FORM NRC-313 I (1-79) 10 CFR 30 — U.S. NUCLEAR REGULATORY COMMISSION

APPLICATION FOR BYPRODUCT MATERIAL LICENSE
INDUSTRIAL

1. APPLICATION FOR: 0927 (Check and/or complete as appropriate)

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.

- a. NEW LICENSE
- b. AMENDMENT TO LICENSE NUMBER
- X c. RENEWAL OF LICENSE NUMBER: 22-13390-01

2. APPLICANT'S NAME (Institution, firm, person, etc.)
US Environmental Protection Agency
Environmental Research Lab-Duluth
TELEPHONE NUMBER: AREA CODE – NUMBER EXTENSION
218-727-6692, ext 523

3. NAME OF PERSON TO BE CONTACTED REGARDING THIS APPLICATION
Allan R Batterman
TELEPHONE NUMBER: AREA CODE – NUMBER EXTENSION
218-727-6692, ext 523

4. APPLICANT'S MAILING ADDRESS (Include Zip Code)
USEPA
Environmental Research Lab-Duluth
6201 Congdon Blvd
Duluth MN 55804

5. STREET ADDRESS WHERE LICENSED MATERIAL WILL BE USED (Include Zip Code)
See Supplementary Sheet A

(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.	SEE SUPPLEMENTARY SHEET(S) B	
b.		
c.		

7. RADIATION PROTECTION OFFICER
Allan R. Batterman
(See Supplementary Sheet (s) C)

Attach a resume of person's training and experience as outlined in Items 16 and 17 and describe his responsibilities under Item 15.

8. LICENSED MATERIAL

LINE NO.	A ELEMENT AND MASS NUMBER	B CHEMICAL AND/OR PHYSICAL FORM	C NAME OF MANUFACTURER AND MODEL NUMBER (If Sealed Source)	D MAXIMUM NUMBER OF MILLICURIES AND/OR SEALED SOURCES AND MAXIMUM ACTIVITY PER SOURCE WHICH WILL BE POSSESSED AT ANY ONE TIME
(1)	SEE SUPPLEMENTARY SHEET D			
(2)				
(3)				
(4)				

	E DESCRIBE USE OF LICENSED MATERIAL
(1)	SEE SUPPLEMENTARY SHEET D
(2)	
(3)	
(4)	

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FORM NRC-313 I (1-79)

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)	#3, Source Housing (lead safe not in use)		
(2)	#5, Source Housing & G.C. (lead safe not in use)	Tracor	Source 111019-0001 GC Tracor 550
(3)		Perkins Elmer	Source 069 712 GC F-42
(4)		Hewlett Packard	Source 18713A GC HP 5700A Sears

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)		SEE SUPPLEMENTARY SHEET E				
(2)						
(3)						
(4)						

11. CALIBRATION OF INSTRUMENTS LISTED IN ITEM 10

☐ a. CALIBRATED BY SERVICE COMPANY

NAME, ADDRESS, AND FREQUENCY

XX b. CALIBRATED BY APPLICANT

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

See Supplementary Sheet E

12. PERSONNEL MONITORING DEVICES

TYPE (Check and/or complete as appropriate.) A	SUPPLIER (Service Company) B	EXCHANGE FREQUENCY C
XX (1) FILM BADGE	G.D. Searle Company Film Badge Division Des Plaines IL	X MONTHLY
☐ (2) THERMOLUMINESCENCE DOSIMETER (TLD)		☐ QUARTERLY
☐ (3) OTHER (Specify): see Supplementary Sheet F, parts A, B & C	SEE SUPPLEMENTARY SHEET(S) F	☐ OTHER (Specify):

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

XX a. LABORATORY FACILITIES, PLANT FACILITIES, FUME HOODS (Include filtration, if any), ETC.

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

☐ c. REMOTE HANDLING TOOLS OR EQUIPMENT, ETC. SEE SUPPLEMENTARY SHEET(S) G

☐ d. RESPIRATORY PROTECTIVE EQUIPMENT, ETC.

14. WASTE DISPOSAL

a. NAME OF COMMERCIAL WASTE DISPOSAL SERVICE EMPLOYED

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.

SEE SUPPLEMENTARY SHEET(S) H

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.

SEE SUPPLEMENTARY SHEET(S) I AND RADIOLOGICAL HEALTH & SAFETY MANUAL

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.

SEE SUPPLEMENTARY SHEET(S) B & J

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.

SEE SUPPLEMENTARY SHEET(S) B

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)*
	c. NAME *(Type or print)* Allan Richard Batterman
(1) LICENSE FEE CATEGORY:	d. TITLE Radiological Health & Safety Officer
(2) LICENSE FEE ENCLOSED: $	e. DATE 27 March 1980

FORM NRC-313 I (1-79)

SUPPLEMENTARY SHEET A

Item #5 (see addendum)

By-product material shall be used at the licensee's address stated in Item #4; sealed source gas chromatographs shall be used at its Monticello Ecological Research Station, PO Box 500, Monticello MN 55362 on the grounds of the Northern States Power Nuclear Power Plant, and at temporary job sites of the licensee anywhere in the United States.

Temporary job site usage would be for the determination of productivity and bioaccumulation (C_{14} and H_3). The tests would be carried out in sealed containers, and these containers would be returned to the lab in Duluth for analysis and disposal. All test sites would be properly labeled and secured against removal by fencing or enclosing the area against unauthorized removal or use.

