

Appendix A: IDPH Posting for Employees

INTRODUCTION

During the course of routine operations, radioactive material may be spilled resulting in contamination of personnel or lab equipment and areas. Corrective action taken during such an incident can prevent unnecessary doses to personnel and further spread of contamination.

The IDPH has promulgated the radiation producing machines and radioactive materials rules to set standards for your protection against radiation hazards and has established procedures for you, the employee, to report any suspected items of noncompliance in an Iowa licensed or registered facility.

WHAT RESPONSIBILITY DOES MY EMPLOYER HAVE?

Any company that conducts activities licensed or registered by the IDPH must comply with the IDPH requirements. If a company violates the IDPH requirements, it can be fined or have its license modified, suspended, or revoked.

Your employer must tell you which IDPH radiation requirement apply to your work and must post IDPH Notices of Violation involving radiological work conditions.

WHAT IS MY RESPONSIBILITY?

For your own protection and the protection of your co-workers, you should know how the IDPH requirements relate to your work and should obey them. If you observe violations of the requirements or have a safety concern, you should report them.

WHAT IF I CAUSE A VIOLATION?

If you are engaged in deliberate misconduct that may cause a violation of the IDPH requirements, or would have caused a violation if it had not been detected, or deliberately provided inaccurate or incomplete information to either the IDPH or to your employer, you may be subject to an enforcement action. If you report such a violation, the IDPH will consider the circumstances surrounding your reporting in determining the appropriate enforcement action, if any.

HOW DO I REPORT VIOLATIONS AND SAFETY CONCERNS?

If you believe that violations of IDPH rules or the terms of the license have occurred, or if you have a safety concern, you should report them immediately to your supervisor. You may report violations or safety concerns directly to the IDPH. However, the IDPH encourages you to raise your concerns with the licensee or registrant because they have primary responsibility and are most able to ensure safe operation of regulated facilities. If you choose to report your concern directly to the IDPH, you may report concerns to an IDPH inspector, call or write the IDPH at the address indicated below. If you send your concern in writing, it will assist the IDPH in protecting your identify if you clearly state that you have a safety concern or that you are submitting an allegation.

WHAT IF I WORK WITH RADIOACTIVE MATERIAL OR IN THE VICINITY OF A RADIOACTIVE SOURCE?

If you work with radioactive materials or near a radiation source, the amount of radiation exposure that you are permitted to receive is limited by the IDPH regulations. The limits on your exposure are contained in Iowa Department of Public Health Radiation Machine and Radioactive Materials Rules 641 Chapter 40. While these are the maximum allowable limits, your employers should also keep your radiation exposure “as low as reasonably achievable” (ALARA).

MAY I GET A RECORD OF MY RADIATION EXPOSURE?

Yes. Your employer is required to advise you of your dose annually if you are exposed to radiation for which monitoring was required by the IDPH. In addition, you may request a written report of your exposure when you leave your job.

HOW ARE VIOLATIONS OF IDPH REQUIREMENTS IDENTIFIED?

The IDPH conducts regular inspections at licensed and registered facilities to assure compliance with IDPH requirements. In addition, your employer and site contractors conduct their own inspections to assure compliance.

MAY I TALK WITH AN IDPH INSPECTOR?

Yes. The IDPH inspectors want to talk to you if you are worried about radiation safety or have other safety concerns about regulated activities, such as the quality of construction or operations at your facility. Your employer may not prevent you from talking with an inspector. The IDPH will make all reasonable efforts to protect your identity where appropriate and possible.

MAY I REQUEST AN INSPECTION?

Yes. If you believe that your employer has not corrected violations involving radiological working conditions, you may request an inspection. Your request should be addressed to the IDPH and must describe the alleged violation in detail. You or your representative must sign it.

CAN I BE FIRED FOR RAISING A SAFETY CONCERN?

