FORM NRC-313 I (1-79) 10 CFR 30

U.S. NUCLEAR REGULATORY COMMISSION

APPLICATION FOR BYPRODUCT MATERIAL LICENSE
INDUSTRIAL

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 applications 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.

1. APPLICATION FOR: *(Check and/or complete as appropriate)*

	a. NEW LICENSE
	b. AMENDMENT TO: LICENSE NUMBER
X	c. RENEWAL OF: LICENSE NUMBER 29-00505-15

2. APPLICANT'S NAME *(Institution, firm, person, etc.)*

Mobil Research & Development Corporation

TELEPHONE NUMBER: AREA CODE – NUMBER EXTENSION
609-737-3000

3. NAME OF PERSON TO BE CONTACTED REGARDING THIS APPLICATION

T. O. Mitchell

TELEPHONE NUMBER: AREA CODE – NUMBER EXTENSION
609-737-3000

4. APPLICANT'S MAILING ADDRESS *(Include Zip Code)*

P. O. Box 1025
Princeton, NJ 08540

5. STREET ADDRESS WHERE LICENSED MATERIAL WILL BE USED *(Include Zip Code)*

Pennington-Rocky Hill Road
Pennington, NJ 08534

(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.	Louis Deane Rollmann	Research Associate
b.		
c.		

JUL 8 1980

July P63 Renewal
Brown

Applicant... 05 214 (3K)
Check No....
Amount/Fee Category...
Type of Fee... AUG 5 1980
Date Check Rec'd... JUL 8 1980
Received By... Brown

7. RADIATION PROTECTION OFFICER

J. R. Meeks

Attach a resume of person's training and experience as outlined in Items 16 and 17 and describe his responsibilities under Item ...

8. 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)	Hydrogen-3	any	N/A	1 curie
(2)	Carbon-14	any	N/A	100 millicuries
(3)				
(4)				

DESCRIBE USE OF LICENSED MATERIAL
E

(1)	Laboratory research
(2)	Laboratory research
(3)	
(4)	

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FORM NRC-313 I (1-79)

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FORM NRC-313 I
(1-79)
10 CFR 30

U.S. NUCLEAR REGULATORY COMMISSION

APPLICATION FOR BYPRODUCT MATERIAL LICENSE
INDUSTRIAL

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 applications 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.

1. APPLICATION FOR:
(Check and/or complete as appropriate)

	a. NEW LICENSE
	b. AMENDMENT TO: LICENSE NUMBER
X	c. RENEWAL OF: LICENSE NUMBER 29-00505-15

2. APPLICANT'S NAME *(Institution, firm, person, etc.)*
Mobil Research & Development Corporation
TELEPHONE NUMBER: AREA CODE – NUMBER EXTENSION
609-737-3000

3. NAME OF PERSON TO BE CONTACTED REGARDING THIS APPLICATION
T. O. Mitchell
TELEPHONE NUMBER: AREA CODE – NUMBER EXTENSION
609-737-3000

4. APPLICANT'S MAILING ADDRESS *(Include Zip Code)*
P. O. Box 1025
Princeton, NJ 08540

5. STREET ADDRESS WHERE LICENSED MATERIAL WILL BE USED *(Include Zip Code)*
Pennington-Rocky Hill Road
Pennington, NJ 08534

(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.	Louis Deane Rollmann	Research Associate
b.		
c.		

JUL 8 1980

July PG3 Renewal
Brown

Applicant... 054214
Check No...
Amount/Fee Category...
Type of Fee... AUG 5 1980
Date Check Rec'd...
Received By... Brown

7. RADIATION PROTECTION OFFICER
J. R. Meeks

Attach a resume of person's training and experience as outlined in Items 16 and 17 and describe his responsibilities under Item ...

