INDIANA UNIVERSITY
SCHOOL OF MEDICINE

EVANSVILLE CENTER FOR MEDICAL EDUCATION
8600 University Boulevard
Evansville, Indiana 47712
(812) 464-1831

April 6, 1984

Mr. James Kappler, Director
U.S. Nuclear Regulatory Commission
Region III
Radioisotopes Licensing Section
799 Roosevelt Road
Glen Ellyn, Illinois 60137

RE: By-Product Material License #13-15734-01

Dear Mr. Kappler:

We are requesting the following amendments to our By-Product Material License #13-15734-01:

1. Item 6 on the license - To add as an individual user, Beat U. Raess, Ph.D. Attached are the Supplemental Sheets (pages 2 and 3) showing his Formal Training in Radiation Safety for the Individual User (item #16 on the license) and Experience for Individual User (item #17 on the license).

   Dr. Raess works in Room 331 in the Health Science Bldg. which is already approved for isotopes. See diagram on page 9 of 1978 renewal application.

2. Item 8 on the license - To increase possession amounts of:

   ^{45}Ca to 10 mCi
   ^{125}I to 15 mCi
   ^{32}P to 200 mCi

   We are also requesting the following additions to license material (item 8):

^{42}K	KCl in solution	20 mCi
^{86}Rb	.5M HCl solution	20 mCi

In order to expedite this amendment request, please do not hesitate to call us at 812-464-1831.

Sincerely,

George D. Guthrie, Ph.D.
Associate Director

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REG3 LIC30
13-15734-01 PDR

GDG/lr

Control No. 76786

7. RADIATION PROTECTION OFFICER

For administrative reasons, we request that the Radiation Protection Officer be changed back to Dr. George Guthrie. We want to retain Dr. Schaeffer as assistant who will function as Radiation Protection Officer on Dr. Guthrie's behalf as needed.

8. LICENSED MATERIAL

Element & Mass Number	Chemical and/or Physical Form	Name of Mfr. & Model No.	Maximum Number of Millicuries and/or Sealed Sources & Maximum Activity Per Source Which Will Be Possessed At Any One Time
		NA	
Hydrogen^{3}	Biochemical intermediates in solution or tritiated water.		500 mCi
Carbon^{14}	Biochemical intermediates in solution or inorganic salts.		25 mCi
Iodine^{125}	Iodine in NaOH solution or iodinated biochemicals.		15 mCi
Phosphorus^{32}	Orthophosphoric acid & biochemical intermediates.		200 mCi
Phosphorus^{33}	Biochemical intermediates in solution.		11 mCi
Sulfur^{35}	Biochemical intermediates in solution.		5 mCi
Chlorine^{36}	HCl solution.		2 mCi
Calcium^{45}	Solution.		15 mCi*
Sodium^{24}	Solution.		6 mCi
Potassium^{42}	KCl in solution.		20 mCi**
Rubidium^{86}	.5M HCl solution.		20 mCi**

*Request an additional 5 mCi increase over amendment request. See Supplemental Sheet, Page 2.

**Additions requested in amendment. See Supplemental Sheet, Page 2.

11. CALIBRATION OF INSTRUMENTS LISTED IN ITEM 10

A. Scintillation counters will be used for all quantitative determinations such as contamination measurements done with swipe tests. These will be calibrated as part of routine servicing by company representatives.

b. Survey meters will be tested for operation using a small check source. Any contamination discovered with the survey meter will be quantitated using a swipe test counted in the calibrated instruments. We do not feel that the survey meters are instruments that can be calibrated to quanitate radioactivity accurately. One survey meter is available at each location (Medical Education Bldg. and the Health Science Bldg.) for the users.