0927

SUPPLEMENTARY SHEET B

6. Individual User (Name and Title): Timothy W. Neiheisel, Research Aquatic Biologist

Training and Experience of each user:

16.

Type of Training	Where Trained	Duration of Training	On the Job (Y or N)	Formal Course (Y or N)
a. Principles and practices of radiation protection	University of Cincinnati Course for certification for use of radiation (see attached certification)	1 day		Y
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 with Radiation

Isotope	Max Amt	Where Experience Gained	Duration of Experience	Type of Use
C^{14}	100 µC	Graduate School, Univ of Cincinnati	3 years	Uptake studies & autoradiography of labeled pesticides.
C^{14} P^{32}	"	Graduate teaching asst-taught 3 qtrs of a course in biological research methods	~3 months	Metabolism studies

UNIVERSITY OF CINCINNATI RADIATION SAFETY COMMITTEE

CERTIFICATION FOR USE OF RADIATION

(Prepare in duplicate. Original must be filed with Radiation Safety Committee. The duplicate is to be retained by the individual working. This form must be completed before beginning work with radiation).

NAME: Timothy W. Neiheisel Age: 26 MALE: X FEMALE: ___

HOME ADDRESS: 2600 Westwood Northern Blvd. HOME PHONE: 662-8253

UNIVERSITY TITLE: Graduate

LOCATION OF LABORATORY: Biology Dept PHONE: ___

LOCATION OF OFFICE: Biology PHONE: ___

FACULTY SUPERVISOR: Dr. Fraser (for graduate students, technicians, University employees).

I certify that I have received instruction in the safe use of radiation, that I have read and understand the University of Cincinnati Radiation Safety Manual and the regulations of the U.S. Atomic Energy Commission.

Date: March 27 1969 Timothy W. Neiheisel (Signed)

Received by Radiation Safety Committee on ___ per ___

APPLICANT SUCCESSFULLY COMPLETED UNIVERSITY OF CINCINNATI COURSE ON 3 April 1969 (date)

per James B Kenakes R.S.O.

FOR INDIVIDUALS HAVING PREVIOUS RADIATION EXPERIENCE:

APPLICANT HAS HAD ADEQUATE TRAINING AND EXPERIENCE AT ___ (Institution)

from ___ to ___ under the supervision of ___

___ (Name and title)

(NOTE:) You are required to read and understand the University of Cincinnati Radiation Safety Manual and regulations of the AEC.

The original of this form is to be sent to the Radioisotope Laboratory, General Hospital, Attn: Radiation Safety Committee, before beginning work with radiation.

SUPPLEMENTARY SHEET B

Item # 6. Individual User (Name and Title): James M. McKim, Ph.D., Research Aquatic Biologist

Training and Experience of each user:

Item #16.

Type of Training	Where Trained	Duration of Training	On the Job (Y or N)	Formal Course (Y or N)
a. Principles and practices of radiation protection	AEC Course Oak Ridge TN	1 month	N	Y
b. Radioactivity measurement standardization and monitoring techniques and instruments.	AEC Course Oak Ridge TN	1 month	N	Y
	ERL-Duluth MN	3 months	Y	N
c. Mathematics and calculations basic to the use and measurement of radioactivity.	AEC Course Oak Ridge TN	1 month	N	Y
d. Biological effects of radiation	AEC Course Oak Ridge TN	1 month	N	Y

Item # 17. Experience with Radiation

Isotope	Max Amt	Where Experience Gained	Duration of Experience	Type of Use
H^3	50 ml	AEC Coursework	1 month	organic tracers
C^{14}	50 ml	AEC Course and ERL-D	4 months	organic tracers & chlorophyll
P^{32}	50 ml	AEC Coursework	1 month	organic tracers

SUPPLEMENTARY SHEET B

Item # 6. Individual User (Name and Title): Dan Call, Visiting Scientist

Item # 16. Training and Experience of each user:

Type of Training	Where Trained	Duration of Training	On the Job (Y or N)	Formal Course (Y or N)
a. Principles and practices of radiation protection	Univ of South Dakota	1 semester	N	Y
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	" "	"	"	"

Item # 17. Experience with Radiation

Isotope	Max Amt	Where Experience Gained	Duration of Experience	Type of Use
^{14}C	1 mc	ERL-Duluth MN	1½ yrs	Bioconcentration studies

SUPPLEMENTARY SHEET B

Item #6. Individual User (Name and Title): Larry Brooke, Visiting Scientist

Training and Experience of each user:

Item #6. Type of Training	Where Trained	Duration of Training	On the Job (Y or N)	Formal Course (Y or N)
a. Principles and practices of radiation protection	Eastern Michigan Univ, Ypsilanti MI	1 semester	N	Y
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	" "	"	"	"

Item # 17. Experience with Radiation

Isotope	Max Amt	Where Experience Gained	Duration of Experience	Type of Use
^{14}C	1 mc	ERL-Duluth MN	One year	biological effects testing

SUPPLEMENTARY SHEET B

Item #6. Individual User (Name and Title): Gary E. Glass, Senior Research Chemist

Item #16. Training and Experience of each user:

Type of Training	Where Trained	Duration of Training	On the Job (Y or N)	Formal Course (Y or N)
a. Principles and practices of radiation protection	None			
b. Radioactivity measurement standardization and monitoring techniques and instruments.	Univ of MN-Duluth Wash State Univ	3 months 5 months	N N	Y Y
c. Mathematics and calculations basic to the use and measurement of radioactivity.	Univ of MN-Duluth Wash State Univ	3 months 5 months	N N	Y Y
d. Biological effects of radiation				

Item #17. Experience with Radiation

Isotope	Max Amt	Where Experience Gained	Duration of Experience	Type of Use
^{3}H	10 mc	Univ of MN-Duluth and Wash State Univ	8 months	Student experiments
^{14}C	10 mc	" "	"	" "

SUPPLEMENTARY SHEET B

Item #6. Individual User (Name and Title): Gilman D. Veith, Research Chemist

Item #16. Training and Experience of each user:

Type of Training	Where Trained	Duration of Training	On the Job (Y or N)	Formal Course (Y or N)
a. Principles and practices of radiation protection	Augustana College, Cornell University, Univ of WI-Madison	1962 to 1972	Y	Y
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	" "	"	"	"

Item #17. Experience with Radiation

Isotope	Max Amt	Where Experience Gained	Duration of Experience	Type of Use
^{63}Ni	15 mc	ERL-Duluth MN	1972-1979	GC detectors
^{3}H	250 mc	ERL-Duluth MN	" "	" "

SUPPLEMENTARY SHEET B

Item # 6. Individual User (Name and Title): Philip M. Cook, Research Chemist

Item #16. Training and Experience of each user:

Type of Training	Where Trained	Duration of Training	On the Job (Y or N)	Formal Course (Y or N)
a. Principles and practices of radiation protection	Lowry AFB, CO	6 months	Y	Y
b. Radioactivity measurement standardization and monitoring techniques and instruments.	Sandia AFB, NM	3 weeks	Y	Y
	Lowry AFB, CO	6 months	Y	Y
c. Mathematics and calculations basic to the use and measurement of radioactivity.	Sandia AFB, NM	3 weeks	N	Y
d. Biological effects of radiation	Sandia AFB, NM	3 weeks	N	Y

Item # 17. Experience with Radiation

Isotope	Max Amt	Where Experience Gained	Duration of Experience	Type of Use
		ERL-Duluth MN	7 yrs	X-ray diffraction

SUPPLEMENTARY SHEET B

Item # 6. Individual User (Name and Title): Douglas W. Kuehl, Chemist

Item #16. Training and Experience of each user:

Type of Training	Where Trained	Duration of Training	On the Job (Y or N)	Formal Course (Y or N)
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				

Item #17. Experience with Radiation

Isotope	Max Amt	Where Experience Gained	Duration of Experience	Type of Use
^{3}H	250 mc	ERL-Duluth MN	2 yrs	GC detector
^{63}Ni	15 mc	" "	"	" "

SUPPLEMENTARY SHEET B

Item # 6. Individual User (Name and Title): Alfred Jarvinen, Research Aquatic Biologist

Item #16. Training and Experience of each user:

Type of Training	Where Trained	Duration of Training	On the Job (Y or N)	Formal Course (Y or N)
a. Principles and practices of radiation protection	College of St. Scholastica, Duluth	4 Apr-11 June 1972	N	Y
b. Radioactivity measurement standardization and monitoring techniques and instruments.	" "	" "	"	"
c. Mathematics and calculations basic to the use and measurement of radioactivity.	College of St. Scholastica, Duluth	4 Apr-11 June 1972	N	Y
	ERL-Duluth MN	1971-1976	Y	N
d. Biological effects of radiation	College of St. Scholastica, Duluth	4 Apr-11 June 1972	N	Y

Item #17. Experience with Radiation

Isotope	Max Amt	Where Experience Gained	Duration of Experience	Type of Use
^{14}C	500 mc	ERL-Duluth MN	5 years	Food uptake tracer study
^{3}H	10 mc	ERL-Duluth MN	5 years	" "
^{4}C	10 mc	College of St. Scholastica, Duluth	20 hrs	Tracers

SUPPLEMENTARY SHEET B

Item # 6. Individual User (Name and Title): Leonard H. Mueller, Chemist

Item #16. Training and Experience of each user:

Type of Training	Where Trained	Durati Traini	On the Job (Y or N)	Formal Course (Y or N)
a. Principles and practices of radiation protection	FDA in New York	1 week	Y	N
	U of M-Duluth	2 hr	N	Y
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				

Item # 17. Experience with Radiation

Isotope	Max Amt	Where Experience Gained	Duration of Experience	Type of Use
^{14}C	200 mc	Mayo Foundation, USEPA	2 yrs + 7 yrs	Tissue studies
^{63}N	15 mc	FDA, USEPA	5 yrs + 7 yrs	E.C.
^{3}H	200 mc	FDA, USEPA	5 yrs + 7 yrs	E.C.
^{32}P	--	Mayo Foundation	2 yrs	Tissue studies
		Cleaning E.C. cells (^{3}H foils plus ^{63}Ni foils)		

SUPPLEMENTARY SHEET B

Item #6. Individual User (Name and Title): Frank Puglisi, Chemist

Training and Experience of each user:

Item #6.

