

FORM NRC-313 I (6-76) 50 CFR 30		U.S. NUCLEAR REGULATORY COMMISSION		1. APPLICATION FOR: (Check and/or complete as appropriate)	
<b>APPLICATION FOR BYPRODUCT MATERIAL LICENSE INDUSTRIAL</b>				<input checked="" type="checkbox"/>	a. NEW LICENSE
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 a licensee 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.				<input type="checkbox"/>	b. AMENDMENT TO: LICENSE NUMBER
				<input type="checkbox"/>	c. RENEWAL OF: LICENSE NUMBER
2. APPLICANT'S NAME (Institution, firm, person, etc.) U.S. Geological Survey, WRD Montana District			3. NAME OF PERSON TO BE CONTACTED REGARDING THIS APPLICATION Arnold J. Boettcher <i>Joe A. Moreland</i>		
TELEPHONE NUMBER AREA CODE NUMBER EXTENSION 406-449-5263 FTS 585-5263			TELEPHONE NUMBER AREA CODE - NUMBER EXTENSION 406-449-5263 FTS 585-5263		
4. APPLICANT'S MAILING ADDRESS (Include Zip Code) Federal Building Drawer 10076 Helena, Montana <i>59601</i>			5. STREET ADDRESS WHERE LICENSED MATERIAL WILL BE USED (Include Zip Code) Temporary job sites of the USGS in Montana.		
(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. <i>Michael R. Cannon</i> Arnold J. Boettcher			Hydrologist		
b. Thomas E. Reed			<i>Hydrologic</i> Engineering Technician		
c. <i>Wayne A. Wood</i>			<i>Hydrologic Technician</i>		
7. RADIATION PROTECTION OFFICER Joe A. Moreland ✓			Attach a resume of person's training and experience as outlined in Items 16 and 17 and describe his responsibilities under Item 15.		
B. LICENSED MATERIAL					
LINE NO.	ELEMENT AND MASS NUMBER A	CHEMICAL AND/OR PHYSICAL FORM B	NAME OF MANUFACTURER AND MODEL NUMBER (If Sealed Source) C	MAXIMUM NUMBER OF MILLICURIES AND/OR SEALED SOURCES AND MAXIMUM ACTIVITY PER SOURCE WHICH WILL BE POSSESSED AT ANY ONE TIME D	
(1)	Americium (241)- Berillium	Sealed Source	Nuclear Sources and Services Houston, Texas Model AN-HP	3 curies	
(2)					
(3)					
(4)					
DESCRIBE USE OF LICENSED MATERIAL E					
(1)	To be attached to a neutron probe for geophysical well logging				
(2)	8506120374 850521 REQ4 LIC30				
(3)	25-18269-01 PDR				
(4)					

9. STORAGE OF SEALED SOURCES			
LINE NO.	CONTAINER AND/OR DEVICE IN WHICH EACH SEALED SOURCE WILL BE STORED OR USED. <div style="text-align: center;">A.</div>	NAME OF MANUFACTURER <div style="text-align: center;">B.</div>	MODEL NUMBER <div style="text-align: center;">C.</div>
(1)	DOT, Type 7A-Epoxy-Boron Spherical Container	Nuclear Sources and Services, Inc. Houston, Texas	100-081
(2)			
(3)			
(4)			

  

10. RADIATION DETECTION INSTRUMENTS						
LINE NO.	TYPE OF INSTRUMENT <div style="text-align: center;">A</div>	MANUFACTURER'S NAME <div style="text-align: center;">B</div>	MODEL NUMBER <div style="text-align: center;">C</div>	NUMBER AVAILABLE <div style="text-align: center;">D</div>	RADIATION DETECTED (alpha, beta, gamma, neutron) <div style="text-align: center;">E</div>	SENSITIVITY RANGE (milliroentgens/hour or counts/minute) <div style="text-align: center;">F</div>
(1)	Geiger Tube	Victoreen	493	1 (ordered)	alpha, beta and gamma	0.1-20 mr/hr.
(2)	Geiger Tube	Victoreen	490 THYAC III	1	Beta Gamma	0-20 mr/hr
(3)						
(4)						

  

11. CALIBRATION OF INSTRUMENTS LISTED IN ITEM 10	
<input type="checkbox"/> a. CALIBRATED BY SERVICE COMPANY NAME, ADDRESS, AND FREQUENCY Gulf Nuclear Inc. Box 58866, Houston, Texas Every 6 months	<input type="checkbox"/> b. CALIBRATED BY APPLICANT Attach a separate sheet describing method, frequency and standards used for calibrating instruments.

