Form AEC-374
(9-55)

U. S. ATOMIC ENERGY COMMISSION
BYPRODUCT MATERIAL LICENS

Pursuant to the Atomic Energy Act of 1954 and Title 10, Code of Federal Regulations, Chapter 1, Part 30, Licensing of Byproduct Material, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, own, possess, transfer and import byproduct material listed below; and to use such byproduct material for the purpose (s) and at the place (s) designated below. This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, and is subject to all applicable rules, regulations, and orders of the Atomic Energy Commission now or hereafter in effect and to any conditions specified below.

Licensee	
1. Name **University of Idaho** **College of Forestry**	3. License number **11-100-1**
2. Address **Forest Management Research Dept.** **Moscow, Idaho**	4. Expiration date **March 31, 1958**
Attn: William K. Ferrell and **Frederic D. Johnson**	5. Reference No.

6. Byproduct material (element and mass number)	7. Chemical and/or physical form	8. Maximum amount of radioactivity which licensee may possess at any one time
Calcium 45	**Any**	**50 millicuries**
Phosphorus 32	**Any**	**100 millicuries**

9. Authorized use

Field and laboratory plant studies.

CONDITIONS

10. Unless otherwise specified, the authorized place of use is the licensee's address stated in Item 2 above; **and the materials are to be used by, or under the supervision of, the individuals named above.**

11. Except as hereinafter provided the licensee shall comply with provisions of the Atomic Energy Commission's proposed standards for protection against radiation as published in the Federal Register, July 16, 1955 (10-CFR-20), until such time as said proposed regulations or revisions thereof become effective regulations of the Commission. Notwithstanding, Section 20.24(f) of said standards, labeling shall not be required for laboratory containers such as beakers, flasks and test tubes, used transiently in laboratory procedures during presence of the user.

For the U. S. Atomic Energy Commission

ORIGINAL SIGNED BY
LESTER R. ROGERS

Date **March 21, 1956**

by _____

for: Director, Isotopes Extension
Division of Civilian Application
Oak Ridge, Tennessee

B.P./ HC/mb - CRB

A11

RADIOISOTOPE SHIPPING DOCUMENT

85750

OAK RIDGE NATIONAL LABORATORY

OPERATED FOR U. S. ATOMIC ENERGY COMMISSION
BY CARBIDE AND CARBON CHEMICALS COMPANY
A DIVISION OF
UNION CARBIDE AND CARBON CORPORATION
OAK RIDGE, TENNESSEE

RADIOISOTOPE ORDER NO. 1007-86

RAIL EXPRESS 7-19-56

CUSTOMER'S ORDER NO.	RADIOISOTOPE ORDER NO.	APPROVAL NO.	SCHEDULED DATE
8298	1007-86	11-100-1	7-19-56

SHIP TO

UNIVERSITY OF IDAHO
SPECIAL RESEARCH PROJECT NO. ~~M~~ 11-B
COLLEGE OF FORESTRY
ROOM 112
MOSCOW, IDAHO

BILL TO (IF DIFFERENT FROM SHIP TO)

UNIVERSITY OF IDAHO
SPECIAL RESEARCH PROJECT NO. 11-B
COLLEGE OF FORESTRY
~~MOSCOW~~ MOSCOW, IDAHO

ROUTE AND SHIPPING INSTRUCTIONS

RAIL EXPRESS

CONTAINER NO. ~~NR~~

BILLING INSTRUCTIONS

DESCRIPTION OF MATERIAL ORDERED — **SPECIFIC ACTIVITY REQUESTED**

DATE SHIPPED 7-19-56

BOX WEIGHT 1#

ORDERED	SHIPPED	DESCRIPTION	UNIT PRICE	EXTENSIONS	HANDLING CHARGE	CONTAINER CHARGE	TOTAL VALUATION
15 MCS	15 mc.	CA 45 (P-1)	2.00	30.00	10.00		40.00

CHEMICAL FORM	BATCH NO.	CONCENTRATION	VOLUME	SPECIFIC ACTIVITY
CaCl₂ in HCl Solution	104	0.837 ± 10% mc/ml	18.0 ml	9.09 mc/g

ANALYSIS

Assayed at 8:00 A. M. 7-19-56

PPT at pH 7 _____

I 133 _____ %

Heavy Metals < 10 p.p.m.

