

AID IN COMPLETING APPLICATION FOR RADIOACTIVE MATERIAL LICENSE - LABORATORY

The department has created this application form to be self-explanatory. Using the provided application form, fill in the blanks, check the appropriate boxes, and attach additional information as requested. Equivalent procedures may be submitted in place of the standard attachments found in the application. The appendices should be numbered according to the corresponding item number in the application. All information must be submitted on 8 1/2" x 11" paper. Please sequentially number all pages in the application package.

Checking your work: Have you forgotten anything?

- Have you included the street address, telephone number, Fax number, and E-mail address of the facility?
- Did you include the name and phone number of the contact person?
- Are you sure the sealed sources (if any) match the devices according to manufacturer's data?
- Have you checked all the appropriate boxes, and filled in all required blanks?
- Have you completed and included all the requested attachments?
 - ~ Attachment A - Training and Experience for RSO and each authorized user
 - ~ Attachment B or equivalent - Delegation of authority and Duties of the Radiation Safety Officer
 - ~ Delegation of authority for the Radiation Safety Officer from a member of senior management
 - ~ Attachment C or equivalent procedures if performing calibrations on own instruments
 - ~ Facilities and storage diagrams
 - ~ Facilities and equipment descriptions
 - ~ Attachment D or equivalent - Standard Survey Criteria and Procedures
 - ~ Detailed leak test counting procedures (unless an approved service agency is used)
 - ~ Attachment E - Records Required
 - ~ Sample of each record form
 - ~ Attachment F or equivalent instructions - Personnel Training Program
 - ~ Attachment G or equivalent lab safety rules - General Rules for Safe Use
 - ~ Attachment H or equivalent procedures - Waste Disposal
 - ~ Attachment I or equivalent procedures - Emergency Procedures
 - ~ Attachment J or equivalent procedures - Ordering and Accepting Delivery of Packages
 - ~ Attachment K or equivalent procedures - Opening Packages
 - ~ Attachment L - Air Emissions Questionnaire
 - ~ Detailed bioassay program and procedures (if applicable)
 - ~ Detailed radiation safety procedures for working with lab animals (if applicable)
 - ~ Detailed radiation safety procedures for human use (if applicable)

- If this is a new application, have you enclosed the one time application fee in addition to the licensing fee?

- Has the form been signed and dated by senior management (the RSO may sign only if senior management has filed a statement authorizing the RSO to sign all applications and radiation safety program commitments with the Department.)



Application for Radioactive Material License Laboratory

Instructions – Complete all items in this application for a new license **or** the renewal of an existing license. Use supplemental 8 1/2 “x 11” sheets where necessary. Prepare the application package in accordance with the directions contained in the application cover letter. **Item 23 must be completed on all applications.** Mail the completed original application package to:

US _____ Mail: _____ Physical Department of Health Department Office of Radiation Protection Radioactive Materials Section Post Office Box 47827 Olympia, Washington 98504-7827	_____ Location: _____ of Health Office of Radiation Protection Radioactive Materials Section 111 Israel Rd SE, TC-2 Tumwater, Washington 98501
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Upon approval of this application, the applicant will receive a State of Washington Radioactive Materials Specific License issued in accordance with the general requirements contained in [Title 246](#) WAC “Department of Health, Rules and Regulations for Radiation Protection”, and [Chapter 70.98](#) RCW “Nuclear Energy and Radiation”.

1. A. Applicant Name and Mailing Address Include Zip Code + 4 (Institution, Firm, Individual owner, etc.)	1. B. Address(es) at which Radioactive Material Will Be Used Include Zip Code + 4 <input type="checkbox"/> same as Item 1.A)
2. A. Person to Contact Regarding this Application	2. B. Contact Person: Telephone No. () _____ - _____ Fax Number () _____ - _____ Email Address _____ Website Address _____
3. This is an Application for: (check Appropriate item) A. <input type="checkbox"/> New License B. <input type="checkbox"/> Renewal of License No WN-_____	
4. A. Authorized Users (Attach a list of the names of individuals who will independently use or directly supervise the use of Radioactive Material and the specific type of material they are to be authorized for.)	4. B. Training and Experience <input type="checkbox"/> Attachment A completed and attached for RSO and <u>each</u> authorized user
5. A. Radiation Safety Officer (RSO) (Name of person designated as Radiation Safety Officer.) Name _____ Telephone No. () _____ - _____ Fax Number () _____ - _____ Email Address _____	5. B. Duties of Radiation Safety Officer <input type="checkbox"/> Delegation of authority completed, signed by corporate management and attached And (Check one) <input type="checkbox"/> Attachment B completed, signed, and attached or <input type="checkbox"/> Equivalent duties signed and attached

6. Radioactive Material (Element and mass number of each.)	7. Chemical and/or Physical Form (liquid, solid, gas, bound or unbound), or Sealed Source Manufacturer and Model Number	8. Maximum Possession Limit (maximum activity the licensee will possess at any one time in mCi)	8. A. Annual Possession Quantity (amount of all activity, including waste, possessed in one year, in mCi)
A. _____	A. _____ _____	A. _____ mCi	A. _____ mCi
B. _____	B. _____ _____	B. _____ mCi	B. _____ mCi
C. _____	C. _____ _____	C. _____ mCi	C. _____ mCi
D. _____	D. _____ _____	D. _____ mCi	D. _____ mCi
E. _____	E. _____ _____	E. _____ mCi	E. _____ mCi

9. Use and/or Device Description (Lettering should correspond to lettering in Items 6, 7, and 8 above.) Provide a brief description of use, or for sealed source, device in which source is used.	
A.	
B.	
C.	
D.	
E.	

