licensed material shall be used by, or under the supervision of, M. B. Broome, Steven Hays, Patrick Hughes, Floyd H. Moore, Jr., Kenneth L. Carter, Billy R. Waddle, Michael W. Thomas or Mark A. Slagle. *SEE ANSWER NO. 1*
13. A.(1) Each sealed source containing licensed material, other than Hydrogen 3, with a half-life greater than thirty days and in any form other than gas shall be tested for leakage and/or contamination at intervals not to exceed six months. In the absence of a certificate from a transferor indicating that a test has been made within six months prior to the transfer, a sealed source received from another person shall not be put into use until tested.

(2) The periodic leak test required by this condition does not apply to sealed sources that are stored and not being used. The sources excepted from this test shall be tested for leakage prior to any use or transfer to another person unless they have been leak tested within six months prior to the date of use or transfer.

B. The test shall be capable of detecting the presence of 0.005 microcurie of radioactive material on the test sample. The test sample shall be taken from the sealed source or from the surfaces of the device in which the sealed source is permanently mounted or stored on which one might expect contamination to accumulate. Records of leak test results shall be kept in units of microcuries and maintained for inspection by the Commission.

C. If the test reveals the presence of 0.005 microcurie or more of removable contamination, the licensee shall immediately withdraw the sealed source from use and shall cause it to be decontaminated and repaired or to be disposed of in accordance with Commission regulations. A report shall be filed within 5 days of the test with the U.S. Nuclear Regulatory Commission, Region IV, Office of Inspection and Enforcement, 611 Ryan Plaza Drive, Suite 1000, Arlington, Texas 76012, describing the equipment involved, the test results, and the corrective action taken.

D. Tests for leakage and/or contamination shall be performed by the licensee or by other persons specifically authorized by the Commission or an Agreement State to perform such services.

MATERIALS LICENSE

Supplementary Sheet

License Number 42-17553-01

Docket or
Reference No. _____

(continued)

CONDITIONS

14. Sealed sources containing licensed material shall not be opened.
15. The licensee shall report in writing within 30 days to the nearest U. S. NRC Office of Inspection and Enforcement the loss or abandonment down-hole of any sealed source containing licensed material. The report shall include information regarding isotope, amount, location, depth, method of immobilization, sealing, placarding, and notations to be placed in public records.
16. The licensee may transport licensed material or deliver licensed material to a carrier for transport, in accordance with the provisions of Section 71.5, Title 10, Code of Federal Regulations, Part 71, "Packaging of Radioactive Material For Transport".
17. Except as specifically provided otherwise by this license, the licensee shall possess and use licensed material described in Items 6, 7, and 8 of this license in accordance with statements, representations, and procedures contained in application dated April 18, 1977 and letter dated September 14, 1977.

NOV 11 1977

Date _____

For the U. S. Nuclear Regulatory Commission:
Joseph M. Brown, Jr.
by Radioisotopes Licensing Branch
Division of Materials and Fuel Cycle
Special Licensing

This Copy is For Your Files

FORM NRC 374A
(5 78)

U. S. NUCLEAR REGULATORY COMMISSION
MATERIALS LICENSE
Supplementary Sheet

Page 1 of 1 Pages

License Number 42-17558-01

Docket or
Reference No. _____

Amendment No. 01

Geo-Log, Inc.
193 Industrial Boulevard
McKinney, Texas 75069

In accordance with letter dated June 11, 1980, License Number 42-17558-01
is amended as follows:

The address of the licensee is changed from P. O. Box 828, Plano, Texas 75074
to 193 Industrial Boulevard, McKinney, Texas 75069.

Condition 12. is amended to read:

12. Radioactive material shall be used by, or under the supervision of, individuals designated by Marshall B. Broome. These individuals shall have completed the licensee's training program and a minimum of two weeks on-the-job training with radioactive materials.

JUN 26 1980
JUN 26 1980

Date _____

For the U. S. Nuclear Regulatory Commission

Joseph M. Brown
Material Licensing Branch

Division of Fuel Cycle and
Material Safety
Washington, D. C. 20545

TEXAS DEPARTMENT OF HEALTH
RADIOACTIVE MATERIAL LICENSE

Pursuant to the Texas Radiation Control Act and Texas Department of Health regulations on radiation, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess and transfer radioactive material listed below; and to use such radioactive material for the purpose(s) and at the place(s) designated below. This license is subject to all applicable rules, regulations and orders of the Texas Department of Health now or hereafter in effect and to any conditions specified below.

