Washington State University Tri-Cities Hazardous Waste Management Plan (HWMP)

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1.0 INTRODUCTION

This document describes hazardous waste management requirements and procedures for Washington State University, Tri-Cities (WSUTC). Proper waste management provides opportunities for:

- Reduction in disposal costs
- Good stewardship of the environment and WSU facilities
- Enhanced safety of employees, students, volunteers and visitors
- Reduction of the university's exposure to liability and regulatory citations and fines.

This plan applies to all activities performed by building/grounds maintenance, academic and research laboratories, and other university offices conducting activities which are regulated by the Washington State Department of Ecology Dangerous Waste Regulations, Washington Administrative Code (WAC) 173-303.

2.0 PROGRAM BASICS

Measures to reduce and prevent creation of dangerous wastes will be outlined in this document[1].

Once dangerous wastes are generated, there are specific legal requirements for how they must be managed. State and federal regulations describe requirements for all of the following waste-related activities:

- Accumulation
- Labeling and Signage
- Recordkeeping
- Accumulation area inspections
- Treatment
- Transportation of Wastes
- Authorized Disposal Methods
- Training

All of these will be discussed in more detail in the following pages.

WSU Tri-Cities Environmental Health & Safety (EH&S) department provides staff to ensure the proper handling, accumulation, and disposal of dangerous wastes.

[1] Please note that while Washington State generally uses the term "Dangerous Waste", the term "Hazardous Waste" may be used interchangeably.

3.0 POLLUTION PREVENTION

WSUTC is committed to eliminating and reducing waste generation and associated hazards. In order to accomplish this, generators must consult with EH&S before initiating any process which will create dangerous waste. When waste generation cannot be eliminated, disposal methods and costs can be discussed.

The following are additional measures to reduce waste generation:

1. Accepting donated chemicals from outside of WSU is generally not allowed. EH&S must be consulted prior to accepting any such donations.

2. Prior to transfer of chemicals between WSUTC departments, EH&S must be notified, and both departments' chemical inventory and Safety Data Sheet (SDS) files must be updated.

3. Obtain the smallest volume of chemical required to meet the needs of your project. This will ensure that unused products do not accumulate and become large quantities of waste.

4. If you require only a small quantity of a chemical, contact EH&S to determine if it may be available from another user on campus prior to ordering new product.

5. If you are working with pesticides, contact EH&S prior to any ordering, efforts can be made to ship unused materials back to the vendors as well as ship only the amount needed for the study.

Spill prevention and minimization efforts must be implemented to reduce the potential for generation of more waste. This includes the use of secondary containment for chemical accumulation areas, transporting materials, and dispensing chemicals. Having spill supplies on hand will help minimize the spread of contamination.

Standard operating procedures (SOP's) must consider methods of waste minimization. It may be possible to reduce waste generation by substituting products and materials, using microscale procedures, re-using or recycling chemicals from other experiments. Contact EH&S to explore using another department's excess chemical stocks. New SOPs must identify waste reduction alternatives when the process is being planned.

4.0 DANGEROUS WASTE ACCUMULATION PROCEDURES

Satellite Accumulation Areas (SAAs) and larger Central Accumulation Areas (CAAs) are both used for management of dangerous wastes on campus. SAAs are located in the immediate vicinity of the location where wastes are generated (typically, in the same room), and must be secure. Once certain thresholds are met (detailed below) containers must be transferred from the SAA to the Central Accumulation Area for disposal. Both types of accumulation areas have specific requirements, which must be met.

4.1. Satellite Accumulation Areas (SAAs)

SAAs can be located anywhere on campus, and can be a room, part of a room, a cabinet, fume hood, or other location which is "at or near the point of generation." These areas must be under the control of the person generating the waste(s). SAAs must meet the following requirements:

- SAAs must be secured when the area is not occupied and should be identified with the sign: "Satellite Accumulation Area".
- Containers located in an SAA must:
    - Be compatible with the waste material, in good condition, and clean both inside and outside.
    - Have a secure lid that cannot be dislodged during accumulation and transport[2]. Ground glass, cork or rubber stoppers; Parafilm, foil; or snap cap lids cannot be used to seal waste containers.
    - Be kept closed except when adding waste. Containers receiving waste from instruments such as GCs and HPLCs must have a line running through a cap or secure stopper.
    - Be clearly labeled <u>when waste is *first* placed in them</u>. (See Section 4.0 for further details.)
- Date and report the waste to WSUTC EH&S for collection (see Section 5.0) when:
    - Containers are full (leave an air space of at least 10% of the container volume)
    - Waste accumulation ends (the end of an experiment or class)
    - A total volume of 55 gallons of waste (or 1 quart of Acutely Hazardous Waste) is accumulated
- Once reported, wastes are to be removed from the SAA within 3 working days.

