Form AEC-313 (5-58)	ATOMIC ENERGY O	COMMISSION UCT MATERIAL LICENSE	, · · . · ·
INSTRUCTIONS.—Complete It plete only Items 1 through 7 supplemental sheets where ne Commission, Washington 25, application, the applicant wil accordance with the general re ject to Title 10, Code of Fede	ems 1 through 16 if this is an in and indicate new information o essary. Item 16 must be complet D. C. Attention: Isotopes Bran I receive an AEC Byproduct Mo equirements contained in Title 1 ral Regulations, Part 20.	nitial application. If application is for renewal of a license, com- br changes in the program as requested in Items 8 through 15. Use ted on cli applications. Mail three copies to: U. S. Atomic Energy nch, Division of Licensing and Regulation. Upon approval of this aterial License. An AEC Byproduct Material License is issued in 10, Code of Federal Regulations, Part 30 and the Licensee is sub-	
(a) NAME AND STREET ADDRESS OF	APPLICANT. (Institution, firm, hospital,	(b) STREET ADDRESS(ES) AT WHICH BYPRODUCT MATERIAL WILL BE USED. (IF	1.
Harry Diamond Lab Connecticut Ave. Washington, D. C.	oratories & Van Ness St., N.W. 20438	different from 1 (a).	
		and the second sec	<b>.</b>
DEPARTMENT TO USE BYPRODUCT MA	TERIAL	3. PREVIOUS LICENSE NUMBER(S). (If this is an application for renewal of a license, please indicate and give number.)	1 · · ·
Mechanisms Branch (	450)	Bengual 8-2531-10	
	and the second		1
supervise use of byproduct material. ( 9.)	e of individuality who will use of directly live training and experience in Items 8 and	tection officer if other than individual user. Attach resume of his training and ex- perience as in Items 8 and 9.)	
Ira R. Marcus Duane E. Voeller	···-' · · · · ·	Gerald P. Hanson	
	· · · · · · · · · · · · · · · · · · ·		
. (a) BYPRODUCT MATERIAL. (Elemen and mass number of each.)	5 [b] CHEMICAL AND/OR PHYSICAL ICAL FORM THAT YOU WILL PO number, number of sources and n	FORM AND MAXIMUM NUMBER OF MILLICURIES OF EACH CHEMICAL AND/OR PHYS- SSESS AT ANY ONE TIME. (If sealed source(s), also state name of manufacturer, model naximum activity per source.)	1
	l. Chemical Form	n - Pure Material	
Americium 241 _	2. Deposited or	plated on platinum or monel metal disk.	
· · · · · · · · · · · · · · · · · · ·	3. Quantity - 50	D microcuries.	
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DESCRIBE PURPOSE FOR WHICH BYP pleted in lieu of this item. If byproduc which the source will be stored and/or.	RODUCT MATERIAL WILL BE USED (If ) material is in the form of a sealed source, read.)	byproduct material is for "human use," supplement A (Form AEC-313a) must be com- include the make and model number of the storage container and/or device in	1.
The Americian 217	rill he used as an all	oha particle source for laboratory	.   ·
experiments in the	design and development	nt of a timing mechanism.	
and a second		, M	
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			ACH INDIVIDU	AL NAMED IN ITEN	A 4 (Use supplemental	sheets if necessary	) <u> </u>
<ul> <li>8. TYPE OF TRAINING</li> <li>a. Principles and practices of radiation protection</li> <li>b. Radioactivity measurement standardization and monitoring techniques and instruments.</li> <li>c. Mathematics and calculations basic to the use and measurement of radioactivity.</li> </ul>			WHERE TRAINED See supplemental sheet for change			ON THE JOB (Circle answer)	FORMAL COUR (Circle onswer
		See sup				Yes No	Yes No
						Yes No	Yes No
						Yes No	Yes No
d. Biological effects of radiation	, 1		و و ا		.t.	Yes No	Yeş No
9. EXPERIENCE WITH RADIATION	N. (Actual	use of radioiso	topes or equivale	nt experience.)			
ISOTOPE MAXIMUM AMOUNT	WI	HERE EXPERIENC	E WAS GAINED	DURATION	OF EXPERIENCE	TYPE C	OF USE
	See s	npplemen	tal sheet	for changes	5.		i :
10. RADIATION DETECTION INST	TRUMENTS.	(Use supplem	ental sheets if ne	ecessary.)			· · · _ · _ ·
TYPE OF INSTRUMENTS (include make and model number	of each)		RADIATION DETECTED	SENSITIVITY RANGE (mr/hr)	WINDOW THICKNESS (mg/cm <sup>2</sup> )	(Monitoring, su	USE rveying, measuring
Nuclear Measure	ements	•	· · ·	•			
Corporation PC-	-3A	•	Alpha,		and the second		
Gas Flow Interr	nal	1	Beta,			meas	uring
Proportional Co	ounter	••	Gamma .	÷ ÷			
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# SUPPLEMENTAL SHEET 1

Item 5. (See item 8).

Item 8. Training of Radiation Protection Officer and Users.