Total Solids _____ mg/ml

Non Volatile Materials _____ mg/ml

Alpha _____ c/min/mt

Radiochemical Purity _____ %

Acidity 1.32 N. Acid

Ca 92.0 mg/ml

CUSTOMER CODE	3010 ~~8298~~	SALE CODE	1 1
CUSTOMER TYPE	7	MATERIAL TYPE	3661-61-2

APPROVED FOR SHIPMENT

SHIPPED BY _____
RADIOISOTOPE SHIPPING DEPARTMENT

SIGNED _____
RADIOISOTOPE SALES DEPARTMENT

4

IN REPLY REFER TO:
IEB:NB

Oak Ridge, Tennessee
April 4, 1956

11-100-1

Mr. Frederic D. Johnson
School of Forestry
University of Idaho
Moscow, Idaho

Subject: DISTRIBUTION OF FORM AEC-391

Dear Mr. Johnson:

Reference is made to your letter of March 27. The purchase orders which you enclosed have been forwarded to Oak Ridge National Laboratory.

The Form AEC-391 should be submitted in duplicate to the Commission facility from whom you desire to procure byproduct material. The address on both the Form AEC-391 and on the purchase order should be:

Oak Ridge National Laboratory
Radioisotope Sales Department
P.O. Box P
Oak Ridge, Tennessee
Attn: Mr. John H. Gillette

In order to facilitate your purchase of byproduct material, we suggest that you send both Form AEC-391 and your purchase order directly to the Oak Ridge National Laboratory. We shall be pleased to forward these forms for you when you submit them with an application. However, it will facilitate your purchase if you send the forms directly to the Oak Ridge National Laboratory on all subsequent orders. We hope this satisfactorily answers your questions.

Very truly yours,

Nathan Bassin, Technical Reviewer
Byproduct Licensing Branch
Isotopes Extension
Division of Civilian Application

OFFICE ▶	Isotopes					
SURNAME ▶	NB Bassin:bp					
DATE ▶	4-4-56					

Form AEC-318 (Rev. 9-53) U. S. GOVERNMENT PRINTING OFFICE 16—62761-3

NRB

2692

LR

UNIVERSITY OF IDAHO
SCHOOL OF FORESTRY
MOSCOW, IDAHO

March 27, 1956

Mr. Lester R. Rogers, Chief
Byproducts Licensing Branch
Isotopes Extension
Division of Civilian Application
U. S. Atomic Energy Commission
Oak Ridge, Tennessee

RE: IEB:NB
(Lic 11-100-1)

Dear Mr. Rogers:

Thank you for your letter of March 21. We were pleased to know that we could submit forms AEC 313 and AEC 391 along with our purchase order and thus expedite the ordering of radioisotopes.

Regarding form 391 we have three questions:

1. How many copies of form 391 do you require? — one copy
2. In Item #1 -- what address do you require for ordering by-products from Oak Ridge? — Rambler
3. Whom shall we make the purchase order to?

We are enclosing three copies of form 391 and our purchase order. If it is misaddressed will you please forward it to the proper agency?

Thank you for your cooperation.

Sincerely,

Frederic D. Johnson

Frederic D. Johnson
Radioisotopes Technologist

FJ:ab
Enc. AKMHR

IN REPLY REFER TO:
IEB:NB (LIC 11-100-1)

Oak Ridge, Tennessee
March 21, 1956

Mr. Frederic D. Johnson
School of Forestry
University of Idaho
Moscow, Idaho

Subject: LICENSE NO. 11-100-1

Dear Mr. Johnson:

Enclosed is License No. 11-100-1 issued against your recent request for Calcium 45 and Phosphorus 32.