4.2 Central Accumulation Areas

The Bioproducts, Sciences, and Engineering Laboratory (BSEL), Collaboration Hall (TCOL), and Wine Science Center (WSC) buildings have Central Accumulation Areas managed by EH&S (BSEL 151A, TCOL 116A, and WSC 130). Wastes from SAAs are consolidated in these areas for further management prior to disposal.

Requirements for Central Accumulation Areas include:

- The area is locked when not in use, and there is limited key access. Wastes are stored by hazard classification(s), and are properly segregated.
- The area is posted and identified as "Dangerous Waste Storage - Authorized Personnel Only." Emergency contacts and phone numbers are posted by the entry door. Only authorized and trained personnel are allowed to work in this accumulation area.
- Wastes must be properly labeled (see section 5.1) and inventoried
- When wastes are present in the CAA, weekly inspections are required to be conducted and documented.
- See Section 7.0 for more detailed Central Accumulation Area procedures.

[2] On rare occasions, it may be necessary to leave waste bottles loosely capped in order to prevent pressure from building up in the container. Such wastes must be clearly labeled and placed in a fume hood, where they cannot be disturbed, until it is safe to securely close them.

5.0. LABELING OF DANGEROUS WASTE

5.1 Dangerous Waste Labeling

Labeling is a critical part of proper waste management. All wastes must be clearly labeled to identify their contents and associated hazards. Every container will be handled by several people, inside and outside of the university, before its final disposal. In order to ensure the safety of personnel at each step in the disposal process, containers must be labeled completely and accurately.

Proper labeling of waste containers includes ALL of the following:

- The words "Hazardous Waste" or "Dangerous Waste". (These are interchangeable)
- The waste generator's name and phone number
- A unique ID number, which cannot be duplicated (this is not required during accumulation, but must be transferred from the online Chemical Collection Request once the waste is submitted for collection)
- Identification of ALL waste constituents (including water), and their approximate percentages, which total 100%[3]. Full chemical names must be used, formulas or abbreviations are not acceptable
- The hazard(s) associated with the waste (flammable, toxic, corrosive, etc.) determined by the Safety Data Sheet (SDS) or by knowledge and testing
- The date the container was filled, or the date on which it was declared waste

Additional label requirements:

- Writing must be legible. Print clearly or type labels.
- All of the information above must be clearly visible.
- Use permanent ink.
- For containers with a volume of 1 gallon or larger, the words "Hazardous Waste" or "Dangerous Waste" and the hazard(s) associated with the waste must be in letters at least ½" tall.
- If you have an unknown, and don't know what the waste consists of, write in "Unknown (solid, liquid, or gas)" and describe it as best you can such as, "brown thick liquid". Also provide information on where it was found, in order to determine what type of material it may be

In addition to the label information, each container must comply with the following:

- All information on any existing labels on the container must be completely marked out or the labels removed to prevent any confusion.
- The outside of the bottle where the label will be affixed must be cleaned to ensure the label will stay attached, and placed where it will be easily visible.
- When the container is too small to affix this label, the container is placed in a clear plastic bag, sealed, and the label is placed on the outside of the plastic bag.
- If there are several or many small vials containing the same waste material, the vials are placed in a sealed outer container such as a bag or box, and the label is affixed on the outside. Indicate on the label that there are small vials of waste inside.
- If it is expected the label may be subjected to spills from filling the container, seal over the waste label with clear packaging tape after the label has been completed to protect the label ink from running, and becoming illegible.
- **Polychlorinated Biphenyl (PCB) wastes,** such as old fluorescent light fixture ballasts, must have the date the material was taken out of service (out of service date) written on the outside of the container. (See specific procedure in Section 22.1)

[3] A range of percentage values is allowable, but must be as narrow as possible and must account for 100% of the waste.

Labels meeting the above requirements will be automatically created when generators use the online Chemical Collection Request (Section 6.1). WSUTC EH&S will provide an electronic label for printing, but will not provide physical labels.