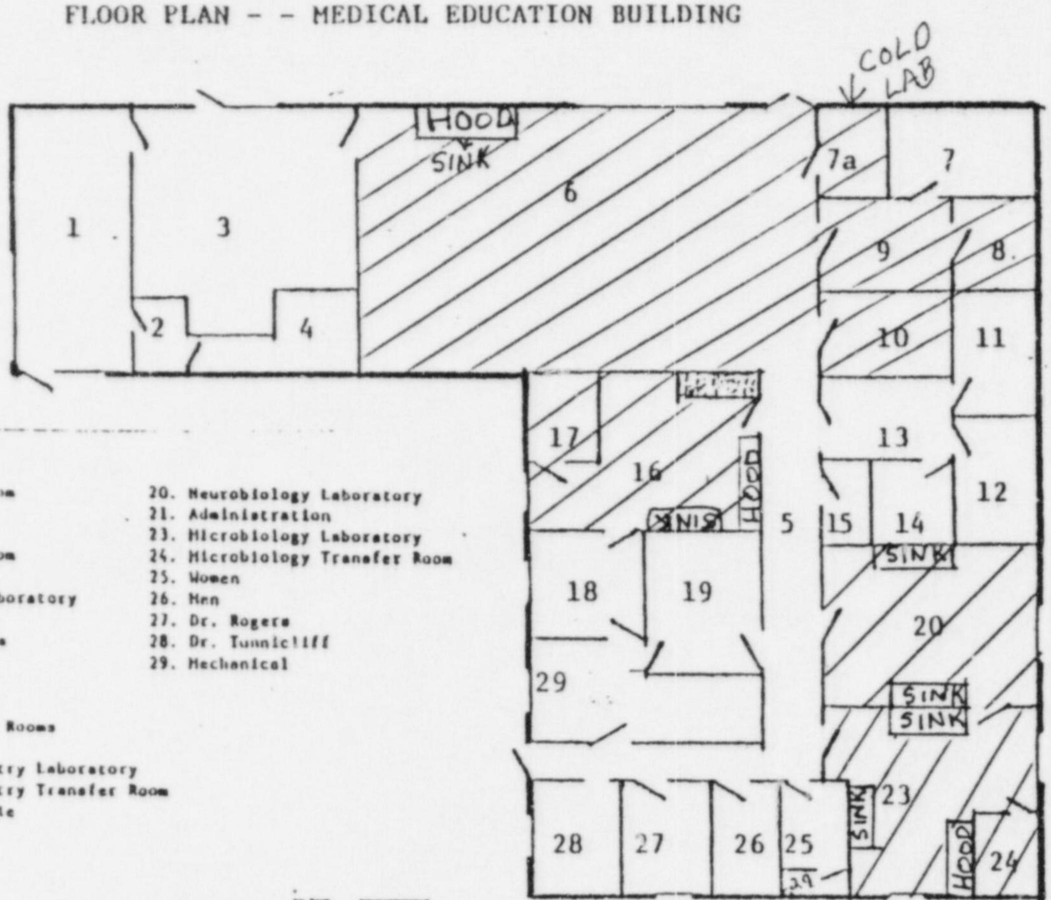
13. FACILITIES AND EQUIPMENT

Attached are floor plans of the two facilities in which isotope usage will occur (see Supplmental Sheets, pages 7 & 8). The area where isotopes will be stored, used and disposed of are indicated on the drawings. Both facilities are restricted from the general public. In addition, the laboratory areas are restricted for use by authorized personnel only. These personnel include faculty and staff of the Center and may also include medical students by specific permission. The number of faculty and staff at the Center is less than twenty-five.

Each laboratory using isotopes has an exhaust to the outside, either through a fume hood or equivalent exhaust fan so that the total exhaust of the room can be to the outside. Dilution of isotopes from stocks to the working concentrations for an experiment are made in the hood, if necessary, to further protect against contamination of the laboratory.

Bench tops are impervious to liquids, they are standard laboratory type material (Hamlite, Hamilton Manufacturing Co., Two Rivers, Wisconsin). Shielding is employed when necessary, e.g. for stock solutions of P-32 where bremsstrahlung activity may be significant. Normally plexiglass is employed as shielding material. Initial dilutions are made behind such shielding. Unpacking of isotopes includes the inspection of packing material for contamination.