LICENSEE

1. Name **Geo-Log, Inc.**
ATTN: M.B. Broome
2. Address **193 Industrial Blvd.**
McKinney, Texas 75069

This license issued pursuant to and in accordance with

APPLICATION LETTER _____

Dated: **June 15, 1979 & Aug. 28, 1979**

Signed By: **M.B. Broome**

3. License Number	Amendment Number
5-1944	20

PREVIOUS AMENDMENTS ARE VOID

4. Expiration Date

July 31, 1980

RADIOACTIVE MATERIAL AUTHORIZED

5. Radioisotope	6. Form of Material	7. Maximum Activity*	8. Authorized Use
Am-241	A. Sealed Sources (NSSI AN-HP or GNI 71-1)	A. 6 sources of 1 Ci. each Total: 6 Ci.	A. through C. well logging mineral exploration.
Co-60	B. Sealed Sources (GNI VL-1 or GI VD-HP)	B. 20 sources of 4 mCi ea. Total: 80 mCi.	B. See Above.
Cs-137	C. Sealed Sources (GNI VL-1 or GI VD-HP)	C. 6 sources of 125 mCi. ea.	C. See Above.

CONTINUED ON PAGE 2, IF CHECKED.

CONDITIONS

- Radioactive material shall be stored at the facility of SIE, Inc. 7450 Winscott Road, Fort Worth, Texas and shall be used at temporary job sites throughout Texas.
- The licensee shall comply with the provisions of Parts 11, 21, 22 and 41 of the Texas Regulations for Control of Radiation.
- Radioactive material shall be used by, or under the supervision of, individuals designated by Marshall B. Broome. These individuals shall have completed the licensee's training program and a minimum of two weeks on-the-job training with radioactive materials.



TEXAS DEPARTMENT OF HEALTH
RADIOACTIVE MATERIAL LICENSE

Supplementary Sheet

LICENSE NUMBER	AMENDMENT NUMBER
5-1944	20

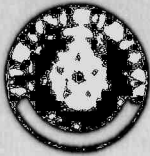
Radio-isotope	6. Form of Material	7. Maximum Activity	8. Authorized Use
. Ra-226	D. Sealed Sources	D. No single source to exceed 25 μ Ci. Total not to exceed 1 mCi.	D. Logging tool calibration sources.
. Am-241	E. Sealed Sources (Mylar Discs)	E. 5 sources of 10 μ Ci. ea. Total: 50 μ Ci.	E. Instrument calibration sources.

2. The individual designated to perform the functions of Radiation Safety Officer for activities covered by this license is Marshall B. Broome.
3. Sealed sources containing radioactive material shall not be opened.
4. Sealed sources of radioactive material, Nickel 63 foil, and/or plated alpha emitting sources shall be tested for leakage and/or contamination in accordance with the provision of Section 11.7(c) of the Texas Regulations for Control of Radiation.
5. Each source holder and logging tool containing radioactive material shall bear a legible and visible marking showing the conventional radiation symbol and the following wording: **DANGER - RADIOACTIVE - DO NOT HANDLE - NOTIFY CIVIL AUTHORITIES**
6. Except as specifically provided otherwise by this license, the licensee shall possess and use the radioactive material authorized by this license in accordance with statements, representations, and procedures contained in application dated June 6, 1974 the licensee's Radiation Safety and Training Manuals, and all correspondence amending the application which results in an amendment to the license.

FOR THE TEXAS DEPARTMENT OF HEALTH

Joseph E. Howell
Chief of Licensing
Radiation Control Branch

Date SEP 27 1979



TEXAS DEPARTMENT OF HEALTH
RADIOACTIVE MATERIAL LICENSE

Supplementary Sheet

LICENSE NUMBER	AMENDMENT NUMBER
5-1944	21

Geo-Log, Inc.
ATTN: M. B. Broome
193 Industrial Blvd.
McKinney, Texas 75069

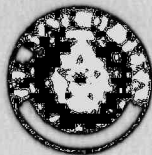
In accordance with letters dated October 1, 1980 and December 8, 1980, signed by Marshall B. Broome, License No. 5-1944 is hereby amended as follows:

To change Parts A and C of Items 5, 6, 7 and 8 to read:

5. Radio-isotope	6. Form of Material	7. Maximum Activity	8. Authorized Use
A. Am-241	A. Sealed Sources (NSSI Model AN-HP or GN Model 71-1)	A. 20 sources of 1 Ci. ea.	A. Well logging for mineral exploration.
C. Cs-137	C. Sealed Sources (GN Model VD-HP)	C. 20 sources of 125 mCi.	C. Well Logging for mineral exploration.

