Form AEC-313
(5-58)

ATOMIC ENERGY COMMISSION

APPLICATION FOR BYPRODUCT MATERIAL LICENSE

Form approved.
Budget Bureau No. 38-R027.4.

INSTRUCTIONS.--Complete Items 1 through 16 if this is an initial application. If application is for renewal of a license, complete only Items 1 through 7 and indicate new information or changes in the program as requested in Items 8 through 15. Use supplemental sheets where necessary. Item 16 must be completed on all applications. Mail three copies to: U. S. Atomic Energy Commission, Washington 25, D. C. Attention: Isotopes Branch, Division of Licensing and Regulation. Upon approval of this application, the applicant will receive an AEC Byproduct Material License. An AEC Byproduct Material License is issued in accordance with the general requirements contained in Title 10, Code of Federal Regulations, Part 30 and the Licensee is subject to Title 10, Code of Federal Regulations, Part 20.

1. (a) NAME AND STREET ADDRESS OF APPLICANT. *(Institution, firm, hospital, person, etc.)*

Department of the Army, Fitzsimons General Hospital and U. S. Army Medical Research and Nutrition Laboratory
Derver, Colorado

(b) STREET ADDRESS(ES) AT WHICH BYPRODUCT MATERIAL WILL BE USED. *(If different from 1 (a).)*

Summit of Pikes Peak, Colorado

2. DEPARTMENT TO USE BYPRODUCT MATERIAL

U.S. Army Medical Research and Nutrition Laboratory, Fitzsimons General Hospital, Denver, Colorado

3. PREVIOUS LICENSE NUMBER(S). *(If this is an application for renewal of a license, please indicate and give number.)*

License No. 5-46-13 (A66)

4. INDIVIDUAL USER(S). *(Name and title of individual(s) who will use or directly supervise use of byproduct material. Give training and experience in Items 8 and 9.)*

As specified in License No. 5-46-13(A66) condition 12

5. RADIATION PROTECTION OFFICER *(Name of person designated as radiation protection officer if other than individual user. Attach resume of his training and experience as in Items 8 and 9.)*

As specified in application (dtd Dec 6, '63) for License No. 5-46-13(A66)

6. (a) BYPRODUCT MATERIAL *(Elements and mass number of each.)*	(b) CHEMICAL AND/OR PHYSICAL FORM AND MAXIMUM NUMBER OF MILLICURIES OF EACH CHEMICAL AND/OR PHYSICAL FORM THAT YOU WILL POSSESS AT ANY ONE TIME. *(If sealed source(s), also state name of manufacturer, model number, number of sources and maximum activity per source.)*	
A. Iodide-131	A. Iodide	A. 0.5 mc
B. Iodide-125	B. Iodide	B. 0.5 mc

7. DESCRIBE PURPOSE FOR WHICH BYPRODUCT MATERIAL WILL BE USED. *(If byproduct material is for "human use," supplement A (Form AEC-313a) must be completed in lieu of this item. If byproduct material is in the form of a sealed source, include the make and model number of the storage container and/or device in which the source will be stored and/or used.)*

See attached Appendix 1.

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(Continued on reverse side)

Form AEC-313 (5-58)

TRAINING AND EXPERIENCE OF EACH INDIVIDUAL NAMED IN ITEM 4 *(Use supplemental sheets if necessary)*

8. TYPE OF TRAINING	WHERE TRAINED	DURATION OF TRAINING	ON THE JOB (Circle answer)	FORMAL COURSE (Circle answer)
a. Principles and practices of radiation protection	NA		Yes No	Yes No
b. Radioactivity measurement standardization and monitoring techniques and instruments	NA		Yes No	Yes No
c. Mathematics and calculations basic to the use and measurement of radioactivity	NA		Yes No	Yes No
d. Biological effects of radiation	NA		Yes No	Yes No

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

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

10. RADIATION DETECTION INSTRUMENTS *(Use supplemental sheets if necessary.)*

TYPE OF INSTRUMENTS (Include make and model number of each)	NUMBER AVAILABLE	RADIATION DETECTED	SENSITIVITY RANGE (mr/hr)	WINDOW THICKNESS (mg/cm²)	USE (Monitoring, surveying, measuring)
As specified in Application (dtd 6 Dec '63) for License No. 5-46-13 (A66)					

11. METHOD, FREQUENCY, AND STANDARDS USED IN CALIBRATING INSTRUMENTS LISTED ABOVE.

As specified in Application (dtd 6 Dec 63) for License No. 5-46-13 (A66)

12. FILM BADGES, DOSIMETERS, AND BIO-ASSAY PROCEDURES USED. *(For film badges, specify method of calibrating and processing, or name of supplier.)*

As specified in Application (dtd 6 Dec 63) for License No. 5-46-13 (A66)

INFORMATION TO BE SUBMITTED ON ADDITIONAL SHEETS

13. FACILITIES AND EQUIPMENT. Describe laboratory facilities and remote handling equipment, storage containers, shielding, fume hoods, etc. Explanatory sketch of facility is attached. (Circle answer) Yes No

As specified in Application (dtd 6 Dec 63) for license No. 5-46-13(A66)also see appendix 1

14. RADIATION PROTECTION PROGRAM. Describe the radiation protection program including control measures. If application covers sealed sources, submit leak testing procedures where applicable, name, training, and experience of person to perform leak tests, and arrangements for performing initial radiation survey, servicing, maintenance and repair of the source.

