



DEPARTMENT OF THE ARMY  
OFFICE OF THE SURGEON GENERAL  
WASHINGTON 25, D. C.

IN REPLY REFER TO  
MEDDE-CH

22 April 1958

Isotopes Branch  
Division of Licensing and Regulation  
U. S. Atomic Energy Commission  
1717 H Street, N. W.  
Washington 25, D. C.

Attention: Mr. J. R. Mason

Gentlemen:

Recommend approval of inclosed application for Byproduct  
Material License for Diamond Ordnance Fuze Laboratories, Laboratory 50,  
Washington 25, D. C., for 10 millicuries of Carbon 14.

The radioisotope facilities of Diamond Ordnance Fuze Laboratories,  
Washington 25, D. C. have been surveyed by personnel of the U. S. Army  
Environmental Health Laboratory and the health protection measures  
have been found to be adequate.

Sincerely,

ARTHUR P. LONG  
Colonel, MC  
Chief, Preventive Medicine Division

1 Incl  
Form AEG-313

Copy furnished:  
Diamond Ordnance Fuze  
Laboratories, Washington, D.C.

8-2534-5

Form AEC-318  
(9-55)

ATOMIC ENERGY COMMISSION  
APPLICATION FOR BYPRODUCT MATERIAL LICENSE

Form approved.  
Budget Bureau No. 38-R027.2.

INSTRUCTIONS: Complete Items 1 through 19 if this is a new application. If renewal is requested, complete only Items 1 through 11 provided that with respect to the other items there has been no change in the information previously submitted. Mail two copies to: U. S. Atomic Energy Commission, P. O. Box E, Oak Ridge, Tennessee, Attention: Isotopes Extension, Division of Civilian Application. Upon approval of this application, the applicant will receive an AEC Byproduct Material License. General requirements for issuance of an AEC Byproduct Material License are contained in Title 10, Code of Federal Regulations, Part 30.

1. (a) NAME AND SHIPPING ADDRESS OF APPLICANT  
(Institution, firm, hospital, person, etc.)  
Diamond Ordnance Fuze Laboratories  
Washington 25, D. C.

(b) ADDRESS(ES) AT WHICH BYPRODUCT MATERIAL WILL BE USED  
(If different from shipping address)  
Same

2. DEPARTMENT TO USE BYPRODUCT MATERIAL  
Laboratory 50

3. INDIVIDUAL USER (Name and title of individual(s) who will use or directly supervise use of byproduct material)  
Edward R. Nelson, Organic Chemist

4. RADIOLOGICAL SAFETY OFFICER (Name of person qualified in radiological safety, if other than individual user)  
A. Schwebel, Health Physicist, NBS

5. PREVIOUS LICENSE OR AUTHORIZATION NUMBER (If this is an application for renewal of a license for byproduct material obtained under a prior license or authorization for radioisotope procurement)

BYPRODUCT MATERIAL OR IRRADIATION SERVICE DESIRED

6. BYPRODUCT MATERIAL (Element and mass number)  
Carbon 14

7. CHEMICAL AND/OR PHYSICAL FORM (Or catalog number)  
Solid BaC<sub>2</sub>  
Nuclear, Chicago

8. MAXIMUM AMOUNT OF RADIOACTIVITY IN MILLICURIES THAT YOU WILL POSSESS AT ANY ONE TIME  
10

9. IF IRRADIATION SERVICE IS DESIRED, STATE PERTINENT DETAILS SUCH AS: CHEMICAL COMPOSITION AND WEIGHT IN GRAMS OF TARGET MATERIAL, RADIOACTIVITY, IRRADIATION TIME IN DAYS, AND NEUTRON FLUX

STATEMENT OF USE

10. (a) DESCRIBE PURPOSE FOR WHICH BYPRODUCT MATERIAL WILL BE USED. (If material is for "human use" complete Supplement A in lieu of this item. If material is to be used in or manufactured as a "sealed source" complete Supplement B in addition to this item.)

An investigation of the possibility of rapid and accurate means of determining diffusion coefficient of water vapor thru polymer film. It is proposed to sweep a dry counting gas by one side of a polymer film whose other side would be in contact with a gas at known and constant humidity. The counting gas now containing traces of water would pass thru labeled BaC<sub>2</sub> generating label acetylene which could be measured by means of a thin window Geiger Muller counter.