FLOOR PLAN - - MEDICAL EDUCATION BUILDING



ROOM NUMBERS

1. Reading Room
2. Restroom
3. Classroom
4. Utility Room
5. Hall
6. Student Laboratory
7a. Cold Room
7. Supply Room
8. Dark Room
9. Prep Room
10. Washroom
11-14. Animal Rooms
15. Janitor
16. Biochemistry Laboratory
17. Biochemistry Transfer Room
18. Dr. Guthrie
19. Library
20. Neurobiology Laboratory
21. Administration
23. Microbiology Laboratory
24. Microbiology Transfer Room
25. Women
26. Men
27. Dr. Rogers
28. Dr. Tunnicliff
29. Mechanical

GRAPHIC SCALE IN FEET: 0 4 8 18

ROOM NUMBERS

300 - Director
301 - Administration
302 - Conference Room
303 - Library
304 - Study Carrels
305 - Lockers
306 - Student Study
307 - Areas
308 - Visiting Faculty
309 - Dr. Snively
310 - Technician
311 - AMEP
312 - AMEP
313 - AMEP
314 - Seminar Room
315 - Lecture Room
316 - Dr. Schaeffer
317 - Storage Room
318 - Cold Room
319
320 - Vivarium
321 - Animal Prep
322 - Dr. Matheson
323 - Dr. Gesser
324 - Dr. Gesser's Lab
325 - Dr. Gesser's Lab
326 - Histology Lab
327 - AV Room
328 - Letture Room
329
330 - Research Labs
331 - Vivarium
332 - Tissue Prep
333 - Dark Room
334 - Gross Lab
335 - Dr. Matheson's Lab

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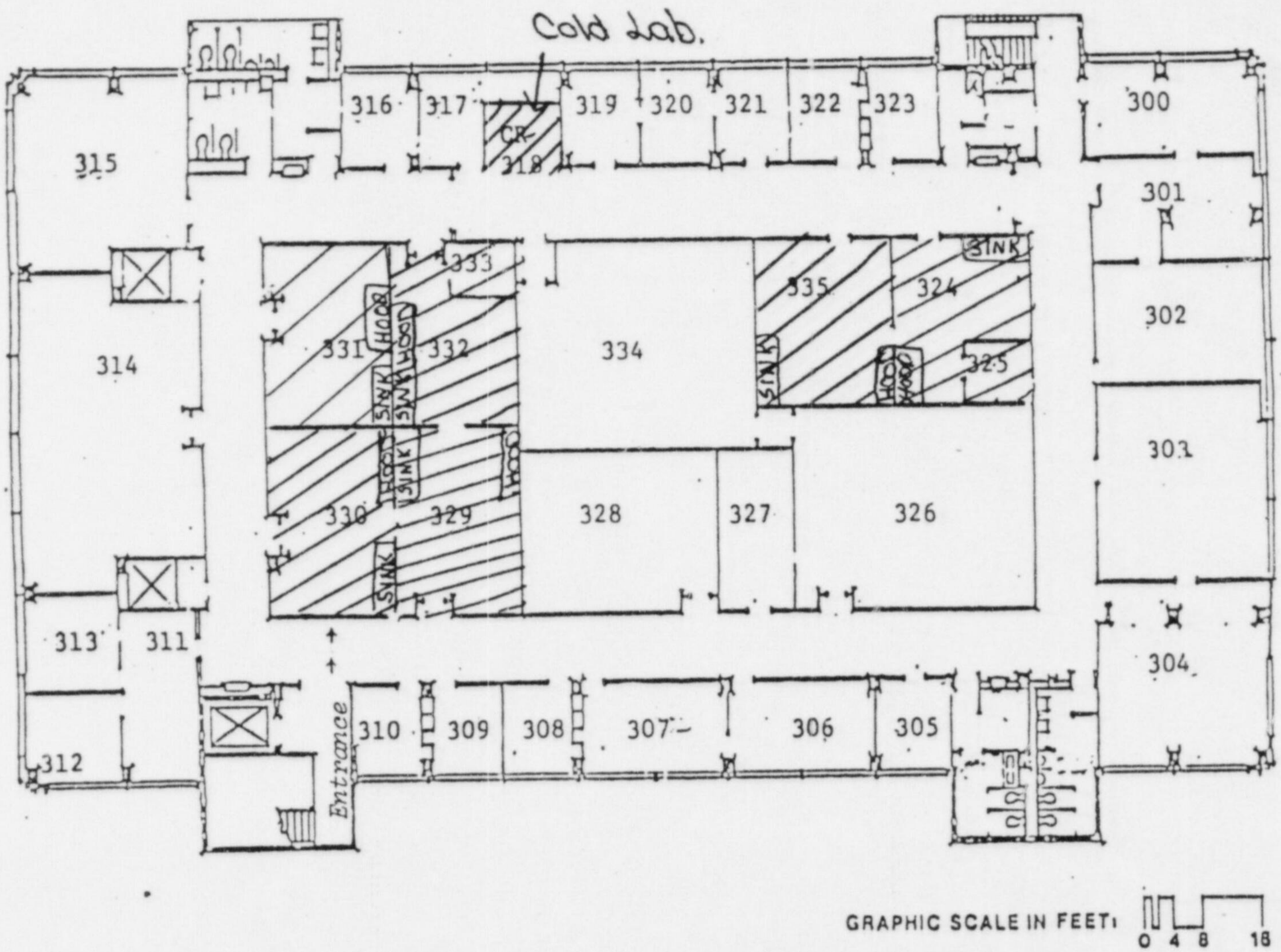

