

**University of Alaska Fairbanks
Safety System Procedure**

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Subject: **Non-Radioactive Hazardous Materials Management Procedure**

Introduction to Hazardous Waste Management

Background: In Alaska, hazardous wastes are regulated by the Environmental Protection Agency under the authority of the Resource Conservation and Recovery Act (RCRA). Hazardous waste regulations are found in the Code of Federal Regulations (CFR) at 40 CFR Parts 260-282. These regulations identify:

- "Cradle to grave" responsibilities for generators of hazardous waste.
- Criteria for the identification and listing of hazardous wastes.
- Enforceable standards applicable to hazardous waste generators, transporters, and treatment, storage and disposal facilities.

Based upon the volume and type of wastes generated, hazardous waste generators are classified into three categories:

- Very Small Quantity Generators (VSQG),
- Small Quantity Generators (SQG)
- Large Quantity Generators (LQG)

Large Quantity Generators

A generator is a LQG as defined by the following criteria:

The site generated more than 1000 kg of non-acute hazardous waste per month or more than 1 kg of acute hazardous waste per month or more than 100 kg of spill cleanup materials, contaminated with a RCRA acute hazardous waste.

VSQG's	SQG's	LQG's
<p>< 100 kg/month < 1 kg P-listed</p> <p>Never to exceed 1000 kg in storage prior to disposal</p>	<p>>100 kg < 1000 kg < 1 kg P-listed per month</p> <p>Never to exceed 6000 kg in storage</p> <p>Must ship within 180 days*</p>	<p>> 1000 kg per month or > 1 kg P-listed</p> <p>Must ship RCRA-regulated wastes every 90 days</p>

* Pending distance to EPA permitted TSDF (Treatment Storage and Disposal Facilities)

The University of Alaska Fairbanks campus is currently regulated as a large quantity generator (LQG) of hazardous waste. LQG's are allowed to accumulate hazardous waste on-site at a central accumulation for up to 90 days, providing that the generator complies with certain regulations pertaining to: container-tank requirements, labeling-dating requirements, contingency planning and personnel training requirements.

Wastes are primarily generated by laboratory operations and facility maintenance activities. Approximately two hundred sites have been identified on campus that may, on occasion, generate hazardous wastes. Wastes are removed from the point of generation by EHSRM personnel and temporarily stored (less than 90 days) at the UAF Hazardous Materials Facility (HMF).

The need for removal of surplus chemicals or chemical wastes is communicated to EHSRM electronically by use of the EH&S Assistant online waste removal request program. Information about EHS Assistant and a waste pickup request tutorial are found on the UAF EHSRM website (www.uaf.edu/safety).

RCRA-regulated wastes, that have been temporarily stored at the UAF Hazardous Materials Facilities, are shipped within 90 days to EPA permitted TSDF's located in the continental United States.

UAF Hazardous Waste Management Procedures:

To communicate the need for the removal of hazardous materials or other chemicals, utilize the EH&S Assistant program, waste pickup link.

Complete the waste pickup request detail pages. This includes:

- Waste type
- The physical state of the material, i.e., solid, liquid, gas

- Number of units and unit of measure
- Approximate quantity of the material
- Container type, i.e., glass, plastic, metal, fiber-board
- On-site temporary storage location
 - Date generated (satellite accumulation start date)
- Chemical name/description or name and percentages of chemical constituents

Submit request. Requests are automatically updated in the EH&S Assistant program.

Fill out and affix required hazardous material label (orange transfer label) on containers and promptly place in approved hazardous material collection areas.

At this time when the accumulation of a material begins, the date should be clearly marked and visible for inspection (mark “satellite accumulation start date” on transfer label.)

Upon receipt of the waste pickup request, EHSRM will arrange for pick-up and transfer of the materials listed on the waste request. Hazardous materials are removed from collection areas by EHSRM, Hazmat Section personnel and transported to UAF’s central accumulation facility (Hazardous Materials Facility).

The eight primary **RCRA concerns** involve:

- Appropriate labeling
- Appropriate accumulation start date
- Less than maximum storage time
- Less than maximum storage volumes
- Lids/caps are securely fastened
- Materials are properly segregated
- Compatible containers and closure are used for waste storage
- Spills, overfills and general mismanagement are absent

General rules for proper management of surplus hazardous materials and wastes include, but are not limited to, the following:

- A container holding hazardous waste must always be closed during storage, except when it is necessary to add or remove waste - per 40 CFR 262.17(a)(1)(iv)(A).