Federal law prohibits an employer from firing or otherwise discriminating against you for bringing safety concerns to the attention of your employer or the IDPH. You may not be fired or discriminated against because you:

- Ask the IDPH to enforce its rules against your employer.
- Refuse to engage in activities which violate IDPH requirements.
- Provide information or are about to provide information to the IDPH or your employer about violations of requirements of safety concerns.
- Are about to ask for, testify at, help, or take part in an IDPH, state or federal proceeding.

WHAT FORMS OF DISCRIMINATION ARE PROHIBITED?

If it unlawful for an employer to fire you or discriminate against you with respect to pay, benefits, or working conditions because you help the IDPH or raise a safety issue or otherwise engage in protected activities. Violations of Section 211 of the Energy Reorganization Act (ERA) of 1974 include actions such as harassment, blacklisting, and intimidation by employers of; (i) employees who bring safety concerns directly to their employers or to the IDPH (ii) employees who have refused to engage in an unlawful practice, provided that the employee has identified the illegality to the employers; (iii) employees who have testified or are about to testify in any federal or state proceeding regarding any provision (or proposed provision) of the ERA or the Atomic Energy Act (AEA) of 1954; (iv) employees who have commenced or caused to be commenced a proceeding for the administration or enforcement of any requirement imposed under the ERA or AEA or who have, or are about to testify, assist, or participate in such a proceeding.

HOW DO I FILE A DISCRIMINATION COMPLAINT?

If you believe that you have been discriminated against for bringing violations or safety concerns to the IDPH or your employers, you may file a complaint with the IDPH or U.S. Department of Labor (DOL). If you desire a personal remedy, you must file a complaint with the DOL pursuant to Section 211 of the ERA. Your complaint to the DOL must describe in detail the basis for your belief that the employer discriminated against you on the basis for your belief that the employer discriminated against you on the basis of your protected

activity, and it must be filed in writing either in person or by mail within 180 days of the discriminatory occurrence. Additional information is available at the DOL web site at www.osha.gov. Filing an allegation, complaint, or request for action with the IDPH does not extend the requirements to file a complaint with the DOL within 180 days. You must file the complaint with the DOL. To do so, you may contact the

Department of Labor
City Center Square
1100 Main Street, Suite 800
Kansas City, MO 64105
(816) 426-5866

WHAT CAN THE DEPARTMENT OF LABOR DO?

If your complaint involves a violation of Section 211 of the ERA by your employers, it is the DOL, NOT THE IDPH, that provides the process for obtaining a personal remedy. The DOL will notify your employer that a complaint has been filed and will investigate your complaint.

If the DOL finds that your employer has unlawfully discriminated against you, it may order that you be reinstated, receive back pay, or be compensated for any injury suffered as a result of the discrimination and be paid attorney's fees and costs.

Relief will not be awarded to employees who engage in deliberate violations of the Energy Reorganization Act or the Atomic Energy Act.

WHAT WILL THE IDPH DO?

The IDPH will evaluate each allegation of harassment, intimidation, or discrimination. Based on the evaluation, the IDPH will decide whether to pursue the matter further through an investigation. The IDPH may not pursue an investigation to the point that a conclusion can be made as to whether the harassment, intimidation, or discrimination actually occurred. However, if you have filed a complaint with the DOL, the IDPH will monitor the results of the DOL investigation.

If the IDPH or the DOL finds that unlawful discrimination has occurred, the IDPH may issue a Notice of Violation to your employers, impose a fine, or suspend, modify, or revoke your employer's IDPH license