<p>10. Use</p> <p>A. Human Use: (check one)</p> <p><input type="checkbox"/> Not applicable</p> <p><input type="checkbox"/> Detailed radiation safety procedures attached (including waste disposal).</p> <p>B. Animal Use: (check one)</p> <p><input type="checkbox"/> Not applicable</p> <p><input type="checkbox"/> Detailed radiation safety procedures attached (including waste processing and disposal).</p> <p>11. Handling Procedures (attach a complete description for each nuclide)</p> <p>Include:</p> <ul style="list-style-type: none"> • Activity Per Order • Order Frequency • Exposure Reducing Equipment • Protective Clothing • Radiation Safety Protocols • Disposal Protocols 	<p>12. Instructions to Personnel</p> <p>A. Personnel Training: (check one)</p> <p><input type="checkbox"/> Attachment F completed, signed, and attached <i>or</i></p> <p><input type="checkbox"/> Equivalent instructions to personnel attached</p> <p>B. Lab Safety Rules: (check one)</p> <p><input type="checkbox"/> Attachment G completed, signed, and attached <i>or</i></p> <p><input type="checkbox"/> Equivalent lab safety rules attached</p>
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13. Personnel Monitoring (check as appropriate)

Personnel Dosimetry Provided

A. Vendor: (each vendor must be NVLAP certified)

Name _____

B. Type:

- | | |
|---|--|
| <input type="checkbox"/> <u>Extremity</u> | <input type="checkbox"/> <u>Whole Body</u> |
| <input type="checkbox"/> Beta-Gamma | <input type="checkbox"/> Beta-Gamma |
| <input type="checkbox"/> Neutron | <input type="checkbox"/> Neutron |
| <input type="checkbox"/> TLD/ OSL | <input type="checkbox"/> TLD/ OSL |
| <input type="checkbox"/> Film | <input type="checkbox"/> Film |

C. Whole Body Exchange Frequency:

- Monthly Quarterly

D. Storage Requirements: (required)

- Controls and Dosimeters not in active use shall be stored in cool, dry place away from radiation sources.

- Exemption from Personnel Dosimetry Requirement Requested** (must attach justification for request and records of prior dose history)

13. Personnel Monitoring *continued* (check as appropriate)

Bioassay Program

Type:

- I-125, I-131 H-3 Other _____
 N/A

- Bioassays shall be performed by an approved service vendor. List vendor:

Name _____

Address _____

License Number _____

OR

- Applicant will perform bioassays detailed procedures must be signed and attached

14. Radiation Detection Instruments List radiation detection instruments possessed. (Instruments Required by the department: pancake probe for beta emitters; liquid scintillation counter (LSC) for H-3, C-14, and S-35; low energy gamma (LEG) scintillation probe for I-125; ion chamber for high-energy gamma emitters.)

Manufacturer	Make/ Model #	Probe Model #	Range	Radiation Type Detected	Efficiency (specify nuclide)	Type of Use

15. Instruments (required for all instruments possessed)

A. Calibration Frequency:

- Annually and after each repair

B. Calibrations: (check one)

- Calibration shall be done by an approved calibration service vendor. List vendor:

Name _____

Address _____

License Number _____

- Applicant will do instrument calibrations
 Detailed procedures and Attachment C signed and attached (see application guide for Attachment C)

C. Instrument Operational Checks: (required prior to each use)

<u>Instrument</u>	<u>Check Source</u>
_____	_____
_____	_____

16. Survey Program (check one)

- Attachment D completed, signed, and attached
or
 Equivalent detailed procedures signed and attached

17. Ordering and Receiving Packages (check one)

- Attachment J completed, signed, and attached
or
 Equivalent detailed procedures signed and attached

18. Opening Packages (check one)

- Attachment K completed, signed, and attached
or
 Equivalent detailed procedures signed and attached

19. Waste Disposal Program (check one)

- Attachment H completed, signed, and attached

And

- Detailed procedures signed and attached

20. Air Emissions (Required for all applicants)

- Attachment L completed and attached
(Based on the values submitted you may or may not have to submit additional information as specified in WAC 246-247-10 Appendix A.)

21. Facilities (all required)

A. Facility Diagrams (NO LARGER than 8 1/2" x 11") indicating locations of :

- Shipping/receiving
- Storage areas
- Use areas
- Waste areas
- Hoods for radioactive materials use/ storage
- Sinks for radioactive materials disposal
- Ventilation system, air exhausts and intakes

B. Security (attach a description of the security methods proposed to assure unauthorized access, including janitorial staff, to radioactive materials in the following areas)

- Shipping/receiving
- Storage areas
- Use areas
- Waste areas

C. Hoods (all required)

- Hoods used for radioactive material are checked annually to verify flow meets the manufacturer's specifications under normal working conditions

- Measurements will be made by:

Name _____

Address _____

22. Sealed Source Leak Test Program

(check one)

- Not applicable.
- Leak test sampling and analysis shall be performed by the approved service vendor listed below.
- Applicant will perform leak test sampling using approved leak test kit; approved vendor listed below will perform leak test analysis.

Vendor Name _____

Vendor Address _____

Vendor License Number _____

- Applicant will perform sealed source leak test sampling and analysis. Detailed procedures signed and attached.