		1	Duration of	On the	Formal
Type of Training		Where Trained	Iraining	Job	Course
Ger (R O	ald P. Hanson adiation Protectficer)	ction			
a.	Principles	Univ, of Mich, Argonne Natil Lab	l yr 3 mos	No Xec	Yes
Ъ <b>.</b>	Measurement	Univ. of Mich. Argonne Natil Lab	l yr 3 mos	No	Yes
C.	Mathematics	Flint Jun. Coll. Univ. of Mich.	2 yrs 5 yrs	No	Yes
d.	Biological	Univ. of Mich. Argonne Nat'l Lab	l yr 3 mos	No Yes	Yes No
Ira	R. Marcus				
<b>a.</b>	Principles	Nuclear Instrumenta- tion	Ju mos	No	Voo
Ъ.	Measurement	NBS Grad. School	4 mos	No	Yes
c.	Mathematics	Brooklyn College	4 yrs	No	Yes
d.	Biological	Army CBR Training	l mo	No	Yes
Dua	ne E. Voeller				
a. b.	Principles Neasurement	HDL None	l yr	Yes	No
с.	Mathematics	No. Dakota Sch. of Forestry Iowa State University	7 2 yrs 6 mos	No No	Yes Yes
d.	Biological	George Washington Univ. None	4 mos	No	Yes

Item 9. Experience with Radiation for RPO and Users.

Isotope	Maximum Amount	Where Experience Was Gained	Duration of Experience	Type of <u>Use</u>
Gerald P. Hanson (Radiation Prot Officer) Cobalt-60 Cesium-137 Iodine-131 Misc (3-94)	2,500 c 100 mc 40 mc Various amts (few micro - several hun- dred mc)	Univ. of Michigan Univ. of Michigan Univ. of Michigan Argonne Nat'l Lab	4 mos 1 yr Instru 4 mos 3 mos On tl instru waste contar	Lab Project ument Calibration Field Project he Job training - ument calibration, disposal, de- mination.
	tine si Profession Atoria			51794

### Supplemental Sheet 2

#### Item 9. Experience with Radiation for RPO and Users, Cont'd

In addition, during approximately one and one half years with the Kansas State Board of Health he worked in a supervisory capacity as Supervisor of Radiation Hygiene Services. In this capacity his responsibilities were in the areas of registration of radioactive sources, promulgation of radiation protection regulations, consultation with users of radiation sources and radioactive materials, and co-inspection of licensees with A.E.C. inspectors.

Since February 1962 he has worked as the Health Physicist and Radiation Protection Officer for the Harry Diamond Laboratories.

#### Ira R. Marcus

College Physics laboratory experiments to determine half-life of unknown radioactive sample.

One year at HDL using Am<sup>2</sup>41 and Po<sup>210</sup> to test solid state nuclear particle detectors. Maximum amount: .05 and .02 microcuries respectively.

# Duane E. Voeller

One year at HDL using Am<sup>2</sup>41 and Po<sup>2</sup>10 to test solid state nuclear particle detectors. Maximum amount: .2 and .02 microcuries respectively.

Item 11. Method, Frequency, and Standards Used in Calibrating Instruments.

The instrument is not calibrated in an absolute sense, however its constancy is checked prior to each use by inserting a check source in the counting chamber and observing the number of counts registered during a measured interval of time.

The following sources obtained from the National Bureau of Standards are available.

Radium (D+E) check source, approximately 28,000 counts per minute alpha plus beta, March 23, 1962.

U<sub>3</sub>08 check sources

a. 578 Alpha/min, March 23, 1962
b. 1,739 Alpha/min, March 23, 1962
c. 3,115 Alpha/min, March 23, 1962

Item 13. Facilities and Equipment.

The Americium 241 sources are used in a laboratory area for the development of a timing mechanism. In most cases, only one source will be in use at any given time. When a source is not in use it will be stored in a drawer of a metal bench which has been set aside especially for this use. The drawer is equipped with a combination lock, the combination of which is known only to the users.

## Supplemental Sheet 3

Item 14. Radiation Protection Program.

There is in HDL a Radiation Control Eoard composed of the Radiation Protection Officer, Medical Officer, a representative of the administrative office, and several technical members trained or experienced in the use of radioactive materials. The Chief Health Physicist of the National Bureau of Standards is a consulting member. This Board is responsible for the formulation of rules and procedures necessary to (1) minimize hazards due to ionizing radiation (2) insure compliance with all applicable regulations. The use of the requested material will be under the cognizance of this Board.

Periodically, the Radiation Protection Officer will visit the laboratory area and will consult with the users. Smears will be taken in the area of use and will be counted in the NMC - PC 3A described in Item 10. Since the source will be used for statistical type experimental measurements, any significant deviation in the number of counts observed will be noticed by the users. This will serve as an additional warning device in case of loss of Americium from the disk.

Item 15. Waste Disposal.

Waste disposal will be handled by the U. S. Army Edgewood Arsenal Depot Operations Division - AEC License No. 19-1826-6.