- A container holding hazardous waste must not be opened, handled or stored in a manner which may rupture the container or cause it to leak – per 40 CFR 262.17(a)(1)(iv)(B).
- Containers holding hazardous wastes must be made of or lined with materials that will not react with the waste, so that as the waste is stored the ability of the container to hold the waste will not be impaired – per 40 CFR 262.17(a)(1)(iii).
- If a container holding hazardous waste is not in good condition, or if it begins to leak, the contents must be transferred to a container in good condition – per 40 CFR 262.17(a)(1)(ii).
- Assure the hazardous materials located in collection areas are stored in a safe manner, i.e.; with regard to chemical compatibility. *To determine chemical compatibility, refer to the Safety Data Sheet for the product. Additional references are available at EHSRM.*
- Liquid wastes should be stored in secondary containment.
- Hazardous material collection areas, (satellite accumulation areas), should be inspected by departmental personnel at least once per week.
- Label and identify the contents of all containers. List the name and percentages of all constituents.

Marking the container includes:

the words “Hazardous Waste” when applicable

Words identifying the contents

An indication of the hazards of the contents

- Accumulation of materials in containers larger than 26 gallons must be approved by a EHSRM Safety Officer or Hazardous Material Coordinator, prior to use.
- To maintain satellite accumulation area status, no more than one quart of acutely hazardous (P-listed) waste or 55 gallons of hazardous waste may be collected in a shop or laboratory, prior to removal. *If a laboratory or shop accumulates in excess of 500 ml of acutely hazardous waste (see P-list), or 50 gallons of a regulated waste, personnel must contact EHSRM immediately to request the removal of those materials.*

If accumulating ignitable materials, care must be taken to store the material in accordance with applicable fire safety codes and procedures.

Before placing hazardous materials in a collection area, check containers thoroughly to assure that no leaks are present.

- The outside of the containers must be clean and free of chemical contamination.
- Use appropriate containers. All glass containers must be securely packaged to prevent breakage during transport.
- All containers of liquids must have screw lids and must not leak when inverted. Corks, cotton plugs, tape, or parafilm are not acceptable lids for containers of hazardous materials.
- All containers of liquids must be placed in secondary containment.
- If possible, use the same container for disposal of used material that held the new material originally.
- Loose solid materials must be placed in a sealed container or in a cardboard box lined with two polyethylene bags.

Containers storing hazardous waste must be kept closed, except when adding or removing contents.

Any leaks or spills must be promptly reported to the UAF Fire Department (phone 7721 or 911.) The Fire Department is responsible for notifying the Safety Officer/Hazardous Material Coordinator (all such instances), or Hazardous Material Response Team as deemed necessary.

Attach information to the container to identify any special known or suspect hazard information.

Hazardous materials should never be simply abandoned at hazardous material collection areas or accumulation sites.

Empty Containers

Empty containers should be clean and marked with the word "Empty" or the initials M/T.

Containers which have held P-listed (acute hazardous) listed materials are regulated for disposal.

Pesticide containers should be triple rinsed (with the rinsate added as a part of the application solution). The container should be punctured and marked accordingly.

Broken glass should be properly packaged in puncture proof containers, i.e. poly-lined fiberboard boxes, and marked to identify contents. Contact EHSRM for removal.

Bio-Hazardous Materials

Please refer to the UAF Institutional Biosafety Handbook, which is available at:
<http://www.uaf.edu/ibc/>

The UAF Bloodborne Pathogen Policy and Procedure that is available at:
<http://www.uaf.edu/safety/>

or contact EHSRM for more information.

Used Oil Management

Used oil management standards are found at 40 CFR Part 279. Used oil means any oil that has been refined from crude oil, or any synthetic oil, that has been used and as a result of such use is contaminated by physical or chemical impurities.