3RD LEVEL FLOOR PLAN
HEALTH SCIENCES BUILDING

TOTAL AREA 15,325 SQ. FT.

14. WASTE DISPOSAL

b. Radioactive wastes shall be stored in an approved waste storage container. Radioactive wastes to be discarded by sanitary sewer shall utilize only one designated basin in each of rooms, 6, 16, 20, 23, 324, 329, 330, 331, 334, and 335. These basins are connected to the acid waste disposal system. The basins are of the acid-resistant type and connect to three inch diameter polyethylene pipes. The acid wastes flow through a 100 gallon neutralization tank, filled with approximately 1500 pounds of limestone, prior to being discharged into the sanitary sewer system. It has been estimated that more than 500,000 gallons of water per month or about 16,000 gallons of water per day are discharged through these portions of the sanitary sewer. Furthermore, discharge of isotopes into the sanitary sewer shall be at concentrations within the limits set in Table II of Title 10, Part 20 for each isotope used. The rules specified in Section 20.306 will be followed to establish the limits for which materials may be disposed of as non-radioactive waste.

15. RADIATION PROTECTION PROGRAM

·Duties of the Radiation Protection Officer are to monitor the use and handling of radioisotopes to:

a. Assure that the use of radioactive material is by, or under the direct supervision of, individuals authorized in the license.

b. Assure that personnel are appropriately instructed in the proper handling of radioisotopes and that monitoring equipment is worn or used by individuals during isotope use when this is appropriate.

c. Assure that radioactive materials are properly secured against unauthorized use or removal.

d. Assure that routine inspections of all laboratories using or storing radioactive materials are performed and appropriate records are kept.

e. Assure that the terms and conditons of the license are periodically reviewed and records checked for compliance with Nuclear Regulatory Commission requirements.

·Control measures:

Isotopes are received at the receiving dock and delivered immediately to the individual user who will inspect the package and make necessary tests for contamination of packing material. Individual users will also maintain isotope inventories and disposal records.

Packages are not normally accepted by the university during off-duty hours. However, as a precaution, we have forwarded a memo to the receiving department and the security office describing the markings on isotope packages with instructions to deliver the package immediately to the appropriate building and to notify an authorized user of its receipt. (See Supplemental Sheet, Page 13.)

The responsibility for the survey of facilities rests with each authorized user. We believe this is the most effective control because isotope usage in our facility is sporadic and the authorized user is best prepared to know when and where to carry out specific swipe tests. A record sheet will include swipe check data on each experiment. These will be available for periodic inspection by the Radiation Protection Officer. The activities used in any one experiment are usually at or below exempt levels and this extent of inspecton should provide adequate control of areas where isotopes are used. We also feel that relating the frequency to the experiments performed is more effective, in our case, than to a calendar schedule. A copy of "Methods and Frequence for Conducting Surveys" will be available for each user and will be a further guide to regulate surveys by the authorized users. The toxicity classification is contained in our manual (Table 1, page 13). (See Appendix A.)

15. Cont'd. RADIATION PROTECTION PROGRAM

Bioassay procedures:

Tritium bioassays. Tritium assay by a method approved by the Radiation Protection Officer will be performed whenever the amount of tritium used in an experiment, or cumulatively over a month, exceeds those values given in Table 1 of "Guidelines for Bioassay Requirement for Tritium," Nuclear Regulatory Commission dated October 19, 1977 (see Supplemental Sheet, Page 14A). If tritium activities in any one experiment, or cumulatively over a month, exceed one-tenth of, but are not more than, the values given in Table 1, bioassays will only be performed if the design of the experiment, in the judgment of the Radiation Protection Officer, warrants a bioassay.