8. 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)	Hydrogen-3	any	N/A	1 curie
(2)	Carbon-14	any	N/A	100 millicuries
(3)				
(4)				

	DESCRIBE USE OF LICENSED MATERIAL E
(1)	Laboratory research
(2)	Laboratory research
(3)	
(4)	

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FORM NRC-313 I (1-79)

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9. STORAGE OF SEALED SOURCES

LINE NO.	CONTAINER AND/OR DEVICE IN WHICH EACH SEALED SOURCE WILL BE STORED OR USED. A.	NAME OF MANUFACTURER B.	MODEL NUMBER C.
(1)	No sealed sources		
(2)			
(3)			
(4)			

10. RADIATION DETECTION INSTRUMENTS

LINE NO.	TYPE OF INSTRUMENT A	MANUFACTURER'S NAME B	MODEL NUMBER C	NUMBER AVAILABLE D	RADIATION DETECTED (alpha, beta, gamma, neutron) E	SENSITIVITY RANGE (milliroentgens/hour or counts/minute) F
(1)	Liquid Scint. Counter	Packard	3375	1	β +	$1\text{-}10^6$ cpm
(2)	Thinwindow geiger counter	Nuclear Chicago	2612	2	β +	0.20 mr/hr
(3)						
(4)						

11. CALIBRATION OF INSTRUMENTS LISTED IN ITEM 10

☐ a. CALIBRATED BY SERVICE COMPANY

NAME, ADDRESS, AND FREQUENCY

☒ b. CALIBRATED BY APPLICANT

Attach a separate sheet describing method, frequency and standards used for calibrating instruments.

Internal sources supplied by manufacturer; each time used.

12. PERSONNEL MONITORING DEVICES

TYPE (Check and/or complete as appropriate.) A	SUPPLIER (Service Company) B	EXCHANGE FREQUENCY C
☐ (1) FILM BADGE ☐ (2) THERMOLUMINESCENCE DOSIMETER (TLD) ☒ (3) OTHER (Specify): Bioassay	Mobil Medical Department	☐ MONTHLY ☐ QUARTERLY ☒ OTHER (Specify): when working with tritium

13. FACILITIES AND EQUIPMENT (Check were appropriate and attach annotated sketch(es) and description(s).

☒ a. LABORATORY FACILITIES, PLANT FACILITIES, FUME HOODS (Include filtration, if any), ETC. See attachment

☐ b. STORAGE FACILITIES, CONTAINERS, SPECIAL SHIELDING (fixed and/or temporary), ETC.

☐ c. REMOTE HANDLING TOOLS OR EQUIPMENT, ETC.

☐ d. RESPIRATORY PROTECTIVE EQUIPMENT, ETC.

14. WASTE DISPOSAL

a. NAME OF COMMERCIAL WASTE DISPOSAL SERVICE EMPLOYED

Teledyne Isotopes

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.

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)* Richard H. Heck 7/2/80
	c. NAME *(Type or print)* R. H. Heck
(1) LICENSE FEE CATEGORY:	d. TITLE Administrative Manager
(2) LICENSE FEE ENCLOSED: $	e. DATE June 26, 1980

04426

FORM NRC-313 I (1-79)

ATTACHMENT TO APPLICATION FOR BYPRODUCT MATERIAL LICENSE

13. Facilities and equipment

Facility to be used is an enclosed metal hood exhausted with a face velocity of 100 ft./min. (minimum) located in a fully equipped laboratory room.

15. Radiation Protection Program

The proposed work will be carried out under guidelines established in Mobil's Radiation Safety Policy Manual and the Central Research Division Laboratory Radiological Safety Program Reference Manual previously submitted in support of the application for Byproduct Material Licenses, 29-00505-05, -08, -09, -11, and -12. In addition, all conditions attached to the original application 29-00505-15 and to correspondence under control #55624 remain in force (attached).

16, 17. Any use of licensed materials will be under the direct supervision of a fully trained chemist or chemical engineer. L. D. Rollmann received his Ph.D. in inorganic chemistry from the University of Kansas (1967) and spent a one-year post-doctoral training in physical chemistry at Cal Tech. He was trained on-the-job in the safe handling of the C-14 and H-3 materials of this License (1975-1977). His procedures were inspected in detail by an NRC radiation specialist in July 1976, and showed no items of non-compliance or unsafe conditions. A second inspection in January 1979, also showed no items of non-compliance.