Used oils must be:

- Collected in clean containers in good condition (no severe rusting, apparent structural defects or deterioration) that are intact and do not leak.
- All containers of used oil, including collection and transfer containers must be marked with the words "Used Oil". Adhesive "Used Oil" labels are available from EHSRM.
- Used oil containers should remain closed at all times other than when adding or removing used oil.
- Solvents, parts washer fluids, carburetor cleaners or glycols must never be added to the used oil container.

Used Oil Spills – Releases: Notify EHSRM (40 CFR 279.22 (d) identifies the following cleanup steps in the event of a release of used oil: a) stop the release, b) contain the released used oil, c) clean up and manage properly the used oil and other materials and d) if necessary, repair or replace any leaking used oil storage containers or tanks prior to returning them to service).

To determine if used oils are on-specification, off-specification or regulated as a hazardous waste, EHSRM submits samples of used oils for energy recovery parameter analyses which includes:

- EPA 6010: arsenic, cadmium, chromium and lead content
- EPA 1010: flashpoint
- ASTM D808: total halogens
- EPA 8080: polychlorinated biphenyls

Used Oil Specifications:

- Arsenic 5 ppm maximum
- Cadmium 2 ppm maximum
- Chromium 10 ppm maximum
- Lead 100 ppm maximum
- Flash point 100 °F minimum
- Total Halogens 4,000 ppm maximum*

*Used oil containing more than 1,000 ppm total halogens is presumed to be a hazardous waste under the rebuttable presumption provided under 279.10 (b)(ii). Such used oil is subject to subpart H of part 266 of the Code of Federal Regulations rather than this part when burned for energy recovery unless the presumption of mixing can be successfully rebutted. Call EHSRM for more information.

UNIVERSAL WASTE BATTERIES INFORMATION

Background:

An alternative set of management standards, in lieu of regulation under 40 CFR parts 260-272 (hazardous waste regulations), are identified in 40 CFR part 273, Standards for Universal Waste Management. This part establishes requirements for managing batteries (as described in 273.2), pesticides (as described in 273.3), thermostats (as described in 273.4) and lamps (as described in 273.5). The universal waste regulations include seven subparts. A brief description of four of these subparts follow:

Small quantity handlers (SQHUW's); 5000 kg or less of total universal waste handled at one time. Notification to EPA is not required, shipments are not required to be manifested, no record retention requirement.

Large quantity handlers (LQHUW's); greater than 5000 kg of total universal waste at one time. Must notify EPA of universal waste activity, obtain an EPA ID number (if they don't already have one) and retain off-site shipment records for 3 years. This can be a logbook, invoice, manifest, bill of lading or other shipping document.

Transporters of universal waste batteries; must be done in accordance with Department of Transportation regulations found at 49 CFR part 171-180.

Destination Facilities; regulations found at 40 CFR 273.6.

The management requirements for SQHUW's are found at 40 CFR 273.13 and include the following:

Packaging requirements:

A small quantity handler of universal waste must contain any universal waste battery that shows evidence of leakage, spillage, or damage that could cause leakage under reasonably foreseeable conditions in a container. The container must be closed, structurally sound, compatible with the contents of the battery, and must lack evidence of leakage, spillage or damage that could cause leakage under reasonably foreseeable conditions.

Ensure that all batteries are completely discharged before segregation in the appropriate container.

Labeling requirements:

Universal waste batteries (i.e.; each battery), or a container in which batteries are contained, must be labeled or marked clearly with any on of the following phrases: "Universal Waste Battery(ies)," or "Waste Battery(ies)," or "Used Battery(ies)."

Accumulation time limitations:

A small quantity handler of universal waste may accumulate universal waste for no longer than one year from the date the universal waste is generated, or received from another handler. The handler must be able to demonstrate the length of time that the universal waste has been accumulated from the date it becomes a waste or was received.

Employee training:

A small quantity handler of universal waste must inform all employees who handle or have responsibility for managing universal waste. The information must describe proper handling and emergency procedures appropriate to the type(s) of universal waste handled at the facility.

Responses to releases:

A small quantity handler of universal wastes must immediately contain any releases of universal waste and other residues from universal wastes. Determine whether or not any of the material resulting from the release is hazardous waste, and if so, compliance with all applicable requirements of 40 CFR parts 260-272 is required.