23. Emergency Procedures (check one)

- Attachment I completed, signed, and attached
or
- Equivalent detailed procedures signed and attached

24. Surety and Decommissioning

- Not applicable.
- Statement concerning Surety and Decommissioning as defined in WAC 246-235-075 attached.

25. Emergency Planning

- Not applicable
- Statement concerning Emergency Planning as defined in WAC 246-235-077 attached.

26. License Fee Required

License Fee Category _____ (See WAC 246-254-057)
 New Application Fee Enclosed Yes N/A
 License Fee Enclosed \$ _____
 Total Enclosed \$ _____

Item 27 – CERTIFICATE (This item must be completed by management)

The applicant and any official executing this certificate on behalf of the applicant named in Item one certify that this application is prepared in conformity with Washington State Department of Health, Office of Radiation Protection regulations and that all information contained herein, including any supplements attached hereto, is true and correct to the best of our knowledge and belief. **All deviations from the Department's standard application have been clearly identified.**

(Type or print name of certifying official)

(Signature)

(Title of certifying official)

(Date)

ATTACHMENT A

Training and Experience Authorized User or Radiation Safety Officer

(Use supplemental sheets if necessary.)

1. Name of Applicant			2. Date of Application	
3. Training Received in Basic Radioisotope Handling Techniques				
Subject of Training	Where Training Occurred	Date(s) & Duration	Formal Course	On the Job
A. Principles and Practices of Radiation Protection			<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
B. Characteristics of Ionizing Radiation			<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
C. Units of Radiation Dose and Quantities of Activity			<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
D. Radiation Detection Instrumentation and Monitoring Techniques			<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
E. Biological effects of radiation			<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No

4. Hands-On Experience with Radioactive Materials			
Nuclide	Maximum Amount Used per Experiment	Where Experience was Gained	Date(s) and Duration of Experience

Attachment A: Training and Experience- continued

Name of Applicant:		
5. Resume of Radiation Work Experience		
Dates of Employment	Employer Name/Address Supervisor/ Phone Number	Job Title/Type of Radioactive Materials use including nuclides used

I certify that this attachment is prepared in conformity with Washington State Department of Health, Office of Radiation Protection regulations and that all information contained herein, including any supplements attached hereto, is true and correct to the best of my knowledge and belief.

(Signature)
7 of 24

(Date)

ATTACHMENT B

Duties of the Radiation Safety Officer

The Radiation Safety Officer shall:

1. Assure that all uses of radioactive material are:
 - a. Conducted safely,
 - b. Adhere to the conditions of the license and license application, and
 - c. Result in exposures to personnel which are as low as reasonably achievable (ALARA).
2. Assure the radioactive material possessed by the licensee is limited to the types and possession quantities authorized by the license.
3. Be familiar with all applicable state and federal regulations, and regulatory guides and standards.
4. Act as liaison agent with regulatory authorities, be available for assistance during inspections and audits, and notify the Department:
 - a. In writing before making any changes which would render the Application for Radioactive Materials License, or Radioactive Materials License no longer accurate,
 - b. Immediately in the event of any radiation accident or incident (including high dosimeter reading),
 - c. Within five (5) days of any positive leak test result of a sealed source, and/or
 - d. Within thirty (30) days submit a report stating remedial action taken after accident or incident.
5. Assure that radioactive materials are used only by or under supervision of individuals authorized by the license.
6. Assure that radioactive materials are properly secured against access by unauthorized persons and/or unauthorized removal.
7. Maintain a running inventory of all radioactive material possessed under the license, including radioactive waste.
8. Assure that a semi-annual inventory of all sealed sources possessed by the licensee is performed.
9. Post "Notice to Employees" RHF-3 and notices of items of noncompliance resulting from Department inspections conspicuously, in an area where users of radioactivity will see them.
10. Assure that radiation workers are instructed in and have documented training in radiation safety rules, procedures and the ALARA program, including:
 - a. Prior to working with radioactive material,
 - b. With each change in license condition or in the safety program, and
 - c. Annually in a refresher course.
11. Train ancillary staff commensurate with duties, including posting and emergency procedures, see attachment F, item #2.
12. Assure that individuals working with radioactive materials have appropriate protective devices, including shielding, ventilation, clothing, gloves, remote handling equipment (where necessary), and facilities which aid in keeping exposures As Low As Reasonably Achievable (ALARA).

Attachment B- continued.

13. Perform a quarterly review of occupational doses to workers to determine if the doses are within the limits established for the ALARA program.
14. Perform an annual review of the radiation safety program, including adherence to the ALARA concepts and to make sure that the radiation safety program is followed by all workers dealing with radioactive materials.
15. Advise occupational workers of each high dose report, and conduct a survey to determine the cause of all overexposures so as to preclude reoccurrence.
16. Provide occupational workers documentation of their annual accrued dose from internal and external exposures.
17. Supply terminated occupational workers with radiation dose records as required by regulation.
18. Procure and maintain an adequate number of operable and properly calibrated radiation survey instruments/ counting equipment, of the appropriate range and type.
19. Assure all surveys, calibrations, and leak tests are performed on time.
20. Assure that all incoming and outgoing radioactive shipments are properly packaged and labeled according to DOT requirements, and that shipments are accompanied by proper shipping papers.
21. Assure that radioactive materials are disposed of properly.
22. Establish and maintain record systems as applicable for:
 - a. Radiation area surveys,
 - b. Leak tests,
 - c. Instrument Calibrations,
 - d. Personnel dosimeter reports,
 - e. Receipts of incoming radioactive material,
 - f. Surveys of incoming and outgoing radioactive material shipments,
 - g. Radioactive materials use and inventory,
 - h. Radioactive waste disposed,
 - i. Personnel training, and
 - j. Audits, incidents, and ALARA reviews.
23. Develop and maintain up-to-date operating and emergency procedures.
24. Take charge in all emergency situations (spills, or release of radioactive material, etc.) to make sure correct protection procedures and emergency decontamination procedures are carried out.
25. Investigate and implement corrective actions for incidents.
26. Investigate any deviations from the radiation safety program and take remedial action as necessary.
27. Apprise and inform management of radiation safety status and their responsibilities in maintaining an adequate radiation safety program.