As specified in Application (dtd 6 Dec 63) for license No. 5-46-13(A66)also see appendix 1

15. WASTE DISPOSAL. If a commercial waste disposal service is employed, specify name of company. Otherwise, submit detailed description of methods which will be used for disposing of radioactive wastes and estimates of the type and amount of activity involved.

As specified in Application (dtd 6 Dec 63) for license No. 5-46-13(A66)also see appendix 1

CERTIFICATE (This item must be completed by applicant)

16. 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 THAT ALL INFORMATION CONTAINED HEREIN, INCLUDING ANY SUPPLEMENTS ATTACHED HERETO, IS TRUE AND CORRECT TO THE BEST OF OUR KNOWLEDGE AND BELIEF.

Dept of Army, FGH, & USA Med Rsch & Nutr Lab, Denver, Colo

Applicant named in item 1

Date 12 August 1964

By: Edwin L. Overholt

Edwin L. Overholt, Col MC
Chairman, Radioisotope Committee

Title of certifying official

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.

* U.S. GOVERNMENT PRINTING OFFICE : 1961 O—615963

APPENDIX 1

The summit of Pikes Peak, Colorado (elevation 14,100 feet) is available for research purposes to the U. S. Army Medical Research and Nutrition Laboratory, Fitzsimons General Hospital, Denver, Colorado, from 1 September to 30 October 1964. It is planned to study the biogenesis of thyroxine in rats exposed to these altitudes.

A. Experimental Design: Twenty-five rats subdivided into five groups will be transported from the USA Med Rsch & Nutr Lab to the summit of Pikes Peak, Colorado. At various intervals after arriving at the summit the animals of each group will receive 10 to 20 μc of either I-131 or I-125 by intraperitoneal injection with a calibrated syringe. Preliminary experiments now in progress at the USA Med Rsch & Nutr Lab will determine which of these isotopes will ultimately be used. (Only one isotope will be transported to Pikes Peak.) Twenty-four hours after receiving the isotope the animals will be sacrificed by exsanguination through the abdominal aorta and the thyroid gland will be removed and frozen. All further experimentation, e.g. hydrolysis, chromatography, etc. will be performed at the USA Med Rsch & Nutr Lab in Denver. Appropriate control studies will also be carried out in Denver.

B. Facilities at the Summit of Pikes Peak: The summit is reached by road or cog railway both of which are open only to members of this Laboratory during the above stated time. At the summit there are two buildings, 55' x 110' and 20' x 30', which have excellent heat, water, sewage, and electricity. A small area of one of these buildings will be isolated and used only for these studies. The isotope will be shielded with lead bricks as specified in License No. 5-46-13 (A66).

C. Transportation: All materials will be transported together with the investigators by automobile. The first half of this 2-1/2 hour trip is on a four lane dual highway from Denver to Colorado Springs. The remainder of the trip is on the toll road to Pikes Peak which is open only to members of this Laboratory during the stated time. There will be no traveling through any heavily populated area. The isotope will be transported in a sealed plastic container which in turn will be sealed in a 1/2" lead container. Unused portions of the isotope will be returned to the Laboratory in the same fashion at the conclusion

of the study. All radioactive samples from the animals, i.e. thyroids, blood, urine, and feces, and carcasses will be transported to the Laboratory by automobile in lead containers, the thickness of which will be appropriate for the amount of radioactivity in the various specimens. All transportation of the isotope or specimens to or from the summit of Pikes Peak will be monitored by a portable Nuclear-Chicago Surveymeter (Model 2612) which has been calibrated as specified in Application for License No. 5-46-13 (A66).

D. Waste Products: The animals will be maintained in metabolic cages so that urine and feces may be collected. Urine, feces, and carcasses will be returned to the USA Med Rsch & Nutr Lab in the manner stated above. Other materials, such as syringes, pipettes, dissecting tools, needles, etc. will be returned to the main Laboratory in Denver for disposal or decontamination as specified in Application for License No. 5-46-13 (A66). There will be no disposal of radioactivity or decontamination of any equipment at the summit of Pikes Peak.

E. Monitoring: Aside from the monitoring during transportation of isotopes and specimens as stated above (see C. Transportation) the experimental area on the summit of Pikes Peak will be continuously monitored by a Nuclear Chicago thin mica end-window detector attached to a rate meter (Labitron, Nuclear Chicago, Model 1619A) which in turn will be attached to a rectilinear recorder (Texas Instruments).