Standard Operating Procedures:

- Call EHSRM, Hazmat Section (474-5617 or 474-5758) to obtain battery collection containers with lids. Mixing battery types is permissible under SQHUW regulations found at 40 CFR 273.13(a)(2)(ii).
- Ensure that each collection container is marked with the words, "Universal Waste Batteries," and that each collection container is marked with the date that the accumulation of batteries began. (Container labels are available from EHSRM, Hazmat Section).
- Ensure that the collection containers are closed at all times unless adding or removing.

- In writing, identify the location of the battery collection container(s) under your control to EHSRM, Hazmat Section.
- EHSRM, Hazmat Section will be responsible for the quarterly removal of batteries from these locations and will segregate universal waste batteries by battery type.
- Contact EHSRM, Hazmat Section (474-5617 or 474-5758) with any special needs, i.e.; removal of large (i.e.: automotive size) lead-acid, Ni-Cd, air-alkaline or other batteries.

USED FLUORESCENT LAMP MANAGEMENT INFORMATION

Background:

On June 28, 1999, the EPA announced that spent mercury containing fluorescent lamps were included in the “universal waste final rule.” This Final Rule, (59 FR 38288) pertains to the management of spent mercury containing lamps including fluorescent, high-pressure sodium, neon, HID (high intensity discharge), mercury vapor, and metal halide lamps. Other universal wastes include spent lead-acid batteries, mercury thermostats, and certain types of pesticides.

The final rule defines four types of universal waste handlers (generators):

Small quantity handlers (SQHUW’s); 5000 kg or less of total universal waste handled at one time. Notification to EPA is not required, shipments are not required to be manifested, no record retention requirement.

Large quantity handlers (LQHUW’s); greater than 5000 kg of total universal waste at one time. Must notify EPA of universal waste activity, obtain an EPA ID number (if they don’t already have one) and retain off-site shipment records for 3 years. This can be a logbook, invoice, manifest, bill of lading or other shipping document.

Transporters of universal waste do not need to comply with the RCRA manifest requirements. Transporters can store universal wastes for ten days or less. If shipments are made to facilities with State Authorization and where lamps are already regulated as a hazardous waste, then a uniform hazardous waste manifest is required to document the shipment.

Destination Facilities; regulations found at 40 CFR 273.6

The management requirements for SQHUW’s and LQHUW’s are found at 40 CFR 273.13 and include the following:

Packaging requirements to prevent breakage of spent lamps during accumulation, storage and transport as identified in the Final Rule, “Universal waste lamps must be stored in containers or packages that remain closed”, are structurally sound, adequate to prevent breakage, compatible with contents of the lamps, and lack evidence of leakage, spillage or damage that

could cause leakage under reasonably foreseeable conditions. Examples of acceptable packaging could include placing lamps evenly spaced in double or triple-ply cardboard containers with closed lids.

Labeling requirements indicate that each lamp or the container holding the lamps must be labeled with the words “Universal Waste Lamps”, or “Waste Lamps” or “Used Lamps.”

Accumulation limitations indicate that handlers may accumulate universal waste for one year. Mark the date on the container to identify when the first lamp has been packaged.

Regulations for release of universal waste are found at 273.17 and 273.37. For SQHUW’s immediately cleanup and containerize accidentally broken lamps; containerize in structurally sound, compatible packaging that prevents the leakage of mercury into the environment.

Employee training requirements are found at 40 CFR 273.16 and 273.36. The training requirements indicate all employees that handle or have responsibility for the management of universal waste are informed of the proper handling and emergency procedures appropriate to the type(s) of universal waste handled at the facility.

Land Disposal Restriction information is found at 40 CFR part 268.

The prohibition on treatment; includes crushing operations. *Note:* There is some discussion that may allow RCRA VSQG’s (very small quantity generators) to crush lamps at the point of generation. This would not apply to UAF.

Standard Procedures

- Segregate fluorescent tubes by length and style, i.e.; 4 ft., 8 ft., HID and U-shaped tubes.
- Package all lamps to comply with requirements. Reuse packaging provided with the new replacement lamps until further notice. (Alternative packaging may be provided at a later date).
- Document the type of lamp, the quantity and the packaging date on the labels provided.
- Tape both ends, and all openings of the packaging shut.
- Apply the label to the end of the package.
- Drop off full boxes at the Hazardous Materials Facility between 2:00 p.m. and 4:30 p.m. Wednesday only.