The bioassay normally used will be a urinalysis performed by counting an appropriate aliquote of at least 100 ml of urine.

Iodine125 bioassay: I-125 assays will be performed whenever the amount of I-125 used exceeds the values given in Table 1 of the Nuclear Regulatory Guide 8.20, April 1978. (See Supplemental Sheet, Page 14). If I-125 activities in any experiment exceed one-tenth, but are not more than, the amounts given in Table 1, bioassays will only be performed if the design of the experiment, in the judgment of the Radiation Protection Officer, warrants a bioassay. The bioassay used would be a scan of the thyroid using a GSM-5 Survey Meter equipped with a DGSP-2A plutonium and I-125 probe. The equipment would be standardized against a mechanical phantom in accordance with the recommendations contained in the Handbook 87, Clinical Dosimetry, U.S. Department of Commerce, Nationl Bureau of Standards, 1963.

The DGSP-2 probe would be on hand prior to initiation of usage of I-125 in these activity ranges.

Direct Monitoring:

Personnel monitoring for individuals handling quantities greater than 1 mCi of iodine-125, sodium-24, phosphorus-32, ribidium-86 or potassium-42 will be used. The type of monitoring equipment used will be that which the Radiation Protection Officer deems appropriate for the experimental conditions being used.

Day-to-day General Safety Instructions:

Each authorized user will receive a copy of the license and the isotope user manual and will familiarize himself with the procedures and limits of isotope usage permitted by the license. He will also be informed of his own responsibilities for the instruction and monitoring of staff under his supervision. A copy of the users manual is attached. It will be reviewed and revised from time to time to assure that isotope usage meets the terms and conditions of the isotope license.

15. Cont'd. RADIATION PROTECTION PROGRAM

Laboratory personnel will receive training on the hazards of isotopes, their safe handling and the terms and conditions of our license. Training will include audio-visual tapes, individual instruction by authorized users that covers the specific use of isotopes for each laboratory worker. Spills are handled according to item VI, page 14 of the attached manual (Appendix A).

Training of students will be the responsibility of each authorized user. It will be specific to cover a given situation and may include audiovisual training tapes, lectures and on the job training as needed.

Housekeeping and security personnel will be informed that radioisotopes are being used in the areas designated. They will be shown the radioisotope warning label and informed of its use. They will be further instructed to not remove any materials from the laboratory benches or from labelled isotope waste containers. They will also be informed of how they may obtain further information on isotopes.

The general safety instructions are a part of our "Regulations for Use of Radioisotopes" manual. The manual is enclosed for reference, however, the entire manual is not being submitted as an integral part of the application because we wish to be able to edit it, as the need may arise, without the approval of the NRC. The portions relevant to safety instruction to laboratory personnel are: Item I, page 2 of the manual; Item II D, page 3, E, page 4-6, Item V page 9-12. (See Appendix A.)

15. RADIATION PROTECTION PROGRAM

INDIANA UNIVERSITY SCHOOL OF MEDICINE
EVANSVILLE CENTER
P. O. Box 3287 – Evansville, Indiana 47732
(812) 479-2061

April 17, 1979

TO: Mailroom
Security Office

FROM: Dr. Guthrie

SUBJECT: Receipt of Radioisotopes

From time to time we will receive packages of radioisotopes as part of our normal supply shipments. These packages will be marked with an emblem similar to the one reproduced below. These packages should be delivered to the Center within three hours of receipt. One of the individuals listed below or their designated representative should receive the package.

During off-duty hours, if a package should be delivered, one of these individuals should be notified by phone of the receipt of the package. Notification should be attempted in the order listed.

Medical Education Building 8600 University Blvd.	Office Phone	Home Phone
Dr. George Guthrie	464-1831	985-2046
Dr. Howell Rogers	464-1832	464-8296
Dr. Godfrey Tunnicliff	464-1833	479-3711

Health Science Bldg. 1901 E. Walnut St.	Office Phone	Home Phone
Dr. John Schaeffer	479-2061	477-8225
Dr. Keith Matheson	479-2061	867-6189
Dr. George Guthrie	464-1831	985-2046