Although it is not customary procedure, we would be willing to accept your purchase order and Form AEC-391 for subsequent transfer to Oak Ridge National Laboratory for the procurement of byproduct material. You may follow this procedure with any future applications which you may submit. We will fill in the license number on the forms prior to submission to Oak Ridge National Laboratory.

A new catalog was issued by Oak Ridge National Laboratory in January 1956. There have been some changes made in this catalog, and you may obtain a copy of this new catalog, without charge, by requesting it from Mr. John H. Gillette, Radioisotope Sales Department, Oak Ridge National Laboratory, P.O. Box P, Oak Ridge, Tennessee.

Please be assured of our desire to be of assistance in byproduct licensing.

Very truly yours,

for: Lester R. Rogers
Acting Chief, Byproduct Licensing Branch
Isotopes Extension
Division of Civilian Application

Encls.:
1. Form AEC-374
2. Application forms w/instructions & regulations

OFFICE ▶	Isotopes	Isotopes				
SURNAME ▶	Bassin:bp					
DATE ▶	3-21-56	3-21-56				

Form AEC-318 (Rev. 9-53) U. S. GOVERNMENT PRINTING OFFICE 16—62761-3

Form AEC-313

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)
1. Principles and practices of radiological health safety.	O.R.I.N.S.	1 MONTH OAK RIDGE PLUS 6 YEARS ON THE JOB	(Yes) No	(Yes) No
2. Radioactivity measurement standardization and monitoring techniques and instruments	"	"	(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
CA-45	50 MILLICURIES	O.R.I.N.S. AND OWN LABORATORY	6 YEARS	LAB. AND FIELD
P-32	100 "	" " " "	"	" " "

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*) 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/cm²*)	USE (*Monitoring, surveying, measuring*)
SCALER-RCL, MODEL 1 + GEIGER TUBE	1	ALPH, BETA	1-20000 CPM	1.5MG/CM²	MEASURING
SCALER-NIC, MODEL 172	1	GAMMA	"	"	"
COUNT-RATE METER-NIC, MODEL 161-5	1	"	1-50000 CPM	1.2	MONITORING AND SURVEYING -
SCALER-TRACERLAB MODEL 64	1	"	1-20000 CPM	2.0	MEASURING
PORT.COUNTER-NIC MODEL 2611	1	"	0-20MR/HR	1.5	SURVEYING

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

FILM BADGES USED DURING ALL WORK

DOSIMETER-VICTOREEN- RANGE 0-0.2 R FOR GAMMA RAYS

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

ASSAY INSTRUMENTS - CALIBRATED DAILY WITH C-14

MONITORING INSTRUMENTS - CALIBRATED WEEKLY WITH RADIUM SOURCE

FILM BADGES- TRACERLAB

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

LEAD BRICKS AVAILABLE FOR HIGH SOURCES; TRACERLAB REMOTE PIPETTING DEVICE AVAILABLE; SAFE USED FOR STORAGE OF CONCENTRATED SOURCES; PLASTIC AND GLASS SHIELDING FOR BETA SOURCES; TWO KEEWAUNEE HOODS IN USE.

(*b*) SKETCHES OF SUCH FACILITIES ARE ATTACHED (*Circle answer*) Yes (No)

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

ALL POSSIBLE SOURCES OF HIGH LEVEL CONTAMINATION MONITORED AFTER ALL OPERATIONS. OTHER SOURCES OF CONTAMINATION MONITORED AT LEAST DAILY. ALL WASTE MATERIALS STORED IN LOCKED CONCRETE POT OR IN STAINLESS STEEL TRAYS FOR AT LEAST TEN HALF LIVES.

U. S. GOVERNMENT PRINTING OFFICE 16—57264-5

Form AEC-313
(9-55)

A MIC ENERGY COMMISSION

APPLICATION FOR BYPRODUCT MATERIAL LICENSE

Form approved.
Budget Bureau No. 38-R027.3.