Type of Training	Where Trained	Duration of Training	On the Job (Y or N)	Formal Course (Y or N)
a. Principles and practices of radiation protection	N/A			
b. Radioactivity measurement standardization and monitoring techniques and instruments.	N/A			
c. Mathematics and calculations basic to the use and measurement of radioactivity.	N/A			
d. Biological effects of radiation	N/A			

Item #7. Experience with Radiation

Isotope	Max Amt	Where Experience Gained	Duration of Experience	Type of Use
^{63}Ni	15 mc	ERL-Duluth MN	Unk	CC Detector
^{3}H	200 mc	ERL-Duluth MN	Unk	GC Detector
		Use as detector for GC with most of my work. Occasions for cleaning detectors are rare (3 times in 9 yrs).		

SUPPLEMENTARY SHEET B

Item # 6. Individual User (Name and Title): John I. Teasley, Chemist

Training and Experience of each user:

Item #16.

Type of Training	Where Trained	Duration of Training	On the Job (Y or N)	Formal Course (Y or N)
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	ERL-Athens GA ERL-Duluth MN	3 yrs 2 yrs	Y	N

Item # 17. Experience with Radiation

Isotope	Max Amt	Where Experience Gained	Duration of Experience	Type of Use
^{3}H	5 mc	ERL-Athens GA	3 yrs	Metabolic studies
^{14}C	5 mc	ERL-Athens GA	3 yrs	" "
^{14}C	"	ERL-Duluth MN	1 yr	" "

(3)

SUPPLEMENTARY SHEET C

Item #7. Individual User (Name and Title): Allan R. Batterman, Environmental Scientist

Training and Experience of each user:

Type of Training	Where Trained	Duration of Training	On the Job (Y or N)	Formal Course (Y or N)
a. Principles and practices of radiation protection	Bemidji State Univ Bemidji MN	1 qtr	Y	Y
	EMSL-Las Vegas NV *	1 week	Y	Y
	Update-EMSL-LV*	2 days	Y	Y
	Update-EMSL-LV*	2 days	Y	Y
b. Radioactivity measurement standardization and monitoring techniques and instruments.	Same as "a"	"	"	"
c. Mathematics and calculations basic to the use and measurement of radioactivity.	Same as "a"	"	"	"
d. Biological effects of radiation	Same as "a"	"	"	"

*see attached course outline

Experience with Radiation

Isotope	Max Amt	Where Experience Gained	Duration of Experience	Type of Use
^{238}Pu	1μc	EMSL-Las Vegas NV	1 year	Bioconc Studies
^{3}H	1mc	EMSL-Las Vegas NV	2 years	Bioconc Studies
^{14}C	1μc	Bemidji State Univ Bemidji MN	1¼ years	Bioconc Studies
--	N/A	NTS-Las Vegas NV	3 years	Field Monitor for Radiation Studies & Atomic Bomb Tests

0927

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Environmental Research Laboratory-Duluth, Duluth, Minnesota 55804

SUBJECT: Designation of New Radiological Health & Safety Officer

DATE: 30 November 1979

FROM: J. David Yount, Ph.D.
Acting Director, ERL-D

TO: SEE BELOW

Effective 17 December 1979 Allan R. Batterman will assume the responsibilities of Radiological Health and Safety Officer.

Addressees

Allan Batterman ✓
Fred Freeman
Philip Cook
Gary Glass
Al Jarvinen
Evelyn Hunt
Bernard Jones
James Mertens
Gilman Veith

EPA Form 1320-6 (Rev. 6-72)

The United States Environmental Protection Agency

Environmental Monitoring and Support Laboratory - Las Vegas

hereby attests that,

Alan R. Batterman

has satisfactorily met the requirements
of the Monitoring Certification Program
and is therefore acknowleged as a

Radiation Monitor

October 1975

D. S. Barth
Director, EMSL-LV

SECTION II: MONITOR TRAINING AND CERTIFICATION PROGRAM OUTLINE

The Radiation Monitor Training and Certification Program, including time requirements, is outlined below. The trainee can begin the program in either Phase I or Phase II, or complete certain areas in each phase. This permits flexibility in arranging and synchronizing formal courses, work requirements, and field training experience.

PHASE I: TRAINING COURSES

Basic Radiological Health	4 days
Environmental Monitoring Techniques	1 day
Field Monitoring Procedures @ the NTS	2 days

PHASE II: FIELD TRAINING

General Field Experience and Operational Procedures	~30 hours
Zone Field Experience	~30 hours