Table 1

ACTIVITY LEVELS ABOVE WHICH BIOASSAY FOR I-125 OR I-131 IS NECESSARY

Types of Operation	Activity Handled at Any One Time in Unsealed Form Making Bioassay Necessary*: Volatile or Dispersible*	Activity Handled at Any One Time in Unsealed Form Making Bioassay Necessary*: Bound to Nonvolatile Agent*
Processes in open room or bench, with possible escape of iodine from process vessels	0.1 mCi	1 mCi
Processes with possible escape of iodine carried out within a fume hood of adequate design, face velocity, and performance reliability	1 mCi	10 mCi
Processes carried out within gloveboxes, ordinarily closed, but with possible release of iodine from process and occasional exposure to contaminated box and box leakage	10 mCi	100 mCi

*Quantities present may be considered the amount in process by a worker at one time. Quantities in the right-hand column may be used when it can be shown that activity in process is always chemically bound and processed in such a manner that I-125 or I-131 will remain in nonvolatile form and diluted to concentrations less than 0.1 µCi/mg of nonvolatile agent. Capsules (such as gelatin capsules given to patients for diagnostic tests) may be considered to contain the radioiodine in nonfree form, and bioassay would not be necessary unless a capsule were inadvertently opened (e.g. dropped and crushed). On the other hand, certain compounds where radioiodine is normally bound are known to release radioiodine when the material is in process, and the left-hand column may then be applicable. In those laboratories working only with I-125 in radioimmunassay (RIA) kits, the quantities of I-125 are very small and in less volatile forms; thus, bioassay requirements may be judged from the right-hand column.

Table 1

ACTIVITY LEVELS OR CONCENTRATIONS ABOVE WHICH BIOASSAY SHALL BE REQUIRED FOR H^3

Types of Operation	HTO Form (& forms other than those on right-hand cols)	HT or T_2 Gas in Sealed Processed Vessels	Nucleotide Precursors	HTO Mixed with More Than 10 Kg of Inert H_2O or Other Substances
Process in open room or bench, with possible escape of tritium from process vessels	0.1 Ci	100 Ci	0.01 Ci	0.01 Ci/Kg
Process with possible escape of tritium, carried out within a fume hood of adequate design, face velocity, and performance reliability	1 Ci	1,000 Ci	0.01 Ci	0.01 Ci/Kg
Processes carried out within gloveboxes, ordinarily closed, but with possible release of tritium from process and occasional exposure to contaminated box and box leakage	10 Ci	10,000 Ci	1 Ci	1 Ci/Kg

Quantities present (<10Kg) may be considered either the amount processed by an individual at any one time (when accidental intake is more likely), or the amount of activity entered into process (throughput) during any one month when routine handling of repeated batches is the more likely source of exposure). Concentrations in the right-hand column may be used when activity in process is always diluted in more than 10 Kg of other reagents, as in nuclear reactor coolant systems.

16. FORMAL TRAINING IN RADIATION SAFETY FOR INDIVIDUAL USER NAMES IN ITEM 6.

Name: George D. Guthrie, Ph.D.

	Type of Training	Where Trained	Dates of Training	On the Job	Formal Course
a.	Principles and practices of radiation protection.	Indiana University	1965-71	(Yes) No	(Yes) No
b.	Radioactivity measurement standardization and monitoring techniques and instruments.	Iowa State University	1955	Yes (No)	(Yes) No
		Calif. Institute of Technology	1957	(Yes) No	Yes (No)
		MIT	1963	(Yes) No	(Yes) No
		Indiana University	1965	(Yes) No	Yes (No)
c.	Mathematics and calculations basic to the use and measurement of radioactivity.	Same as b.		(Yes) No	Yes (No)
d.	Biological effects of radiation.	Same as b.		(Yes) No	(Yes) No
e.	Area Radiation Protection Officer - Chemistry Dept.	Indiana University	1966-71	(Yes) No	Yes (No)
f.	Chemistry Representative Radiation Control Committee	Indiana University	1966-71	(Yes) No	Yes (No)
g.	Responsible Investigator for use of radioisotopes.	Indiana University	1965-71	(Yes) No	Yes (No)
h.	Radiation Protection Officer	Evansville Center Indiana Univ. Sch. of Medicine	1973-80	(Yes) No	Yes (No)

16. FORMAL TRAINING IN RADIATION SAFETY FOR INDIVIDUAL USER NAMES IN ITEM 6.

Name: G. Keith Matheson, Ph.D.