RSO Signature _____ Date _____

Delegation of RSO Authority

Memo To: Radiation Safety Officer _____

From: Chief Executive Officer _____

Subject: Delegation of Authority

You, _____, have been appointed Radiation Safety Officer and are responsible for ensuring the safe use of radiation. You are responsible for managing the radiation protection program; identifying radiation protection problems; initiating, recommending, or providing corrective actions; verifying implementation of corrective actions; stopping unsafe activities; and ensuring compliance with regulations and conditions of the radioactive materials license. You are hereby delegated the authority necessary to meet those responsibilities, including prohibiting the use of radioactive material by personnel who do not meet the necessary requirements, and terminating operations where justified by radiation safety. You are required to notify management if staff do not cooperate and do not address radiation safety issues. In addition, you are free to raise issues with the Washington State Department of Health Office of Radiation Protection at any time. It is estimated that you will spend _____ hours per week conducting radiation protection activities.

I accept the above responsibilities,

Signature of Management Representative

Signature of Radiation Safety Officer

Management Representative Printed Name

Radiation Safety Officer Printed Name

Job Title of Management Representative

Job Title of Radiation Safety Officer

Date

Date

cc: Affected administrators / department heads as appropriate.

ATTACHMENT D

Standard Survey Program for Unsealed Radioactive Material

1. A reference check source of long half-life, e.g., Cs-137 or Ra-226, shall be read and recorded at the time of the initial receipt of the instrument or as soon as the instrument is received from calibration. The readings shall be taken with the check source placed in specific geometry relative to the detector. A reading of this reference check source shall be taken before each survey, and after each maintenance and/or battery change. If any reading using the same geometry is not within ± 20 percent of the reading measured immediately after calibration, the instrument must be re-calibrated.
2. A documented survey shall be performed in all use areas on a weekly basis unless they meet one of the criteria below. Any room meeting these criteria may be surveyed monthly.
 - A. A room, such as a counting, equipment, or autoradiograph room, where all material is contained and unopened.
 - B. Waste storage areas which are accessed infrequently (once a month or less).
3. Daily or after use, surveys will be done of clothing, hands, feet, and work areas when working with any nuclide with the exception of tritium only, using an appropriate low range instrument. After-use surveys will be done if a spill is suspected for all nuclides. Documentation of these surveys is not required, unless contamination is found to be present at levels more than two times background on a hand held instrument, or 1000 dpm per 100 cm² for beta or gamma or 20 dpm per 100 cm² for alpha on Liquid Scintillation or other precision count instrumentation.
4. All surveys will consist of:
 - A. A direct measurement of radiation levels or contamination levels with an appropriate survey meter sufficiently sensitive to the nuclides used in the area. This measurement is not required or sufficient for low energy beta emitters such as tritium, carbon 14, or sulfur 35.
 - B. A series of wipe tests to measure removable contamination level. The method for analyzing wipe tests must be sufficiently sensitive to detect 1000 dpm per 100 cm² for beta or gamma or 20 dpm per 100 cm² for alpha. If you are using a portable instrument to measure the wipes, go to a low background area to count the wipes. Liquid Scintillation or an approved sufficiently sensitive detection instrument shall be used for tritium, carbon 14 and sulfur 35.
5. For all required documented surveys, a permanent record will be kept of all survey results, including negative results. The records shall include:
 - A. Location, date, and person doing the survey.
 - B. Identification of equipment used, including serial number and pertinent counting efficiencies.
 - C. Drawing of the area surveyed, identifying relevant features such as storage areas, waste areas and major use areas. Also include numbered locations corresponding to the places surveyed.
 - D. Measured exposure or count rates, keyed to locations on the drawing.
 - E. Results of surveys for removable contamination, keyed to locations on the drawing.
 - F. A background reading for the portable instrument and the results of a blank wipe for non-portable counters.
 - G. Corrective action taken when survey results exceed action levels.
6. Action level for direct survey and contamination surveys will be two times the background reading in an area with no radioactive material present or two times the reading on the blank wipe.

Approved by:

Date

ATTACHMENT E

Records Required for Laboratory Licenses

Laboratory and industrial radioactive material licensees are required to maintain a number of records. This form is designed to simplify your task of complying with the regulations in regard to record keeping. The different record requirements are listed below in the order they appear in WAC 246. It is your responsibility to develop your own records and make sure that all required records are accounted for.

Because the RHF-1LI Application Form is used for a wide variety of laboratory and industrial applications, ranging from small laboratories to large scale industrial uses of radioactive materials, this attachment may list a number of records which may not apply to all users. If a record described in the attachment is for some material or equipment that you will not have, write N/A in the space to the right of the records description. If the need for a particular record would arise only rarely, you need not compose a special form for that record, but may document the required information by letter or memo.

Provide a copy of all records used.