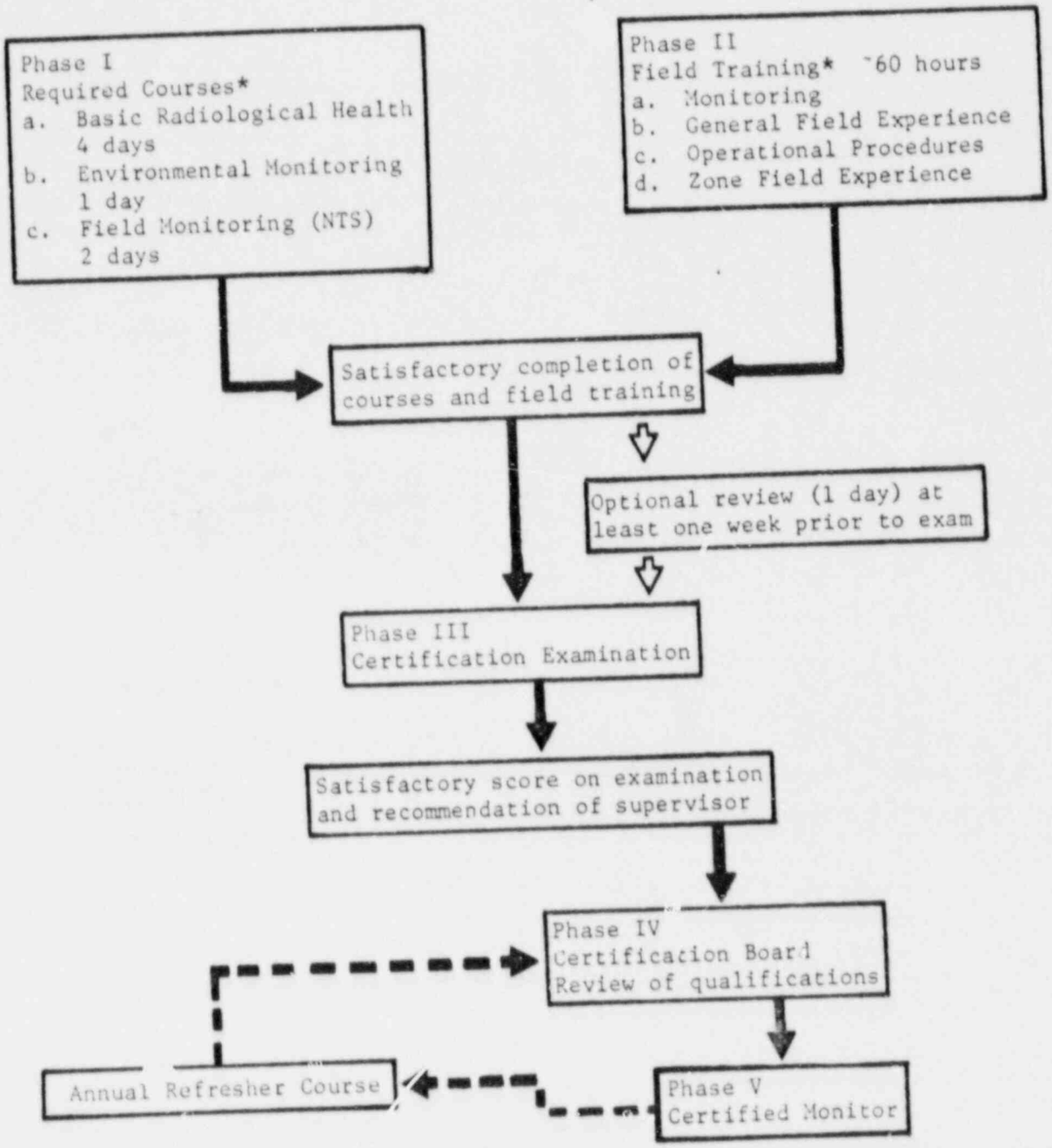
PHASE III: CERTIFICATION EXAMINATION

PHASE IV: REVIEW OF QUALIFICATIONS BY CERTIFICATION BOARD

PHASE V: CERTIFICATION

PHASE VI: ANNUAL REFRESHER COURSE

RADIATION MONITOR TRAINING AND CERTIFICATION PROGRAM



*Personnel who have had formal training or extensive experience in Health Physics or Radiological Health may be excused - at the discretion of the certification board - from all or part of the field training or formal courses. However, in all cases, they will be required to take the certification examination.

SECTION III: REQUIRED TRAINING COURSE DESCRIPTIONS

The required courses provide both the basic academic knowledge of the fundamentals of radiological health, and the practical application of these principles.

BASIC RADIOLOGICAL HEALTH COURSE - 4 days

This course will provide the trainee with basic technical knowledge necessary for radiological health work.

ENVIRONMENTAL MONITORING - 1 day

The trainee will receive specific instruction in NERC-LV operational activities in radiation measurement, sampling procedures, public relations, and test site orientation.

FIELD MONITORING TRAINING - 2 days

Applied training will be given in geographic orientation, field and laboratory monitoring exercises for assessing alpha, beta, and gamma radiation at the Nevada Test Site.

ANNUAL REFRESHER COURSE - 2 days

This course is designed to keep certified monitors abreast of new surveillance techniques and monitoring procedures.

SECTION IV: FIELD TRAINING

During the field training period (approximately 60 hours) the trainee receives individual instructions by a certified monitor. The trainee also demonstrates performance skills and is evaluated on his field monitoring proficiency. The Field Training is divided into four sections:

MONITORING WITH A CERTIFIED MONITOR

The trainee will learn the physical operations carried out by NERC-LV surveillance teams.

GENERAL FIELD EXPERIENCE

Will acquaint the trainee to do work activities performed by monitors in the field.

OPERATIONAL PROCEDURES

Instruction will be given in field sampling techniques, methods of presenting radiological health information, and familiarization with communications procedures.

ZONE FIELD EXPERIENCE

Will consist of geographical orientation to the Nevada Test Site zones and to the off-site areas, as well as the location of off-site sampling stations.

In addition to, or as a substitution for this field training, additional subjects of a more specialized nature may be added in order to meet the requirements of changing program needs.