To add Part F to Items 5, 6, 7 and 8 to read:

5. Radio-isotope	6. Form of Material	7. Maximum Activity	8. Authorized Use
F. Cs-137	F. Sealed Source (GN Model CSV)	F. 1 source of 1 Ci.	F. Calibration of survey meters in Gulf Nuclear Model IC-51 Calibrator.



TEXAS DEPARTMENT OF HEALTH
RADIOACTIVE MATERIAL LICENSE

Supplementary Sheet

LICENSE NUMBER	AMENDMENT NUMBER
5-1944	21

CONTINUED FROM PAGE 1

To add Condition 17 to read:

17. Calibration of Geo-Log, Inc. Survey meters shall be done by, or under the supervision of, Marshall B. Broome, using procedures outlined in the letters dated October 1, 1980 and December 8, 1980.

To add Condition 18 to read:

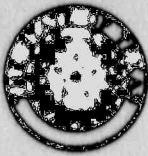
18. Radiation survey instruments shall be calibrated at intervals not to exceed 6 months.

FOR THE TEXAS DEPARTMENT OF HEALTH

JAN 08 1981

Date _____

Joseph E. Howell
 Chief of Licensing
 Radiation Control Branch



TEXAS DEPARTMENT OF HEALTH
RADIOACTIVE MATERIAL LICENSE

Supplementary Sheet

LICENSE NUMBER	AMENDMENT NUMBER
5-1944	22

Geo-Log, Inc.
ATTN: M. B. Moore
193 Industrial Blvd.
McKinney, Texas 75069

In order to correct an error of omission, License No. 5-1944 is hereby amended as follows:

To change Item 4, the expiration date, from July 31, 1980 to July 31, 1983.

JAN 14 1981

Date _____

FOR THE TEXAS DEPARTMENT OF HEALTH

Joseph E. Bonell

Chief of Licensing
Radiation Control Branch



TEXAS DEPARTMENT OF HEALTH
RADIOACTIVE MATERIAL LICENSE

Supplementary Sheet

LICENSE NUMBER	AMENDMENT NUMBER
5-1944	23

Geo-Log, Inc.
ATTN: M. B. Broome
193 Industrial Boulevard
McKinney, Texas 75069

In accordance with letter dated January 29, 1981, signed by Marshall B. Broome, License No. 5-1944 is hereby amended as follows:

To add Part G to Items 5, 6, 7 and 8 to read:

- | | | | |
|------------------|--|---|--|
| 5. Radio-isotope | 6. Form of Material | 7. Maximum Activity | 8. Authorized Use |
| G. Ir-192 | G. Sealed Sources
(Gulf Nuclear Model VL-1) | G. 5 sources of 100 mCi. ea.
Total: 500 mCi. | G. Density well logging for mineral exploration. |

JAN 30 1981

Date _____

FOR THE TEXAS DEPARTMENT OF HEALTH

Chief of Licensing
Radiation Control Branch

Joseph E. Howell

Geo-Log, Inc.
ATTN: Floyd H. Moore, Jr.
Vice President/RSO
205 Industrial Blvd.
Granbury, TX 76048

MAY 10 1988

Docket No. 030-12963
License No. 42-17558-01
Control No. 461867

Gentlemen:

This is to acknowledge receipt of your application for renewal of the byproduct material license identified above. Your application is deemed timely filed, and accordingly, the license will not expire until final action has been taken by this office.

Any correspondence regarding the renewal application should reference the control number specified and your license number.

Sincerely,

Original signed by
J. A. Marshall

Charles L. Cain, Chief
Nuclear Materials Licensing Section

RIV:NMLS *JAM*
JAMarshall;ap
5/4/88

C:NMLS *JAC*
JACain
5/4/88