APPENDIX B: RADIATION SAFETY LABORATORY RULES AND EMERGENCY PROCEDURES

1. Smoking, eating or drinking shall not be permitted in radionuclide laboratories.
2. Food or food containers shall not be permitted in the laboratory and refrigerators shall not be used for common storage of food and radioactive materials.
3. Radionuclide work areas shall be clearly designated and should, to the extent possible, be isolated from the rest of the laboratory. The work area shall be within a hood if the radioactive material to be used is in a highly volatile form.
4. All work surfaces shall be covered with absorbent paper which should be changed regularly to prevent the buildup of contamination.
5. Work involving relatively large volumes or activities of liquid radioactive materials should be performed in a spill tray lined with absorbent paper.
6. Protective clothing shall be worn when working with radioactive materials. This includes laboratory coat, gloves and safety glasses (when working with liquids which could be hazardous to the eyes).
7. Dosimeters shall be worn when working with relatively large quantities of radionuclides which emit penetrating radiations.
8. Mouth pipetting shall not be permitted in radionuclide laboratories.
9. All containers of radioactive materials and items suspected or known to be contaminated shall be properly labeled (i.e., with tape or tag bearing the radiation logo and the word "radioactive").
10. All contaminated waste items shall be placed in a container specifically designated for radioactive waste. Sharp items such as needles or razor blades shall be placed in a cardboard box, glass bottle, or "sharps" container.
11. A radiation survey shall be performed by the radionuclide user at the end of each procedure involving radioactive materials. All items found to be contaminated shall be placed either in the radioactive waste container or an appropriately designated area. Any surfaces found to be contaminated shall be labeled and decontaminated as soon as possible. EH&S shall be notified immediately if extensive contamination is found within the laboratory.
12. A record of the types and quantities of radionuclides possessed by each principal investigator at a given time shall be maintained.

EMERGENCY PROCEDURES

Spills

Proper preparation and training before working with radioactive materials should minimize both the risks and impacts of spills. Laboratories should be equipped with radioactive spill kits. These kits should include paper towels, cleaning agents, extra radioactive waste bags and gloves. The laboratory's initial response should follow guidance for the acronym SPILL:

- **Stop** working and get your thoughts together and don't panic.
- **Presume** everything is contaminated until proven otherwise.
- **Inform** others about the spill.
- **Localize** the spilled material to contain the spill.
- **Label** or cordon off the area to limit access.

Cleanup of a radioactive materials spill shall commence immediately after the initial response. Cleanup of spilled material shall be accomplished by following the procedures listed below.

Minor Spills

Incidents involving the release or spillage of less than 100 microcuries of a radionuclide in a nonvolatile form can generally be regarded as minor. In such cases:

1. Notify all other persons in the room at once.
2. Clear the room of all persons except those needed to deal with the spill.
3. Confine the spill immediately.
 - Liquids: Drop absorbent paper or chemical (e.g., calcium bentonite) on the spill.
 - Solids: Dampen thoroughly, taking care not to spread contamination. Use water, unless a chemical reaction would release air contaminants; otherwise use oil.
4. Notify the laboratory supervisor.
5. Notify UNI Public Safety, 273-2712.

Major Spills

Incidents which occur outside of the hood and involve the release of more than 100 microcuries of a radionuclide in a nonvolatile form, or the release of any amount of a radionuclide in a volatile form, should be considered "major." In such cases:

1. Evacuate the room immediately shutting doors and windows on the way out.
2. Notify the laboratory supervisor.
3. Notify the Radiation Safety Officer. Phone: 273-3445/ cell phone 319-230-6315.
4. Post the laboratory door with a "Keep Out" sign.
5. Assemble those persons who were present in the laboratory near the laboratory entrance.
6. Wait for assistance.

APPENDIX C: Wipe test procedures

1. Make a list of all sources to be tested. This should include at least the isotope, the activity on a specified date, and the physical form.
2. If you will be testing sources stronger than a few millicuries, set out a survey meter, preferably with a speaker, so you can monitor your exposure rate.
3. Prepare a separate wipe sample for each source. A cotton swab, injection prep pad, filter paper, or tissue paper is suitable. Number each wipe so you will know for which source it is to be used. Samples should be taken as follows:
 - a. For small sealed sources, it may be easier to wipe the entire accessible surface area. Pay particular attention to seams and joints. However, do not wipe the port of beta applicators.
 - b. For larger sealed sources and devices (survey meter calibrator), take the wipe near the radiation port and on the activating mechanism.
 - c. If you are testing radium sources, they should also be checked for radon leakage. Submerging the source in a vial of fine-grained charcoal or cotton for a day can do this. Then remove the source and analyze the absorbent sample as described below. A survey should be done to be sure that sources are adequately shielded during the leak-test period.