5.2 Universal Waste Labeling

Ecology designates certain wastes as "Universal Wastes." **Spent batteries** (including lead-acid, alkaline, lithium, nickel-cadmium, nickel metal halide, mercury containing batteries), **lamps** (including fluorescent, compact fluorescent, high pressure sodium, metal halide, and mercury vapor lamps), and **mercury containing equipment** all fall into the category of Universal Wastes.

These wastes must be labeled "Universal Waste," and must identify the type of universal waste, hazards, an accumulation start date, and (for lamps) the number of individual lamps in the package.

WSUTC uses "Big Green Box" for disposal of batteries. Pre-labeled disposal boxes are located in the Floyd break/mail (Floyd 116) and in the Wine Science Center break room (room 229). Lithium batteries, such as those from laptops, and 9V batteries must have the metal contact points covered by non-conductive tape before being placed in the box. EH&S monitors and ships this box when it becomes full, or when its disposal date approaches.

Similarly, lamps and bulbs are collected in pre-labeled boxes by Facilities Maintenance, and are regularly transferred to EH&S for shipment

Mercury-containing equipment, when encountered, must be reported to EH&S using the procedures for disposal of Dangerous Waste (Section 6.0).

6.0 DISPOSAL OF DANGEROUS WASTE

Most wastes generated at WSU Tri-Cities are containerized and shipped to disposal facilities around the country. A few waste streams can be discharged to the drain, or can be treated before discharge. WSUTC EH&S will review the wastes being generated to determine whether any are eligible for treatment or discharge.

6.1 Disposal – Chemical Collection Requests (CCRs)

Dangerous wastes must be reported to EH&S for collection and disposal when:

- A waste container is full (allow headspace of at least 10% of the container volume).
- It is determined that no more waste will be added to the container.
- It is determined a chemical will no longer be used.
- An unknown chemical is discovered. Unknowns must be reported immediately to WSUTC EH&S.
- When the SAA waste quantity limits are reached:
  - ≥2.2 lb of an Acutely Hazardous Waste is accumulated[4]
  - ≥55-gallons (total) of hazardous waste is accumulated.

Reporting of wastes ready for collection is done exclusively via an online form, the Chemical Collection Request. It is located on the WSUTC EH&S website at http://tricities.wsu.edu/safety, or can be reached directly at http://customforms.tricity.wsu.edu/collectionrequest.

Upon completing and submitting an online CCR, the system will provide a completed label, which can be printed and applied to the waste container(s). Note that these labels can be scaled down for smaller bottles. If the bottle already has a compliant label, simply transfer the CCR number to the label. Note that this number is *required* for disposal – it provides a unique and traceable container identification.

Completed CCRs are delivered to WSUTC EH&S electronically, and scheduled for collection. The electronic file then provides the complete inventory of wastes located in the Central Accumulation Area

How to fill out the Chemical Collection Request form:

GENERATOR

Full Name:	Enter the first and last name of the person responsible for the waste. This must be the person who physically generates the waste and is able to answer questions about it, not the PI or supervisor.
E-mail:	E-mail address of the person named above
Phone:	Phone number of the person named above

LOCATION OF WASTE

Building:	Select the campus building in which the waste is located (Tri-Cities only)
Room:	Enter the room number where the waste is located

WASTE DESCRIPTION

Constituents:	Enter each waste component on a separate line. All compounds in the waste must be identified (including water). If the waste contains more than 10 constituents, contact WSUTC EH&S.
Percentage:	For each constituent, enter its percentage of the total waste. Percentages must total 100%
Hazards:	Identify the hazards associated with the waste, based on your knowledge, testing, or information from the manufacturer's label or SDS. Check all that apply.

[4] "Acutely hazardous waste" means dangerous waste sources F020, F021, F022, F023, F026, or F027, and discarded chemical products that are identified with a dangerous waste number beginning with a "P".

Physical State:	Indicate whether the waste is solid, liquid, or gas.

CONTAINER DESCRIPTION

Number of Containers:	Record the number of containers of this waste. Containers with the same waste, which are the same type and size, can be combined on a single CCR number. Containers of varying type and size must be reported separately.
Size:	Record the container size – numbers only. For example, for a 4-liter bottle, simply enter 4
Units:	Select the appropriate unit of measure for the container size.

ADDITIONAL INFORMATION

Use this field to record any other information regarding the waste, such as a precise location in a room, its pH, access limitations, etc.

For generators who have a large number of wastes to collect, contact WSUTC EH&S for assistance. Large numbers of containers can be reported using an Excel spreadsheet, rather than multiple form submittals.