SECTION V: CERTIFICATION EXAMINATION

After the completion of both Phase I (classroom instructions) and Phase II (field training), and upon the recommendation of their supervisor(s), all monitor trainees will be required to take a final examination. This examination, covering both the theoretical and practical aspects of the certification program, will be prepared, administered, and scored by a Board Appointed Training Staff. The results of this examination will be submitted to the Certification Board for use in the evaluation of the monitor trainees.

Allan R. Batterman, the newly designated Radiation Safety Officer, is to be given additional training as requested. However, to date an acceptable course has not been found and travel restrictions prohibit attendance in FY80.

Rockwell International has a course available 1-3 December 1980 that will probably be selected but no commitment has been made at this time.

SUPPLEMENT D

(A) Element & Mass Number	(B) Chemical and/or Physical Form	(C) Name of Manufacturer and Model Number	(D) Number of Millicuries	(E) Use
C-14, H-3	Labeled organic compounds	N/A	500 mCi each to a maximum of 500 mCi total	To be used in lab research for toxicity metabolism & analytical chemistry of water pollutants, and in sealed containers in the field for measurement of primary prod.
Any with Atomic Number 3-83	Labeled compounds	N/A	200 mCi each to a maximum of 500 mCi total	Same as above
Any with Atomic Numbers 3-83 Ra226	Sealed sources	Nuclear Chicago Model #184100	max 5 µCi total or 5 sources	Instrument calibration
H-3	Foils	N/A	Max 250 mCi per foil with a maximum of 10 foils	For use in gas chromatographs for sample analysis
Ni-63	Sealed sources	Tracor Model #111019-0001 Perkin Elmer Model #069712 Hewlett-Packard Model #18713A	Max 15 mCi per sealed source with a maximum of 25 sources	Same as above

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Environmental Research Laboratory-Duluth, 6201 Congdon Boulevard
Duluth, Minnesota 55804

SUBJECT: Procedures for Toxic Substances Inventory Control DATE: February 7, 1978

FROM: J. David Yount, Ph.D.
Deputy Director
ERL-Duluth, Duluth, MN J. David Yount

TO: ERL-Duluth Staff

OR&D has implemented an interim procedure for toxic substance inventory control at all OR&D laboratories. The purpose is to provide maximum safety for laboratory personnel and visitors while maintaining the capability to conduct necessary research involving known compounds. This procedure complements and extends the statement on Policy and Procedures for Control of Toxic Substances in Air and Water Discharged from Test Systems, dated February 3, 1978.

It is the responsibility of each employee to read this material and to know the procedures described herein. It is the responsibility of each employee to cooperate fully with the Toxic Substance Control Officer (TSCO), Mr. Donald T. Olson, in the implementation and in the carrying out of all aspects of this program.

The Section Chiefs at ERL-Duluth and the Branch Chiefs at the field stations have the ultimate responsibility for seeing to it that this policy is adhered to by their subordinates. Field Station Chiefs are also responsible for instituting Toxic Substance Inventory Control Procedures specific to their facility.

The following procedures will be followed at ERL-Duluth for the compounds listed in Attachment 1 "Interim OR&D Procedure, Toxic Substance Inventory Control."

(1) All compounds in quantities greater than specified in Attachment 1 will be stored and dispensed (all weighing, measuring, and dilution procedures) in the designated controlled access rooms, which are the Hazardous Chemical Storage Room on the loading dock, and Room 218. Compounds stored in Room 218 will be in locked cabinets and locked refrigerators. The key to the Hazardous Chemical Storage Room will continue to be held by Mr. Klovstad. Keys to Room 218 and storage cabinets therein will be held only by authorized persons. The TSCO will maintain a list of authorized persons and a sign-in/sign-out sheet in these rooms as required by the OR&D interim procedures.

(2) The TSCO is required to approve procurement requests for listed substances*, inspect and log in listed substances as they are delivered or brought in by scientific investigators, deliver listed substances to the appropriate controlled access room, provide a running inventory sheet and a toxic substance data sheet for each compound, make a quarterly inventory of all listed substances, insure proper disposal and maintain

disposal records, post signs which identify the controlled access rooms, and label containers containing stock and disposed listed substances.

Substances which are covered by the Toxic Substances Inventory Control procedure are as follows:

(1) The EPA List of Toxic Substances for OR&D Laboratories, Controlled Toxic Substances Lists A and B, and

(2) The National Cancer Institute Listing of Laboratory Carcinogens, some of which are in (1) above. These were added on the recommendation of the Health and Safety Committee, January 4, 1978.

(3) The following additional compounds:

Phenanthrene
Fluoranthene
1-Methyl-naphthalene
Dibenzofurane
Vinylidene chloride

The guidelines from OR& D are interim procedures which will be changed when appropriate. These procedures outlined here for implementation at ERL-Duluth are therefore in some respects temporary and will be modified as appropriate, based on experience and changes in guidance from OR&D. Your careful adherence to this policy is imperative to our individual interests and to the best interests of the laboratory. Thank you for your cooperation and assistance.