	Type of Training	Where Trained	Dates of Training	On the Job	Formal Course
a.	Principles and practices of radiation protection.	Brigham Young Univ.	5 mos. 1962	Yes (No)	(Yes) No
b.	Radioactivity measurement standardization and monitoring techniques and instruments.	" " "	" "	Yes (No)	(Yes) No
c.	Mathematics and calculations basic to the use and measurement of radioactivity.	" " "	" "	Yes (No)	(Yes) No
d.	Biological effects of radiation.	" " "	" "	Yes (No)	(Yes) No
e.	Biological Warfare	U.S. Army	1 mo. 1958	Yes (No)	(Yes) No

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16. FORMAL TRAINING IN RADIATION SAFETY FOR INDIVIDUAL USER NAMES IN ITEM 6.

Name: Howell W. Rogers, Ph.D.

	Type of Training	Where Trained	Dates of Training	On the Job	Formal Course
a.	Principles and practices of radiation protection.	Univ. of Mississippi Medical Center	1970-72	(Yes) No	Yes (No)
b.	Radioactivity measurement standardization and monitoring techniques and instruments.	" "	" "	(Yes) No	Yes (No)
c.	Mathematics and calculations basic to the use and measurement of radioactivity.	" "	" "	(Yes) No	Yes (No)
d.	Biological effects of radiation.	" "	1965	Yes (No)	(Yes) No

16. FORMAL TRAINING IN RADIATION SAFETY FOR INDIVIDUAL USER NAMES IN ITEM 6.

Name: John F. Schaeffer, Ph.D.

	Type of Training	Where Trained	Dates of Training	On the Job	Formal Course
a.	Principles and practices of radiation protection.	Syracuse Univ.	1966-70	(Yes) No	Yes (No)
b.	Radioactivity measurement standardization and monitoring techniques and instruments.	Syracuse Univ. Yale Univ.	1966-70 1970-72	(Yes) No	Yes (No)
c.	Mathematics and calculations basic to the use and measurement of radioactivity.	Syracuse Univ. Yale Univ. Tufts Univ.	1966-70 1970-72 1972-78	(Yes) No	Yes (No)
d.	Biological effects of radiation.	Syracuse Univ.	1966-68	(Yes) No	Yes (No)
e.	Radiation Protection Officer	Evansville Center Indiana Univ. Sch. of Medicine	1981-84	(Yes) No	Yes (No)

16. FORMAL TRAINING IN RADIATION SAFETY FOR INDIVIDUAL USER NAMES IN ITEM 6.

Name: Godfrey Tunnicliff, Ph.D.

	Type of Training	Where Trained	Dates of Training	On the Job	Formal Course
a.	Principles and practices of radiation protection.	Univ. of Southhampton	1966-69	(Yes) No	(Yes) No
b.	Radioactivity measurement standardization and monitoring techniques and instruments.	" "	" "	(Yes) No	(Yes) No
c.	Mathematics and calculations basic to the use and measurement of radioactivity.	" "	" "	(Yes) No	Yes (No)
d.	Biological effects of radiation.	" "	" "	Yes (No)	(Yes) No

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Control No. 76786

16. FORMAL TRAINING IN RADIATION SAFETY FOR INDIVIDUAL USER NAMES IN ITEM 6.

Name: Beat U. Raess, Ph.D.

	Type of Training	Where Trained	Dates of Training	On the Job	Formal Course
a.	Principles and practices of radiation protection.	Univ. of Rochester Univ. of Washington	1967-70 1970-82	(Yes) No	(Yes) No
b.	Radioactivity measurement standardization and monitoring techniques and instruments.	same as above		(Yes) No	Yes No
c.	Mathematics and calculations basic to the use and measurement of radioactivity.	same as above		(Yes) No	Yes No
d.	Biological effects of radiation.	same as above		(Yes) No	Yes No

17. EXPERIENCE FOR INDIVIDUAL USER NAMED IN ITEM 6.

Name: George D. Guthrie, Ph.D.