04426

J. R. Meeks, Ph.D
Mobil Oil Corporation
Toxicology Division
P. O. Box 1026
Princeton, N. J. 08540
609-452-9440 Ext. 44

Present Position: Supervisor, Metabolism and Pharmacokinetics
Toxicology Division, Mobil Oil Corporation

Training and Experience in Radiation Use and Safety:

1. Shell Development Co., Modesto, California 95352 (1 year)

   a. Charge of radiolabelled animal metabolism & pharmacokinetic program for pesticides and animal health products.
   b. Worked with ^{14}C, ^{3}H and ^{119}Sn isotopes.
   c. Prepared standard operating procedures for use, quantitation and disposal of radioisotopes including incineration.
   d. Served as alternate to Radiation Safety Officer.
   e. Attended International Liquid Scintillation Conference. UC/SF Medical School, August 20-24, 1979.
   f. Used Packard 2660, 2650 and 3700 LS Counters, Packard 306 Oxidizer. HpLc with Berthold radiation detectors. Victoreen G/M Counters, Varian 3700 GC with ^{63}Ni EC detectors.

2. Diamond Shamrock Corporation (5 years)
   T. R. Evans Research Center
   P. O. Box 348
   Painesville, Ohio 44077

   a. Metabolism of Chemicals, pesticides, animal health products and pharmaceutical candidates in soil, water, air, ecoayatems, plants and animals.
   b. Worked with ^{14}C, ^{3}H and ^{32}P amd ^{63}Co.
   c. Assisted in training of company Radiation Safety Officer.
   d. Used Nuclear Chicago and Packard LS Counters, Packard Chromatographic Scanner (Model 3701). Harvey Biological Oxidizer, Survey meters and gamma counters.

J. R. Meeks, Ph.D
Mobil Oil Corporation
Toxicology Division
P. O. Box 1026
Princeton, N. J. 08540
609-452-9440 Ext. 44

Training and Experience in Radiation Use and Safety: (cont'd)

3. University of Illinois (4 years)
   Biochemistry Department
   School of Chemical Sciences
   Urbana, Illinois 61801

   a. Graduate Research in Metabolism Mechanisms.
   b. Worked with ^{14}C, ^{3}H, ^{59}Fe and ^{32}P.
   c. Taught Graduate Course entitled "Research Techniques with Radioisotopes".
      Radiochemistry Department, Dr. Robert Nystrom, Hd.
   d. Used Packard and Beckman LS Counters, G/M Survey Monitors, Gamma Counters and ^{59}Fe Mossbauer equipment, ^{63}Ni
   e. Synthesis ^{14}C and ^{3}H labelled intermediates.
   f. Training from Health Physics Department.

U. S. ATOMIC ENERGY COMMISSION
BYPRODUCT MATERIAL LICENSE

This Copy Is For Your Files

Pursuant to the Atomic Energy Act of 1954 and Title 10, Code of Federal Regulations, Chapter 1, Parts 30, 2, 33, 34, and 35, 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	
Mobil Research and Development Corp. Research Department Central Research Division P. O. Box 1025 Princeton, New Jersey 08540	3. License number 29-00505-15 4. Expiration date July 31, 1980 5. Reference No.

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
A. Hydrogen 3 B. Carbon 14	A. Any B. Any	A. 1 curie B. 100 millicuries

Authorized use

A. and B. Laboratory research.

CONDITIONS

Wherever the words "Atomic Energy Commission" or "Commission" appear in this license, except where the context of their use refers to a fact or event prior to January 19, 1975, they mean the Nuclear Regulatory Commission created by Public Law 93-438 and Executive Order No. 11834.

Division, Pennington-Rocky Hill Road, Pennington, New Jersey.

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."

Byproduct material shall be used by, or under the supervision of, Louis Deane Rollmann, Ph.D.

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(continued) CONDITIONS

13. The licensee shall not use byproduct material in or on human beings or in field applications where activity is released except as provided otherwise by specific condition of this license.

14. Individuals involved in operations which utilize, at any one time, more than 100 millicuries of Hydrogen 3 in a non-contained form, other than metallic foil, shall have bioassays performed within one week following a single operation and at weekly intervals for continuing operations.

15. Except as specifically provided otherwise by this license, the licensee shall possess and use byproduct material described in Items 6, 7, and 8 of this license in accordance with statements, representations, and procedures contained in application dated April 1, 1975 and letters with attachments dated June 13, 1975 and June 27, 1975.

For the U.S. Nuclear Regulatory Commission
~~For the U.S. Atomic Energy Commission~~

Nathan Basom

Date JUL 10 1975

by Materials Branch
Directorate of Licensing
Washington, D. C. 20555