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.*)

COLLEGE OF FORESTRY, UNIVERSITY OF IDAHO
MOSCOW, IDAHO

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

-

2. DEPARTMENT TO USE BYPRODUCT MATERIAL

FOREST MANAGEMENT RESEARCH

3. INDIVIDUAL USER (*Name and title of individual(s) who will use or directly supervise use of byproduct material*)

WILLIAM K. FERRELL, ASSISTANT PROFESSOR AND FREDERIC D. JOHNSON, RADIOISOTOPES TECHNOLOGIST

4. RADIOLOGICAL SAFETY OFFICER (*Name of person qualified in radiological safety, if other than individual user*)

SAME AS ITEM 3

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*)

NONE

BYPRODUCT MATERIAL OR IRRADIATION SERVICE DESIRED

6. BYPRODUCT MATERIAL (*Element and mass number*)	7. CHEMICAL AND/OR PHYSICAL FORM (*Or catalog number*)	8. MAXIMUM AMOUNT OF RADIOACTIVITY IN MILLICURIES THAT YOU WILL POSSESS AT ANY ONE TIME
CA-45	CA-45-P-1	50 MILLICURIES
P-32	P-32-P-1	100 MILLICURIES

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

NONE

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.*)

CA-45....GREENHOUSE STUDY OF CALCIUM METABOLISM OF SMALL PINE TREES AND IN FIELD STUDIES USING TREES ON UNIVERSITY PROPERTY WHICH ARE UNDER CONTROLLED ACCESS.

P-32.....STUDY OF THE RELATIVE EFFICIENCY OF PHOSPHORUS UPTAKE IN DISEASED AND HEALTHY MYCORRHIZAL PINE ROOTS. FIELD STUDIES OF A SIMILAR NATURE ON TREES UNDER CONTROLLED ACCESS

(b) DESCRIBE PROCEDURES WHICH WILL BE OBSERVED TO MINIMIZE HAZARD FROM HANDLING, STORAGE, AND DISPOSAL OF THE BYPRODUCT MATERIAL

MATERIALS IN THE LABORATORY ARE HANDLED IN STAINLESS STEEL TRAYS WITH RUBBER GLOVES IN INITIAL DILUTIONS. FIELD USE AND STORAGE INVOLVES CAREFUL POSTING AND MONITORING OF ALL POSSIBLE HAZARD AREAS. DISPOSAL OF MATERIALS IS ACCOMPLISHED BY STORAGE FOR AT LEAST 10 HALF LIVES AND MONITORING FOLLOWED BY DISPOSAL INTO CITY SEWERS IF ACTIVITY IS VERY LOW. CONCENTRATED SOURCES ARE STORED IN A SAFE WHEN NOT IN USE.

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 Idaho
County of Latah
Subscribed and sworn to before me this 12th day of March 1956

College of Forestry, University of Idaho
Applicant named in Item 1

By Wm K Ferrell
Head, Plywood Research
Title of Certifying Official

H. E. SLADE, Notary Public
Latah County, Moscow, Idaho
My Commission Expires 9-20-

March 12 1956
Date

Notary Public

WARNING

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

Decay
Sewer

(*Continued on reverse side*)

16—57264-5

N. B

UNIVERSITY OF IDAHO
SCHOOL OF FORESTRY
MOSCOW, IDAHO

March 9, 1956

2319

Mr. Lester R. Rogers, Chief
Allocations Branch
Isotopes Extension
Division of Civilian Application
U.S.A.E.C.
Oak Ridge, Tennessee

Dear Mr. Rogers:

We received your letter of February 21, advising of the new application procedure for radioisotopes.

We would like to know if it would be possible to submit the application form (AEC-313, revised) the order form (AEC-391) and our purchase order at the same time. This would save several weeks in the procurement of isotopes.

Do all of the former catalog numbers, prices, etc., remain unchanged?

Sincerely,

Frederic D. Johnson

Frederic D. Johnson

FJ:ab