Section of WAC	Type of Records	Form Code No. or Form Name.
246-220-020 (1) w	General provisions require records of receipt, use, storage, transfer, and/or disposal of radiation sources. (use logs, purchase orders, waste logs, etc.)	_____
246-233-020 (4) (c) (iv)	For licensees with generally licensed gauges, maintain records of tests for leakage of radioactive material and proper operation of the on-off mechanism or indicator in compliance with WAC 246-233-020 (4) (c) (ii) and (iii).	_____
246-221-080 (2)	Records of sealed source leak tests.	_____
246-221-090 (2) (d) monitori	Record of exposure circumstances of personnel using device when it was not worn.	_____
246-221-110 contami	Records of surveys preserved as specified in WAC 246-221-230 (this includes receipt surveys, contamination surveys, etc.)	_____
246-221-190 se	Records of disposal by release into sanitary sewer systems proving compliance with limits in WAC 246-221-190. (sink disposal forms/logs)	_____
246-221-230 (7) contai bad	Records of radiation exposures on RHF-5A or all other forms containing all the information required by form RHF-5A.	_____ (this information is usually needed in vendor's dosimetry exposure reports)
246-222-030 Recor	Records of instructions to workers. (copies of training curriculum and training records)	_____

ATTACHMENT F

Personnel Training Program

1. The Radiation Safety Officer or title _____ shall provide yearly documented instruction to radiation workers. Instruction shall include, but is not limited to:

- A. General radioactive materials safety rules:
- B. Personnel monitoring program (e.g., use, exchange, storage, records, and reports):
- C. Radiation and contamination survey program:
- D. Accident, incident, and emergency procedures:
- E. Radioactive materials work procedures:
 - (1) ordering, receipt and opening procedures:
 - (2) storage:
 - (3) use of radioactive materials:
 - (4) waste packaging and storage:
 - (5) transportation procedures.
- F. Applicable state and federal rules and regulations and license conditions.

2. The Radiation Safety Officer or (title) _____ shall provide instruction to ancillary personnel, such as clerical/receptionist, janitorial/custodial, maintenance/facility, shipping and receiving, and security personnel, and visitors whose duties may require them to work in the vicinity of radioactive material. This training shall include, but not be limited to:

- A. All terms of the license pertinent to radiation safety.
- B. Identification of areas where radioactive material is used or stored.
- C. Potential hazards associated with radioactive material.
- D. Radiological safety procedures appropriate to their respective duties.
- E. Pertinent state and federal regulations.
- F. Rules and procedures of the license.
- G. Obligation to report unsafe conditions to the Radiation Safety Officer.
- H. Appropriate response to emergencies or unsafe conditions.
- I. Right to be informed of their radiation exposure and bioassay results.
- J. Locations where the licensee has posted or made available notices, copies of pertinent regulations, and copies of pertinent licenses and license conditions (including applications and applicable departmental correspondence,) as required by WAC 246-222.

The Radiation Safety Officer shall verify that personnel will be properly instructed before assuming duties with, or in the vicinity of, radioactive materials, and whenever there is a significant change in duties, regulations, or the terms of the license. Personnel shall be provided annual refresher training.

APPROVED BY

DATE

ATTACHMENT G

General Rules for Safe Use of Radioactive Material

Check appropriate boxes for items which apply to your facility and which you will institute.

- 1. Wear laboratory coats or other protective clothing at all times in areas where dispersible radioactive materials are used.
- 2. Wear disposable gloves at all times while handling dispersible radioactive materials.
- 3. Monitor hands and clothing for contamination after each procedure or before leaving the area.
- 4. Use shielding devices and/or remote tools when working with millicurie or greater quantities of radioactive materials.
- 5. A. Do not eat, drink, smoke, or apply cosmetics in any area where radioactive material is stored or used.
B. Do not store food, drink, or personal effects with radioactive material (e.g., in refrigerator).
- 6. Wear personnel monitoring devices (film badge or TLD) at all times while in areas where radioactive materials are used or stored. These devices should be worn at chest or waist level. Personnel monitoring devices when not being worn to monitor occupational exposures should be stored in a designated low background area.
- 7. Wear TLD finger badges when manipulating millicurie or greater quantities of radioactive materials.
- 8. Dispose of radioactive waste only in specially designated drains or properly shielded receptacles.
- 9. Never pipette by mouth.
- 10. Survey laboratory work area for contamination after each procedure, or at the end of the day. Decontaminate if necessary.
- 11. Confine radioactive solutions in covered containers plainly identified and labeled with name of compound, radionuclide, date, activity, and radiation level, if applicable.
- 12. Always transport radioactive material in shielded containers.
- 13. Use remote tools when handling sealed sources.
- 14. Keep all radioactive liquids in secondary containment.