Analysis

Analysis of the samples is as follows:

1. Select a properly calibrated instrument that is sufficiently sensitive to detect the levels appropriate for the isotope being tested. For beta sources, a proportional flow counter, liquid scintillation counter, or thin-end window GM survey meter may be appropriate. For gamma sources, a GM instrument or a scintillation detector with a rate meter or scaler may be appropriate. Dose calibrators used in nuclear medicine are not sufficiently sensitive.
2. To estimate the detection efficiency of the analyzer used to assay the wipe samples, assay a certified check source that has the same isotope as the sealed source. If one is not available, it will be necessary to use a certified check source with a different isotope that has a similar spectrum. If calculations demonstrate that the instrument is not sufficiently sensitive to detect 0.005 microcurie for beta or gamma emitters or 0.001 microcurie for alpha emitters, a different instrument must be used.
3. Assay the wipe sample. It must be in the same geometry relative to the detector as was the certified check source.
4. Record the wipe sample in counts per minute. Then calculate and record the estimated activity in microcuries on the wipe sample.
5. Continue the same analysis procedure for all wipe samples.
6. If the wipe sample activity is 0.005 microcurie or greater, notify the RSO. The source must be withdrawn from use to be repaired or disposed of in accordance with IDPH rules.
7. Record model number and serial number (if assigned) of each source tested, radionuclide and estimated activity, measured activity or each test sample in microcuries, description of method used to test each sample, date of test, and signature of RSO. Maintain records for a period of three to five years..

APPENDIX D: Safely Opening Packages Containing Radioactive Materials

1. All shipping packages received and known to contain radioactive material must be monitored for radiation levels and radioactive surface contamination according to 40.65.
2. The following procedure for opening each package will be followed:
 - a. Put on gloves to prevent hand contamination
 - b. Visually inspect the package for any sign of damage (e.g., wet or crushed). If damage is noted, stop the procedure and notify the RSO.
 - c. Measure the exposure rate from the package at one meter. If it is in excess of 10 millirems per hour at 3 feet, stop and notify the RSO. (The “transport index” noted on packages with “yellow II” or a “yellow III” label is the approximate dose rate, in millirem per hour, at one meter from the package surface.)
 - d. Measure the dose rate on the surface of the package. The surface dose rate for such packages should not exceed 200 millirem per hour at any point on the package. The dose rate from packages with “white I” labels should be less than 0.5 millirem per hour on the external surface of the package.
 - e. Wipe the external surface of the package, approximately 300 square centimeters in the most appropriate location to detect contamination. The amount of radioactivity measured on any single wiping material when averaged over the surface wiped, must not exceed the following limits:
 - Beta-gamma-emitting radio nuclides;
all radio nuclides with half-lives less than ten days.....22 dpm/cm².
 - All other alpha-emitting radio nuclides.....2.2 dpm/cm²
 - f. Open the package with the following precautionary steps:
 - 1) Remove the packing slip
 - 2) Open outer package following the supplier’s instructions, if provided.
 - 3) Verify that the contents agree with the packing slip.
 - 4) Check the integrity of the final source container. Look for broken seals or vials, loss of liquid, condensation, or discoloration of the packing material.
 - 5) If anything is other than expected, stop and notify the RSO.
 - g. If there is any reason to suspect contamination, wipe the external surface of the final source container and remove the wipe sample to a low-background area. Assay the wipe sample to determine if there is any removable radioactivity.
 - h. Check the user’s request to ensure that the material received is the material that was ordered.
 - i. Before discarding the packing material and the empty packages, monitor for contamination with a radiation survey meter.
 - 1) If contaminated, treat this material as radioactive waste.
 - 2) If not contaminated, remove or obliterate the radiation labels before discarding it.
 - j. Make a record of the receipt.