Enclosures:
Attachment 1 "Interim OR&D Procedure,
Toxic Substance Inventory Control"
Policy and Procedure for Control of
Toxic Substances in Air and Water
Discharged from Test Systems,
dated 2/3/78
National Cancer Institute's Listing
of Laboratory Carcinogens

*The procurement agent will not process procurement requests for listed chemicals unless the TSCO has approved them.

cc: LLRS, Grosse Ile, MI
MERS, Monticello, MN
NFTS, Cincinnati, OH
Ms. Mildred H. Medlin, Procurement Agent, ERL-Duluth

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Environmental Research Laboratory-Duluth, 6201 Congdon Boulevard
Duluth, Minnesota 55804

SUBJECT: Policy and Procedure for Control of Toxic Substances in Air and Water Discharged from Test Systems

DATE: February 1, 1977
REVISED: February 3, 1978

FROM: B. R. Jones BRJ
Chief, Research Branch
ERL-Duluth, Duluth, MN

TO: RESEARCH BRANCH STAFF

This memorandum supersedes the memorandum on this subject dated February 1, 1977 titled Measurement of Laboratory Water and Air Concentrations of Toxic Substances.

It is a policy of the Environmental Research Laboratory-Duluth that there will be a minimum health hazard from toxic substances in laboratory work areas; that none or the lowest possible concentration of toxic substances will be discharged from the laboratory; and that there will be no discharge from the laboratory of water or air concentrations of toxic substances which exceed established criteria or standards.

To carry out this policy the potential hazards to health of employees and to the environment must be assessed for each substance used or studied in the laboratory.

The investigator's responsibility in regard to this policy is as outlined below for all tests conducted at ERL-Duluth. Assistance is available from Mr. Olson (Toxic Substance Control Officer - TSCO), Mr. Freeman (Facilities Chief and Safety Officer), and Mr. Syrett (Senior Technician, Research Branch). The investigator is responsible for:

1. Estimates of toxicant concentrations in air and waste water leaving the pretreatment unit (based on literature or pilot runs). This is to be provided to the Toxic Substance Control Officer for his entry on the safety review sheet.

2. Testing volatile toxicants in rigid test system enclosures of approved design.

3. Pretreatment of air discharged from test system enclosures to reduce the amounts of toxic substances in exhaust air to the lowest levels reasonable and attainable.

4. Pretreatment of waste water (including cleaning water and excess stock solution not otherwise detoxified) as it leaves the test system to reduce the amounts of toxic substances in waste water to the lowest levels reasonable and attainable.

5. Recording in the test log book, along with test data:

   a. Results of routine measurements before and after the pretreatment unit of amounts of toxic substances discharged in test system waste water; the analyses of waste water to be made on the same schedule as analyses of a given test water concentration.

   b. Results of routine measurements of amounts of toxic substances in the air exhausted from the test system enclosure before and after treatment as may be required for the substance in use; the measurements of air concentrations to be made weekly or on a schedule determined by the TSCO who will do the sampling.

   c. The above results shall be available to the TSCO at all times and shall be reported to the TSCO monthly (at conclusion of short tests) in writing. The TSCO will report monthly to the Deputy Director and Research Branch Chief.

6. Disposal via the TSCO of all hazardous wastes including contaminated filter media, solutions, solids, excess stock solutions, etc., from test systems and laboratories into appropriate waste barrels in the hazardous waste storage area. Contact the TSCO for specific procedures.

For nonrecoverable waste acids and solvents discharged to sewers and the atmosphere from chemistry laboratories, the quantities will be estimated by the Chairman of the Chemistry Committee quarterly and reported by him to the Toxic Substance Control Officer.

The Section Chief is responsible for the implementation of all details of these procedures by his staff and by guest scientists assigned to his section and is responsible for seeing to it that all of his section members understand this policy.

The above procedures for implementing this policy were formulated from the thoughts of a number of people. They represent the best approach seen at this time but are subject to modification based on experience. Careful adherence to this policy is consistent with the philosophy, intent and interests expressed by you. Thank you for your cooperation and assistance.

cc: Dr. D. I. Mount
Dr. J. D. Yount
Dr. W. A. Brungs
Dr. K. E. Biesinger
Dr. W. A. Spoor
Dr. R. G. Rowe
Mr. R. F. Syrett
Mr. F. B. Freeman
Dr. G. E. Glass
Mr. D. T. Olson
Mr. J. H. McCormick, Chairman, Bioassay Committee
Mr. E. N. Leonard, Chairman Chemistry Committee

SUPPLEMENTARY SHEET F (a)

Item #12 - Radiation Exposure - ALARA

This concept is practiced in all our research work at ERL-D and its field stations. Laboratory policy (see attached memos "Procedures for Toxic Substances Inventory Control" dated 7 February 1978; "Policy and Procedures for Control of Toxic Substances in Air and Water Discharged from Test Systems" dated 3 February 1978; and "Procedures for Toxic Substances Inventory Control and Toxic Substances Disposal at ERL-D" dated 13 February 1979) states the Concept of ALARA for all work and this practice is understood to extend to any isotope work. The RSO takes over where the TSCO would normally work and only the RSO has the keys to the Radioisotope Storage. Whole body exposure of monitored personnel at our laboratory has not exceeded 0.25 REM for any individual employee.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Environmental Research Laboratory-Duluth, Duluth, Minnesota 55804

0927

SUBJECT: Procedures for Toxic Substances Inventory Control and Toxic Substances Disposal at ERL-Duluth

DATE: 13 February 1979

FROM: J. David Yount, Ph.D.
Deputy Director, ERL-D

TO: ERL-D Staff

THRU: James R. Mertens
Toxic Substances Control Officer (TSCO)

This procedure will update and integrate "Procedures for Toxic Substances Inventory Control", dated 7 February 1978; and "Policy and Procedure for Control of Toxic Substances in Air and Water Discharged from Test Systems", dated 3 February 1978.