APPROVED BY DAT

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ATTACHMENT H

Waste Disposal

1. Liquid waste (other than liquid scintillation cocktail) will be disposed of (check as appropriate)
- In the sanitary sewer system in accordance with WAC 246-221-190, complete Item 5 below.
Note: septic systems do not qualify.
 - Disposed of by commercial waste disposal service, complete Item 4 below.
 - Other (specify) _____
 - Held for decay (radioactive material with a physical half-life of **less than 120 days ONLY**) before disposal in ordinary trash. Material will be held until radiation levels, as measured in a low background area with a low-level survey meter and with all shielding removed, have reached levels indistinguishable from background levels.
All radiation labels will be removed or obliterated, prior to the waste being disposed of in normal trash in the biological waste stream.
- or

2. Liquid Scintillation Cocktail will be disposed of:
- In sanitary sewerage system in accordance with WAC 246-221-190. Cocktails must be considered non-hazardous waste by Washington State Department of Ecology Regulations, which are more restrictive than the Environmental Protection Agency.
 - By commercial waste disposal service _____
NAME

3. Solid waste will be disposed of (check as appropriate)
- By Return to the manufacturer.
 - Held for decay (radioactive material with a physical half-life of **less than 120 days ONLY**) before disposal in ordinary trash. Material will be held until radiation levels, as measured in a low background area with a low-level survey meter and with all shielding removed, have reached levels indistinguishable from background levels.
All radiation labels will be removed or obliterated, prior to the waste being disposed of in normal trash in the biological waste stream.
- or
- By in-house compaction, describe under Item 15 of application.
 - By commercial waste disposal service, complete Item 4 below. *
 - Other (specify) _____

4. The commercial waste disposal service used will be _____
NAME
- _____
ADDRESS CITY STATE

Radioactive Materials License Number _____

5. Sanitary sewer radioactive material disposal concentration calculation.

A. Determine total volume of sewage per month _____ ml

(Note: The total volume of sewage may be estimated by averaging the volume as stated on the sewage bill or the volume of water used by a facility as stated on a water bill.)

Useful Conversions: 1 cubic foot = 2.832 x 10⁴ ml 1 gallon = 3.78 x 10³ ml

Attachment H - continued

- B. Determine average activity for each nuclide disposed of via the sanitary sewer per month.
(Attach additional sheets as necessary)

Nuclide	Activity	(microcuries per month)
1) _____	_____	_____
2) _____	_____	_____
3) _____	_____	_____
4) _____	_____	_____
5) _____	_____	_____

- C. For each nuclide, divide the activity (microcuries) by the monthly volume (ml).
(Attach additional sheets as necessary)

Nuclide	Activity ÷ Monthly Volume = Monthly Concentration
1) _____	_____ μCi ÷ _____ ml = _____ $\mu\text{Ci/ml}$
2) _____	_____ μCi ÷ _____ ml = _____ $\mu\text{Ci/ml}$
3) _____	_____ μCi ÷ _____ ml = _____ $\mu\text{Ci/ml}$
4) _____	_____ μCi ÷ _____ ml = _____ $\mu\text{Ci/ml}$
5) _____	_____ μCi ÷ _____ ml = _____ $\mu\text{Ci/ml}$

- D. Refer to WAC 246-221-190 and WAC 246-221-290, Appendix A, Table 3 to determine compliance with regulations.

- E. Perform Unity Calculation by dividing the monthly concentration of each nuclide determined in C. by the allowable monthly average concentrations found in the regulations cited in D. Add the sum of the fractions. **Sum of Fractions must be less than or equal to 1.**
(Attach additional sheets as necessary)

Nuclide	Monthly Concentration ÷ Allowable Concentrations = Fraction
1) _____	_____ $\mu\text{Ci/ml}$ ÷ _____ $\mu\text{Ci/ml}$ = _____
2) _____	_____ $\mu\text{Ci/ml}$ ÷ _____ $\mu\text{Ci/ml}$ = _____
3) _____	_____ $\mu\text{Ci/ml}$ ÷ _____ $\mu\text{Ci/ml}$ = _____
4) _____	_____ $\mu\text{Ci/ml}$ ÷ _____ $\mu\text{Ci/ml}$ = _____
5) _____	_____ $\mu\text{Ci/ml}$ ÷ _____ $\mu\text{Ci/ml}$ = _____

- E. Attach copies of radioactive waste disposal procedures and all accompanying forms.

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ATTACHMENT I

Emergency Procedures

Minor Spills (<200 ml and < 100 mCi/ml)

1. NOTIFY - Notify persons in the area that a spill has occurred.
2. PREVENT THE SPREAD - Cover the spill with absorbent.
3. CLEAN UP – Wear appropriate PPE including disposable gloves. Carefully fold the absorbent paper and pad. Insert into a plastic bag or other suitable container and dispose in the radioactive waste container. Also insert into the plastic bag/container all other contaminated materials such as disposable gloves.
4. SURVEY - with an appropriate contamination survey instrument for the nuclide(s) involved in the spill, checking the area around the spill area, hands, and clothing for contamination.
5. REPORT - Report incident to the Radiation Safety Officer.

Major Spills (>= 200 ml or >100 mCi/ml)

1. CLEAR THE AREA - Notify all persons not involved in the spill to vacate the area.
2. PREVENT THE SPREAD - Dam the spill with absorbent, but do not attempt to clean it up. Confine the movement of all potentially contaminated personnel to prevent any spreading.
3. SHIELD THE SOURCE - If possible, the spill should be shielded, but only if it can be done without further contamination or without significantly increasing your radiation exposure.
4. SECURE THE AREA - Leave the area and lock the door(s) to prevent entry.
5. CALL FOR HELP - Notify the Radiation Safety Officer immediately.
6. PERSONNEL DECONTAMINATION - Contaminated clothing should be removed and stored for further evaluation by the Radiation Safety Officer. If the spill is on the skin, flush thoroughly with lukewarm water and then wash with mild soap and lukewarm water.

Radiation Safety Officer _____

Office Phone _____

Home Phone _____

Attachment I – continued

Loss, Theft, Fire, Explosion, or Vehicle Accident

Follow the procedures outlined in the Washington State Department of Health - Radiation Emergency Handbook. Principally this shall include:

1. Secure the area around the accident. Keep unauthorized persons away. Alert people in the vicinity as to the presence of radioactivity and a possible hazard.