Isotope	Maximum Amount	Where Experience Occurred	Duration of Experience	Type of Use
C^{14}	5 mCi	MIT	1962-65	Tracer Work
C^{14}	5 mCi	Indiana University	1965-71	" "
P^{32}	10 mCi	" "	" "	" "
H^{3}	10 mCi	" "	" "	" "
C^{14}	5 mCi	Evansville Center Indiana Univ. Sch. of Medicine	1973-Pres.	" "
H^{3}	10 mCi	Evansville Center Indiana Univ. Sch. of Medicine	" "	" "

17. EXPERIENCE FOR INDIVIDUAL USER NAMED IN ITEM 6.

Name: G. Keith Matheson, Ph.D.

Isotope	Maximum Amount	Where Experience Occurred	Duration of Experience	Type of Use
R_a^{226}	1 mCi	Brigham Young Univ.	5 months	Formal Training
Fe^{S9}	50 µC	" " "	"	" "
P^{32}	2 mCi	" " "	"	" "
H^3	1 mCi	" " "	"	" "
C^{14}	20 mCi	" " "	"	" "
S^{35}	1 mCi	" " "	"	" "
C^{14}	1 mCi	" " "	15 months	InVivo Studies/ Autoradiography
Cr^{51}	2 mCi	" " "	6 months	InVivo Studies/ γ counting
H^3	1 mCi	Univ. of Washington	6 months	InVitro/Autoradiography Scintillation
C^{14}	5 mCi	" "	3 years	InVivo/γcounting
H^3	20 mCi	Indiana University	8 yrs.	InVitro/Autoradiography & Radioimmuno Assays
C^{14}	2 mCi	" "	8 yrs.	Radioimmuno Assays

17. EXPERIENCE FOR INDIVIDUAL USER NAMED IN ITEM 6.

Name: Howell W. Rogers, Ph.D.

Isotope	Maximum Amount	Where Experience Occurred	Duration of Experience	Type of Use
C^{14}	500 μCi	Univ. of Mississippi	2 years	Microbiology Research
		Indiana University	12 years	"
H^3	2 Ci	Univ. of Mississippi	2 years	"
		Indiana University	12 years	"
P^{32}	10 mCi	Univ. of Mississippi	2 years	"
		Indiana University	12 years	"

17. EXPERIENCE FOR INDIVIDUAL USER NAMED IN ITEM 6.

Name: John F. Schaeffer, Ph.D.

Isotope	Maximum Amount	Where Experience Occurred	Duration of Experience	Type of Use
H^3	1 mCi	Syracuse University Yale University Tufts University	1966-70 1970-72 1972-78	Measurement of solution Fluxes across biological membranes
C^{14}	1 mCi	" "	" "	" "
$N_a{}^{22}$	1 mCi	" "	" "	" "
$N_a{}^{24}$	5 mCi	" "	" "	" "
K^{42}	5 mCi	Syracuse University	1966-70	" "
Cl^{36}	1 mCi	Yale University	1970-72	" "
P^{32}	1 mCi	" "	" "	" "
Ca^{45}	1 mCi	Yale University Tufts University	1970-72 1972-78	" " " "
$H_g{}^{203}$	1 mCi	Yale University	1970-72	" "

17. EXPERIENCE FOR INDIVIDUAL USER NAMED IN ITEM 6.

Name: Godfrey Tunnicliff, Ph.D.

Isotope	Maximum Amount	Where Experience Occurred	Duration of Experience	Type of Use
C^{14}	5 mCi	Univ. of Southampton	3 years	Tracer techniques
		Univ. of Saskatchewan	3 years	" "
		City of Hope Medical Ctr.	18 months	" "
		Clinical Research Institute of Montreal	3 years	" "
		Indiana University	6 years	" "
H^{3}	50 mCi	Same as above		
P^{32}	500 µCi	Clinical Research Institute of Montreal	1 year	" "

17. EXPERIENCE FOR INDIVIDUAL USER NAMED IN ITEM 6.

Name: Beat U. Raess, Ph.D.

Isotope	Maximum Amount	Where Experience Occurred	Duration of Experience	Type of Use
K^{42}	5 mCi	Univ. of Rochester	1967-70	Tracers in basic research
Rb^{86}	5 mCi	" "	" "	" "
P^{32}	10 mCi	" "	" "	" "
Ca^{45}	5 mCi	" "	" "	" "
P^{32}	10 mCi	Univ. of Washington	1970-82	" "
I^{125}	10 mCi	Univ. of Washington	1970-82	" "
C^{14}	2 mCi	" "	" "	" "
H^3	5 mCi	" "	" "	" "