(b) DESCRIBE PROCEDURES WHICH WILL BE OBSERVED TO MINIMIZE HAZARD FROM HANDLING, STORAGE, AND DISPOSAL OF THE BYPRODUCT MATERIAL  
A glass vacuum system for all operations is to be set up in a large hood exhausting outside the room in a chimney above the roof. A thin window counter is to be operating in this hood at all times and the front of the hood will have polymethylmethacrylate doors with gaskets on them. Thus any time the system will be in use the blower will be on and the hood will be closed tight at other times. The acetylene generated after counting is to be exhausted into the stream of another blower and exhausted outdoors.

CERTIFICATE

11. The applicant and any official executing this certificate on behalf of the applicant named in Item 1, certify that this application is prepared in conformity with Title 10, Code of Federal Regulations, Part 30, and do solemnly swear (or affirm) that all information contained herein, including any supplements attached hereto, is true and correct to the best of our knowledge and belief.

State of Washington, D. C.  
County of \_\_\_\_\_  
Subscribed and sworn to before me this 15th  
day of April 1958

Diamond Ordnance Fuze Laboratories  
Applicant named in Item 1  
By W. J. Hummer  
Technical Director  
Title of Certifying Official

Cudley R. Hawkins  
Notary Public

1958 15 April 1958  
Date

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.

**ATOMIC ENERGY COMMISSION  
APPLICATION FOR BYPRODUCT MATERIAL LICENSE**

INSTRUCTIONS: Complete Items 12 through 19 if this is a new application. This information may be omitted from subsequent applications provided there is no change in the information previously submitted, and reference is made in Item 5 to the application on which this information appears.

**TRAINING AND EXPERIENCE WITH RADIOACTIVITY OF INDIVIDUAL USER NAMED IN ITEM 3**

12. TYPE OF TRAINING	WHERE TRAINED	DURATION OF TRAINING	ON THE JOB (Circle answer)		FORMAL COURSE (Circle answer)	
			Yes	No	Yes	No
1. Principles and practices of radiological health safety. . . . .			Yes	No	Yes	No
2. Radioactivity measurement standardization and monitoring techniques and instruments . . . . .	This person was given pertinent information by informal discussion with NBS Experts		Yes	No	Yes	No
3. Mathematics and calculations basic to the use and measurement of radioactivity. . . . .			Yes	No	Yes	No
4. Biological effects of radiation. . .			Yes	No	Yes	No
5. Actual use of radioisotopes in the types and quantities for which application is being made, or equivalent experience . . . . .			Yes	No	Yes	No

**13. ISOTOPE HANDLING EXPERIENCE**

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
Carbon 14	10 mc	See Above	Informal training received	See Item 10

14. If Radiological Safety Officer named in Item 4 is different from individual user named in Item 3, use supplementary sheet to provide equivalent information on "Training and Experience With Radioactivity of Radiological Safety Officer." Supplementary sheet is attached (Circle answer) Supple-  
Yes No

**PHYSICAL FACILITIES, EQUIPMENT, AND RADIATION INSTRUMENTATION**

**15. RADIATION DETECTION INSTRUMENTS (Use separate sheet if necessary)**

TYPE OF INSTRUMENTS (Include make and model number of each)	NUMBER AVAILABLE	RADIATION DETECTED	SENSITIVITY RANGE (mr/hr)	WINDOW THICKNESS (mg/cm <sup>2</sup> )	USE (Monitoring, surveying, measuring)
Thin window Geiger-Muller counter	See covering letter,		9 April 1957		Measuring

**16. FILM BADGES, DOSIMETERS, AND OTHER PERSONNEL MONITORING DEVICES INCLUDING BIO-ASSAY PROCEDURES**

Available but unnecessary See covering letter, 9 April 1957

**17. METHOD, FREQUENCY, AND STANDARDS USED IN CALIBRATING INSTRUMENTS LISTED ABOVE (For film badges specify method of calibration and processing, or name supplier)**

See covering letter, 9 April 1957

**18. (a) DESCRIBE BRIEFLY REMOTE HANDLING EQUIPMENT, STORAGE CONTAINERS, SHIELDING, AND LABORATORY FACILITIES (Working areas, fume hoods, etc.)**

Covered in paragraph 10

(b) SKETCHES OF SUCH FACILITIES ARE ATTACHED (Circle answer)

Yes  No

**19. DESCRIBE BRIEFLY RADIATION SURVEYING PROCEDURES AND METHODS OF DISPOSING OF RADIOACTIVE WASTES**

Disposal service will be provided by NBS