2. DO NOT leave the site. Send a helper or onlooker to notify the following:
 - a. Radiation Safety Officer _____
Work Phone _____ Home Phone _____
 - b. Local Police _____
 - c. Local Fire Department, where applicable _____

3. The Radiation Safety Officer, in turn, must immediately notify the State of Washington Radiation Emergency Response at (206) 682 - 5327, which is

206 N-U-C-L-E-A-R

and other local authorities, as indicated.

4. The radiation worker should inform emergency workers of the radiation hazard possibly existing, should help them keep the area secure, and should explain to the emergency personnel the location of the radioactive device or chemical and the extent of the possible hazard. In no case should the radiation worker leave the site until qualified experts arrive, unless, of course, said worker is seriously injured or incapacitated, and must be removed from the site by emergency personnel.

Alternate Names and Telephone Numbers Designated by Radiation Safety Officer

_____	_____
_____	_____
_____	_____
_____	_____

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ATTACHMENT J

Procedures for Ordering and Accepting Delivery of Radioactive Material

1. The Radiation Safety Officer, or his/her designee, will approve all orders for radioactive materials and will ensure that the requested materials and quantities are authorized by the license and that possession limits are not exceeded by addition of the incoming material.
2. A system for ordering and receiving radioactive materials will be established and maintained. The system will consist minimally of the following:
 - A. Ordering of routinely used materials –Standing Orders.
 - (1.) Written records that identify the nuclide, compound, activity levels, and supplier, etc., will be used.
 - (2.) The written records will be referenced when opening and/or storing radioactive shipments.
 - B. Ordering of other, special use, or one time use materials -
 - (1.) A written request will be obtained from the authorized user who will perform the procedure.
 - (2.) Persons ordering the materials will reference the authorized user's written request when placing the order. The authorized user's request will indicate isotope, compound, activity level, etc.
 - (3.) The authorized user's written request will be referenced when receiving, opening, and/or storing the radioactive material.
 - C. Maintain written records for all ordering and receipt procedures.
3. During normal working hours, carriers will be instructed to deliver all radioactive package(s) directly to the nuclear laboratory or to some other official receiving area for radioactive materials. The radioactive packages must be secured at all times. Packages shall never be left unattended in an unsecured location.
4. During off-duty hours, security personnel or other designated individuals will accept delivery of radioactive package(s) in accordance with the procedures as stated in your facility memorandum, see attached example.

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Attachment J - continued
EXAMPLE OF AFTER HOURS NOTIFICATION

Each facility shall complete their own version and distribute it to affected personnel and provide them with instruction pertaining to the receipt of radioactive materials after working hours

To: Security Personnel _____

From: Administrator _____

Subject: Receipt of Package(s) Containing Radioactive Material

Any package(s) containing radioactive material that arrive between 4:30 p.m. and 7:00 a.m., or on Sundays shall be signed for by the security guard on duty, and be taken immediately to the nuclear laboratory. Unlock the door, place the package on top of the counter immediately to the right of the door, and re-lock the door before exiting.

If the package is wet or appears to be damaged, IMMEDIATELY contact the company Radiation Safety Officer. Ask the carrier to remain until it can be determined that neither the driver nor the delivery vehicle is contaminated.

Radiation Safety Officer _____

Office Phone _____

Home Phone _____

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Submit a copy of your own company's memorandum

ATTACHMENT K

Procedures for Safely Opening Packages Containing Radioactive Material

1. All packages containing shipments of liquids greater than exempt quantities will be wipe tested for removable contamination. The Department will be notified in accordance with the regulations if removable contamination exceeds 2200 dpm/100 cm² or if external radiation levels exceed 50 mR/hr at the package surface or 10 mR/hr at three (3) feet (or 1m.) In addition, special procedures will be followed for packages containing quantities of radioactive material in excess of the Type A₁ or A₂ quantity limits found in WAC 246-231-200. These packages are required to be monitored for surface contamination and external radiation levels within three (3) hours after receipt if received during working hours or within eighteen (18) hours if received after working hours, in accordance with the requirements of WAC 246-221-160.

2. For all shipments containing radioactive material the following procedures for opening packages will be carried out:
 - A. Put on gloves to prevent hand contamination.
 - B. Visually inspect package for any sign of damage (e.g., wetness, crushed, etc.) If damage is
 - C. Measure surface count or rate and record. If any unexpected radiation or contamination levels are detected, immediately stop procedure and notify the Radiation Safety Officer.
 - D. Check for contamination on the external surfaces of any packages labeled with a radioactive white I, yellow II, or yellow III label, unless material is in gas form, or a special form as delineated on the packaging slip. If contamination on outer packaging is found, notify the Radiation Safety Officer, who will notify the department.
 - E. Open the package with the following precautionary steps:
 - (1.) Open the outer package (following manufacturer's directions, if supplied,) and remove packing slip.
 - (2.) Open the package and verify that contents listed on the outer source container (pig) agree with those on packing slip. Compare the requisition, packing slip, and label on outer container.
 - (3.) Take a wipe of the outer source container (pig), check the wipe for contamination with an appropriate survey instrument or scintillation counter.
 - (4.) If the outer source container is not contaminated, open the outer container and check integrity of the final source container (i.e., inspect for breakage of seals or vials, loss of liquid, and discoloration of packaging material.)
 - (5.) Check also that receipt of this shipment does not exceed possession limits.
 - F. Monitor the packing material and package(s) with an appropriate survey instrument or scintillation counter for contamination before discarding.
 - (1.) If contaminated, treat as radioactive waste.
 - (2.) If not contaminated, obliterate radiation labels before discarding in regular trash.