Broken Lamp Procedures

The Final Rule indicates that, “handlers must contain any universal waste lamps that show evidence of breakage, leakage or damage that could cause a release of mercury or other hazardous constituents to the environment.”

Utilize protective eyewear and puncture resistant gloves to pick-up and containerize all glass shards, end caps and phosphors resulting from unintentionally broken lamps.

Accidentally broken lamps must be placed in the sealable containers provided by EHSRM, Hazmat Section.

Summary

Tube crushing is prohibited under the prohibition on treatment portion of the final rule (page 24 of 50).

UAF desires to maintain a SQHUW universal waste handler status. Other universal wastes, i.e.; mercury switches/thermostats and pesticides are shipped quarterly with our hazardous waste shipments. The primary accumulation of universal waste is comprised of fluorescent tubes, which should not be allowed to exceed 5000 kg (11,000 lbs.). Shipments of packages, unbroken tubes will be scheduled to occur at least annually or so as to prevent the accumulation in excess to 5000 kg., (net weight of lamps without packaging). Used lamps are periodically shipped to a recycler.

Hazardous Waste Minimization

Waste minimization is always a priority. It can and should occur by a variety of means such as:

- Product substitution
- Surplus chemical exchange programs (Contact EHSRM for a listing of surplus chemicals which are available to approved campus laboratories).
- Distillation/recovery
- Microscale chemistry techniques.

Information regarding waste minimization is available from EHSRM Hazmat Section, the Environmental Protection Agency and the Alaska Department of Environmental Conservation.

Chemical Spills

Chemical leaks or spills must be promptly reported to the UAF Fire Department Dispatch Center (474-7721) or call 911 if there is an immediate threat of harm to life or property. The caller should try to provide a detailed description of the spill, including the name and approximate quantity of the chemical(s) involved. Do not put yourself or others at risk to obtain this information.

The Fire Department will respond to personnel injuries and incidents where life or property is threatened, but will typically not participate in chemical spill cleanup. The Fire Department is responsible for notifying UAF Environmental, Health, Safety and Risk Management and/or the Fairbanks Borough Hazardous Material Response Team as deemed necessary. **In all instances, report chemical spills to the UAF Fire Department** and depending on the nature of the spill, you may be asked to complete the **UAF Oil and Hazardous Substances Spill Reporting Form**. More instructions and reporting information is included in the reporting form.

Cleanup of small chemical spills, in which no fire or health hazards are present and no injuries have occurred, can be done by department personnel. Personnel doing the cleanup must be properly trained and have access to the appropriate personnel protective equipment, necessary to cleanup the spill.

General Rules and Precautions include:

- Call 7721 or 911 to communicate as much information about the spill as possible. If the material or hazards are unknown, do not put yourself or others at risk to gain additional information. Without putting yourself at risk, attend to anyone who may have been contaminated by the spill.
- Avoid breathing vapors of the spilled material. Ensure that the fume hood(s) is on. Open windows when appropriate to increase ventilation.
- Secure the area and notify others about the spill. Evacuate all nonessential personnel from the spill area. Notify responsible parties; e.g., instructors, department head, supervisors, etc.
- If the chemical nature of the spill is unknown, treat the spill as you would a highly toxic hazardous material; take all safety precautions and evacuate the area. If the spilled material is flammable, turn off all ignition and heat sources.
- Consult reference materials, including, but not limited to, the MSDS (material safety data sheet) for information regarding the spilled material(s). The material safety data sheet will provide information on the potential hazard involved (sections 1 through 6); spill and disposal procedures (section 7); protective equipment and measures (section 8); storage, handling data (section 9); and transportation data.

The Sigma-Aldrich [Library of Chemical Safety Data](#) contains procedures for mitigating hazardous materials spills. This information is available from UAF EHSRM.

- Secure cleanup supplies and the appropriate personnel protective equipment. Ensure protective apparel is resistant to the spill material.

- Confine or contain the spill to the smallest area as possible.
- Utilize methods and procedures as described in the reference material to cleanup the spill.
- Materials resulting from cleanup operations may be RCRA-regulated. Contact EHSRM for assistance and removal.

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