It is the responsibility of ERL-D to provide maximum safety for the laboratory staff, visitors to ERL-D, and the surrounding community. Therefore, it is the policy of ERL-D to minimize the health hazard from exposure to toxic substances in the laboratory environment and to minimize the amount of toxic substances discharged from the laboratory. These procedures are also a necessary part of our compliance with the "Memorandum of Understanding" between ERL-D and the MPCA and with proposed federal regulations governing hazardous w[illegible] disposal.

It is each employee's responsibility to read and understand these procedures. It is the supervisor's responsibility to ensure that these procedures are understood and complied with. Full cooperation with the TSCO is also necessary for the implementation of this program.

I believe that these procedures will not overly restrict the researchers. In order for them to work, however, they must be followed to the letter. If exceptions appear to be called for by particular circumstances, only the TSCO has the authority to approve these exceptions. The investigator should check with his/her supervisor if an exception seems to be indicated. If the supervisor agrees, then the TSCO approval should be requested. No work should begin without TSCO approval.

A. The following procedures will be adhered to for all work with "controlled" chemicals listed in Attachment 1, "Interim OR&D Procedure, TSIC" and other chemicals which will be added to the list in the future (see TSCO for list):

1. All chemicals on the list in quantities greater than specified must be stored and dispensed in Room 218, the hazardous chemical storage room. All weighing, measuring and dilution will be done in the glove box. All chemicals will be stored in locked cabinets and refrigerators. Keys for the storage cabinets and refrigerator will be held by the TSCO. Keys for Room 218 will be held by the TSCO and at the guard desk. The TSCO will maintain a list of persons who are authorized to use Room 218. These persons must have received orientation training by the TSCO.

2. Each person entering Room 218 must sign in and out in the log book as required by the "Interim OR&D Procedures." The TSCO will maintain a data and inventory sheet for each of the listed compounds. Any person removing any amount of one of the listed compounds will log the amount dispensed on the inventory sheet.

3. The TSCO is required to approve procurement requests for all chemicals, inspect and log in listed chemicals as they are delivered to the lab or brought in by scientific inventigators, deliver listed chemicals to Room 218 and make a quarterly inventory of all listed chemicals. The TSCO must be notified before listed chemicals are placed in Room 218.

4. The TSCO will ensure of proper disposal of listed chemicals, maintain disposal records, keep records of pretreatment of air and water discharged from test systems and label all waste containers of listed substances.

B. Procedures for other toxic chemicals not listed for inventory control:

1. Other chemicals not controlled by Section A, are also recommended for storage in Room 218. The TSCO should be notified of any such chemicals which are to be stored in Room 218. Sign-in/sign-out procedures will be followed when entering Room 218 to dispense chemicals covered by this section. Any person removing any amount of such chemicals will log the amount dispensed on an inventory sheet.

2. The TSCO will maintain an inventory of all chemicals covered by this section and stored in Room 218, post lists of all chemicals stored in Room 218, and ensure proper disposal of these chemicals.

C. Reporting procedures for control of toxic substances in air and water discharged from test systems---The investigator's responsibility in regard to this policy is as outlined below for all tests conducted at ERL-D. Assistance is available from James Mertens (Toxic Substances Control Officer-TSCO), Fred Freeman (Facilities Chief and Safety Officer), and Roll Syrett (Senior Technician, Research Branch). The investigator is responsible for the following:

1. Preparing a work plan which includes pertinent information on conditions under which the chemical(s) will be used and a safety review sheet for the work plan. No research work shall be done at the ERL-D facility unless the work plan and safety review sheet have been prepared and approved.

2. Estimates of toxicant concentrations in air and waste water leaving the pretreatment unit (based on literature or pilot runs). This is to be provided to the TSCO for his entry on the safety review sheet.

3. Testing volatile toxicants in rigid test system enclosures of approved design.

4. Pretreatment of air discharged from test system enclosures to reduce the amounts of toxic substances in exhaust air to the lowest attainable levels.

5. Pretreatment of waste water (including cleaning water and excess stock solution not otherwise detoxified) as it leaves the test system to reduce the amounts of toxic substances in waste water to the lowest levels reasonable and attainable.

6. Recording in the test log book, along with test data the following:

   a. Results of routine measurements before and after the pretreatment unit of amounts of toxic substances discharged in test system waste water; the analyses of waste water to be made on the same schedule as analyses of a given test water concentration.

   b. Results of routine measurements of amounts of toxic substances in the air exhausted from the test system enclosure before and after treatment as may be required for the substance in use; the measurements of air concentrations to be made on the same schedule as analyses of a given test water concentration (see TSCO for sampling).

   c. The above results shall be available to the TSCO at all times and shall be reported to the TSCO monthly (or at the conclusion of shorter tests) in writing. The TSCO will report monthly to the Deputy Director and Research Branch Chief.

7. Disposal via the TSCO of all hazardous wastes including contaminated filter media, solutions, solids, excess stock solutions, etc., from test systems and laboratories into appropriate waste barrels in the hazardous storage area. Contact the TSCO for specific procedures.

cc: MPCA, Roseville MN
William Horning (NFST)
Jack W. Arthur (MERS)
Wayland Swain (LLRS)
Mildred Medlin (Purchasing Agent)