3. Maintain records of the results of checking each package, using "Radioactive Shipment Receipt Record" (see next page), or a form containing the same information.

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Attachment K - continued
EXAMPLE
Radioactive Shipment Receipt Report

1. P.O. No. /Vial ID No. _____ Receipt Date _____

Survey Date/Time _____ Surveyor _____

2. Condition of Package: OK Punctured Wet Crushed
 Other _____

3. Radiation measurement units on label (mR, CPM, ect) _____

4. Measured Radiation Levels (include measurement units mR, CPM, ect.)

Instrument Used _____

Background _____

Response Check _____

Package Surface _____

5. Do Packing Slip and Vial Contents Agree?

A. Radionuclide Yes No, difference _____

B. Amount Yes No, difference _____

C. Chemical Form Yes No, difference _____

6. Wipe Results From:

Outer Container (pig): _____ CPM = _____ DPM
efficiency = ()

7. Survey Results of Packing Material and Cartons/Boxes _____ CPM
If H-3 or C-14, a wipe of inner packaging will suffice.

8. Disposition of Package After Inspection _____

9. If Department and/or Carrier Notification Required, Give Time, Date, and Persons notified.

10. If Radiation Safety Officer notification is required; he/she must sign below.

RSO Signature: _____

ATTACHMENT L

Air Emissions Questionnaire to Determine Exempt Status

(Complete table below for Items 1, 2, 3 and 4.)

1. List all radionuclides to be authorized on your license. Use additional sheets as necessary.
2. Estimate the Annual Possession Quantity, the sum of the quantity of a radionuclide possessed at the beginning of the calendar year plus the quantity of radionuclide received or produced during the calendar year. Perform this calculation for each radionuclide listed in Item 1. This number must be greater or equal to the one time possession limit in item 8 of your license application.
3. For each radionuclide list all physical forms that may be exhibited during possession. If a radionuclide will exist in more than one form, give separate listings for each. List the most restrictive physical form (gas, liquid/ particulate solid, then solid, capsules are considered solid) that any quantity of radionuclide will exhibit during your process. For instance, if you will use 2 curies of tritiated water to produced H-3 gas and 1 curie of tritiated water that will remain in the aqueous phase your response should be:

H-3	1	Ci per year	liquid
H-3	2	Ci per year	gas

4. Note if radionuclide will be heated, heated under pressure, or boiled.

1. Radionuclide	2. Annual Possession Quantity (curies/year)	3. Physical Form (gas, liquid/particulate solid, or solid)	4. Heating, Heating Under Pressure, Boiling (if yes, specify temp and pressure)
A.	A.	A.	A.
B.	B.	B.	B.
C.	C.	C.	C.
D.	D.	D.	D.
E.	E.	E.	E.

5. **Release Height:** (the distance from ground level to the top of the release stack or release point). Indicate unit of measurement. _____
6. **Building Height:** Indicate unit of measurement. _____
7. **Building Width:** (the dimension perpendicular to the line from the release point to the nearest business/ residence) Indicate unit of measurement. _____
8. **Is the building shared with other businesses?** Yes No
9. **Distance to Nearest Residence/Business:** Measure the distance from use area stack release point to the nearest air intake for other residence/ business. Indicate unit of measurement. _____
10. **Stack Diameter:** Indicate unit of measurement. _____
11. **Stack Volumetric Flow Rate:** indicate unit of measurement. _____
12. **Distance from the release point to:** indicate unit of measurement for each.
 - A. **Nearest personal/commercial garden/farm producing vegetables** _____
 - B. **Nearest personal/commercial farm producing milk** _____
 - C. **Nearest personal/commercial farm producing meat** _____

Facility Name: _____ **Facility Address:** _____

Signature/ Title: _____ **Date:** _____

TO: New and Renewal License Applicants

SUBJECT: CITY/COUNTY OFFICIAL NOTIFICATIONS

The Department of Health has adopted a local Government Notification Policy as required by law. The Division of Radiation Protection notifies the appropriate local government officials whenever a Radioactive Materials License application is received. In order to allow local officials time to comment if they wish, the Division of Radiation Protection is required to delay the issuance of licenses for at least 20 days from the date of such notification. In order to expedite this notification process, please supply the information requested below.

NOTE: If you have more than one facility, your answers must pertain to the facility/facilities where radioactive materials are to be used and/or stored. Please fill out one form per facility where radioactive materials will be used and/or stored.

RETURN THIS DOCUMENT WITH YOUR RADIOACTIVE MATERIALS LICENSE APPLICATION.

Name of License Applicant: _____

***IF YOUR FACILITY IS LOCATED INSIDE THE CITY LIMITS, PLEASE INDICATE:**

Name of City: _____

Name of Mayor: _____

Complete Mailing Address of Mayor (*Street, P.O. Box, City, State, Zip Code*):

***IF YOUR FACILITY IS LOCATED OUTSIDE THE CITY LIMITS, PLEASE INDICATE:**

Name of County: _____

Name of County Commissioner: _____

Complete Mailing Address of Commissioner (*Street, P.O. Box, City, State, Zip Code*):

****IS YOUR FACILITY LOCATED ON FEDERAL OR INDIAN LAND? YES _____ NO _____**