Appendix E: Forms

University of Northern Iowa
Application for Possession and Use of Radioactive Material

Authorized User: _____

Department: _____

Radionuclide to be used in experiment: _____

Form of Radionuclide: _____

Maximum Daily Activity of Radionuclide in possession: _____

Estimated amount used per experiment: _____

Location where experiments will be conducted: Bldg: _____ Room: _____

Documentation to be attached to the Application:

1. Drawing of facility which includes locations where radioactive experiments are to take place, possible sink disposals, storage locations of radioactive material and mixed waste.
2. Experimental Procedures
3. Disposal Procedures
4. Personal Protective Equipment required
5. Additional precautions and equipment that are necessary
6. Authorized User vitae which includes training and experience with handling radioactive material.

Authorization Signatures:

Authorized User: _____

Department Head: _____

Radiation Safety Committee Representative: _____

Radiation Safety Officer: _____

Sponsored Programs Representative: _____

UNI – Radiation Safety Assessment Checklist

Assessment Performed By: _____ Date of Assessment: _____
 Building /Room: _____ Authorized User: _____
 Other individuals contacted: _____

YES	NO	NOT APPL	NOT OBS	COMMENT #	ASSESSMENT AREA
					Security: Lab locked/secured upon arrival or was someone physically present to prevent unauthorized removal?
					Lab entered during regular business hours 8am – 5 pm?
					Lab entered during off hours?
					Can described documents be located? IDPH notification
					Emergency procedures
					Restricted Access
					Drain log
					After use survey
					All entrances or designated work area taped off?
					All signs posted in prominent and appropriate locations?
					Labeling: All radioisotope work areas, including disposal sinks, properly identified and labeled?
					All containers properly labeled with “Caution Radioactive Material” and other pertinent information (i.e. isotope, activity, initials, date, etc.)?
					All radioactive waste containers properly labeled?
					All glassware and equipment utilized for radioactive materials properly labeled and distinguished from non-rad equipment?
					Radioactive Materials: All radioactive materials used in the lab listed on 6 month inventory or current order information?
					Do records indicated all radioactive materials purchased are forwarded to EH&S?
					Are records maintained for wipe test protocol and being conducted on every delivery?
					Are there any sealed sources being used? (check sources, LSC standards, survey meter or other instrument standards)?
					Are radioactive materials transferred to other researchers? Is EH&S notified prior to transfer?
					Waste: All radioactive waste containers located away from high traffic areas?
					Is liquid radioactive waste kept in secondary containment?
					Are radioactive wastes properly segregated according to physical characteristics and half-life?
					Are radioactive waste containers transferred to the Radioactive Waste Storage when full before overflowing?
					Are the sanitary sewer discharges calculated to assure compliance and records maintained?
					Facilities & Equipment: All radioactive material storage and use areas properly labeled/identified, shielded and maintained?
					Appropriate PPE (gloves, lab coats, glasses, etc.) available and used when radioisotope work is conducted?
					Are protocols tested prior to using radioactive materials?
					Survey instrument operable and calibrated within previous year and are efficiencies appropriate and used properly?

					Are appropriate laboratory apparatus available, properly labeled and used for radioisotope work?
					Absorbent paper and trays used for radioisotope work?
					Work surfaces made of impervious materials?
					Are hoods used for RAM procedures?
					If yes, has the hood been checked for flow within the past year?
					Any LSC's or other device containing RAM used in the lab?
					If yes, have tests for leakage and other required tests been done?
					Proper shielding available and used properly?
					Records & Surveys: Are radioactive materials accountability records maintained and readily available?
					After use and contamination surveys conducted by Authorized User after each use and at a minimum weekly interval for active labs,(monthly for inactive labs) with records available for review?
					Survey form used keyed to diagram? (showing locations, surveyor, instrument, serial number, readings, calibration date, etc.)?
					Shipping container disposal records adequate? (labels removed, defaced or obliterated?)
					All Lab personnel acting as Authorized User using radioactive materials listed on license?
					All other personnel attended Radiation Awareness Training?
					Evidence of food consumption in lab areas?
					Do personnel routinely monitor/Frisk themselves?
					Incidents: Any incidents/spills since last assessment?
					If yes, were actions taken appropriate and documentation of follow-up acceptable?
					Previous Deficiencies: Have previous deficiencies been corrected? Refer to previous assessment checklist..