  

12. PERSONNEL MONITORING DEVICES		
TYPE (Check and/or complete as appropriate.) <div style="text-align: center;">A</div>	SUPPLIER (Service Company) <div style="text-align: center;">B</div>	EXCHANGE FREQUENCY <div style="text-align: center;">C</div>
<input checked="" type="checkbox"/> (1) FILM BADGE  <input type="checkbox"/> (2) THERMOLUMINESCENCE DOSIMETER (TLD)  <input type="checkbox"/> (3) OTHER (Specify): _____   	Radiation Detection Company	<input checked="" type="checkbox"/> MONTHLY  <input type="checkbox"/> QUARTERLY  <input type="checkbox"/> OTHER (Specify): _____   

  

13. FACILITIES AND EQUIPMENT (Check where appropriate and attach annotated sketch(es) and description(s).)
<input type="checkbox"/> a. LABORATORY FACILITIES, PLANT FACILITIES, FUME HOODS (Include filtration, if any), ETC. <input checked="" type="checkbox"/> b. STORAGE FACILITIES, CONTAINERS, SPECIAL SHIELDING (fixed and/or temporary), ETC. <input type="checkbox"/> c. REMOTE HANDLING TOOLS OR EQUIPMENT, ETC. <input type="checkbox"/> d. RESPIRATORY PROTECTIVE EQUIPMENT, ETC.

  

14. WASTE DISPOSAL
a. NAME OF COMMERCIAL WASTE DISPOSAL SERVICE EMPLOYED Not applicable
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.  No wastes will be disposed.

# INFORMATION REQUIRED FOR ITEMS 15, 16 AND 17

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

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

## 18. CERTIFICATE

(This item must be completed by applicant)

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

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

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

b. CERTIFYING OFFICIAL (Signature)

c. NAME (Type or print)

R. Gale McMurtrey

(1) LICENSE FEE CATEGORY:

d. TITLE

Acting District Chief

(2) LICENSE FEE ENCLOSED: \$

e. DATE

September 1, 1978



U. S. NUCLEAR REGULATORY COMMISSION  
MATERIALS LICENSEPage 1 of 3 Pages

This Copy Is For Your Files

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 30, 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. Department of the Interior U. S. Geological Survey Water Resources Division		3. License number 25-18269-01
2. Montana District Federal Building, Drawer 10076 Helena, Montana 59601 57626		4. Expiration date September 30, 1983
		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 source (Nuclear Source and Services Model AN-HP)	A. 1 source of 3 curies
9. Authorized use		
A. To be used for well logging.		

## CONDITIONS

10. Licensed material shall be used only at the licensee's facilities located in Helena, Montana and at temporary job sites of the licensee anywhere in the United States.
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, *Michael R. Cannon,* Arnold J. Boettcher, Thomas E. Reed, or Joe A. Moreland.  
*Wayne A. Wood*

U.S. GEOLOGICAL SURVEY  
MONTANA DISTRICT  
GEOPHYSICAL BOREHOLE LOGGING  
RADIATION SAFETY MANUAL  
1978

PART A

1. Radiation Program Management and Responsibility

- a. The Radiation Protection Officer is to be designated overall manager for the radiation program.
- b. The duties of the Radiation Protection Officer include the delegation of authority to persons responsible for carrying out the duties such as that of Radiation Safety Officer, overall responsibility for records, surveys, the forming of committees where necessary and, in general, the administrative procedures for the entire radiation program. The Radiation Protection Officer is Joe Moreland.

2. The Radiation Safety Officer is responsible to the Radiation Protection Officer and in general is to conduct or cause to be conducted the programs and responsibility delegated by the Radiation Protection Officer. These duties might include:

- a. Site surveys
- b. Records, personnel monitoring records and compilation
- c. Vehicle survey records
- d. Training and qualifying personnel
- e. Conducts periodic safety checks to assure the adequacy of the radiation protection program

The Radiation Safety Officer is Joe Moreland -  
~~Arnold L. Hatcher.~~

3. A. J. Boettcher - -01399-08-  
E. O. Ray, 350 on License No. 05-1399-08, U.S. Geological Survey  
Denver Federal Center, will be used as a Consultant.

## e. Leak Test Procedures

Wipe tests on all sources must be performed at intervals not exceeding 6 months.

Source will be wipe tested with Gulf Nuclear, Inc. Model LTK-1 Leak Test Kit. (Procedures enclosed.)

*evaluated by U.S.G.S.*  
Leak test kits will be ~~mailed to Gulf Nuclear at Houston, Texas, for counting.~~

*Denver, Colorado*

Reports will be sent back to licensee with leak test certificate

## f. Procedure for Lost Source Downhole

- (1) When a source is lost, notify the well owner or his representative that a source is stuck in the well. As soon thereafter as possible, hand him a drawing of the source and housing model. This will enable him to know before he starts the fishing operation, the quantity, type of radioactive material, and the mechanical construction of the capsule and tool involved.

Notify the State Radiation Control Agency involved and the NRC that the source has been lost and keep them informed of the progress toward recovery of the source.

- (2) Dosimeters or film badges will be furnished to all personnel involved in the source recovery. The personnel will be advised that these are for their protection and intended primarily for a record of trivial or no exposures to his employees.