Comments: Key to Comment # Column – attach pages if necessary

1. _____
2. _____

3. _____

4. _____

5. _____

RAD Safety Program (1/5/22)

Routine After-Use Survey Form

User: _____ **Building:** _____ **Room#** _____

Survey Instrument Type: _____

Model Number: _____ **Serial Number:** _____

Directions:

- 1. Hands and working area are required to be surveyed after each use with radioactive materials. Wipe tests are required for work with 3H.
- 2. Forms should be kept on record, either in laboratory, laboratory notebook or office file.
- 3. Copy of form will be requested with 6-month inventory.

Date	Name	Isotope	Survey Meter Reading Bck= $<.004$ mR/hr		Results
			Hands and Clothing	Work areas	

Any concerns or questions contact the Radiation Safety Officer, Gordon Krueger: 273-3445

(10/21/21)

Radioactive Material Inventory Form

Due date:

Return to Gordon Krueger - mail code 0197

DATES OF SUMMARY PERIOD : _____ to _____

Radioactive Material	Location, room number	Quantity at Beginning of Period (uCi)	Form	Date	Supplier	Surveyed on Receipt YES / NO	Total Quantity on Hand at End of Period (uCi)	Quantity Disposed (uCi)	Method of Disposal

(9/19/18)

NAME OF AUTHORIZED USER _____

SIGNATURE _____ DATE _____

Nuclide Pre-Approval Form

- ✦ Company who ordering from:
 - ✦ Authorized user:
 - ✦ Location for delivery:
 - ✦ Nuclide:
 - ✦ Activity:
 - ✦ Form:
 - ✦ Date: 7/13/21
-

Office Use only

Authorized amount of above nuclide for authorized user: _____

Current amount on hand: _____

RSO approval signature: _____ : Date _____

Comment:

Certificate of Transfer and Destruction of Radioactive Material

Authorized User: _____ Current Material Location: _____

Material Transferred From: _____

Form of Radioactive Material: _____ Radionuclide: _____

Date Material Received: _____ Method of Disposal: Landfill/Licensed contractor
(circle one)

Date Material Disposed: _____

Circle method used to determine residual activity:
Survey meter/Scintillation Counter

Survey Instrument Info:

Manufacturer Name: _____ Model Number: _____

Serial Number: _____

Activity of Source Material: _____

Activity of Waste Material (Measure Inside of Waste Bag): _____

Voluntary Declaration of Pregnancy

Name _____ Date of Birth _____

University ID _____ Date of Conception (Mo/Yr) _____

Address _____

I am submitting this *Voluntary Declaration of Pregnancy* to inform my principal investigator and Environmental Health and Safety (EH&S) that I am pregnant as of the date shown above. Under the provisions of 10 CFR Part 20.1208 or State of Iowa Standards for Protection Against Radiation (641-40.22(136C)) as applicable, I understand

- my exposure will not be allowed to exceed 5 mSv (500 mrem) during my entire pregnancy from occupational exposure to radiation;
- this limit includes exposure I have already received;
- if my estimated exposure has already exceeded 5mSv (500 mrem), I will be limited to no more than 0.5 mSv (50 mrem) for the remainder of my pregnancy; and
- I may revoke this declaration at any time with out explanation by submitting a signed and dated statement requesting the revocation.

Signature _____ Date _____

Acknowledgement of Declaration of Pregnancy

Name of Supervisor (Print): _____

I acknowledge that the above individual has submitted to me a Declaration of Pregnancy statement. I understand it is my responsibility to forward this form to the Radiation Safety Officer (RSO) at Environmental Health and Safety (EH&S) to ensure that this individual is properly trained about potential exposure risks to their unborn child.

Signature _____ Date _____

Contact EH&S to schedule a consultation: Radiation Safety Officer, (319) 273-3445 or email Gordon.Krueger@uni.edu.

The information furnished on this form will be used and maintained pursuant to 5 U.S.C. 552a(e)(3), enacted into law by Section 3 of the Privacy Act of 1974 (Public Law 93-579).