6.2 Requesting Disposal by Discharge to Sanitary Sewer and Storm Water System

WSU Tri-Cities holds an Industrial Wastewater Discharge Permit from the City of Richland, and any discharge must meet the conditions set by that permit. Discharge of any material other than soap & water is prohibited unless approved by WSUTC EH&S.

Discharge approval can be obtained by submitting the "WSU Tri-Cities Discharge Approval Form". EH&S will review each form for compliance with permit limits and will approve or deny them on a case-by-case basis. Approvals will be issued in writing, and must be maintained at the point of discharge. Approvals are specifically and exclusively applicable to the exact material described in the approval. Any changes to that material will require a new approval before discharge may occur. Unauthorized discharges could result in penalties, and may impact operations and research. If any unauthorized discharges to are observed, call immediately 509-372-7234. WSUTC EH&S personnel will investigate, remediate, and report the discharge to the Department of Ecology as necessary.

Discharges to WSUTC stormwater systems are prohibited, and are regulated under the WSU Tri-Cities Stormwater Management Plan and stormwater permit issued by the Department of Ecology. Any suspected discharges to stormwater drains on campus must be reported to 509-372-7234 immediately. Such discharges may be considered criminal violations.

6.3 Wastewater Treatment

Sometimes a waste material can be "pre-treated" by certain methods that will render the waste acceptable for sewer drain discharge. Only specific methods are allowed by Ecology under the "Treatment by Generator" (TBG) Rule, and must be preapproved by WSUTC EH&S. Some common methods allowed include: elementary neutralization; filtration; carbon adsorption; separation; solidification/stabilization; and evaporation (water only).

Detailed records of any TBG activity are required. A Waste Treatment Log is required to be maintained at the location of treatment activities. This log is to be provided to WSUTC EH&S each calendar year for inclusion in the campus' Annual Dangerous Waste Report

Contact WSUTC EH&S if you have wastes which may be subject to treatment.

7.0 COLLECTION OF DANGEROUS WASTES FOR TRANSFER TO THE CENTRAL ACCUMULATION AREA

Collection and consolidation of waste containers in the central area is completed by EH&S. In order for the collection to be efficient, it is important for the generator to coordinate with EH&S in advance, and be thorough in meeting all labeling and reporting requirements.

Upon receipt of a Chemical Collection Request (CCR) EH&S will contact the generator if information is unclear. If the information is complete, the container(s) will be collected and transferred to the Central Accumulation Area within 3 days.

- When collecting/handling waste, at the minimum, the following personal protective equipment (PPE) must be used: Safety eye wear, disposable nitrile gloves and a lab coat. Depending on specific conditions, other PPE may be required.
- Each container must be assessed before transporting to the Central Accumulation Area, for each of the following: integrity, compatibility with the waste, proper labeling, secure lids, outside contamination, and reasonable headspace. Containers that do not meet any one of these requirements will not be collected. Notify the generator of any deficiencies so that they can be corrected.
- Secondary containment or other transfer devices are required for all chemical transport and incompatibles need to be separated.
- When using the elevator, do not allow other personnel into the car. Ask them to wait until you have exited.
- At the Central Accumulation Area, the weight of each container is recorded, its destination indicated (bulk drum, lab pack, neutralization, etc.). Place containers in appropriate cabinets based on their hazard classification. Solids are placed on the upper shelves and liquids below where possible.
- All containers in cabinets should be placed so that their labels are readable upon opening the cabinet doors.
- Maintain an inventory by placing the completed list of CCRs in a binder located in the accumulation area. Be sure to completely cross out any containers which were not collected due to container and/or labeling issues.

8.0 CENTRAL ACCUMULATION AREA PROCEDURES

Operation and management of the Central Accumulation Area is the responsibility of WSUTC EH&S. Access to this area is limited to authorized and trained individuals. Waste materials can only be received by WSUTC EH&S, and cannot be accepted into the CAA unless they meet all of the labeling requirements in Section 5.0, and have been added to the CAA inventory.

Upon being accepted into the CAA, the date of collection and weight of each waste must be recorded on the CAA inventory sheet. A disposal option must also be recorded. Typical disposal options include:

- ORG: Bulk Organic wastes – liquids with a significant organic component, such as alcohols and laboratory solvents. High and low pH solutions are generally allowable, but may require revision of waste profiles for acceptance. Wastes containing heavy metals or D-listed solvents should not be added to the ORG stream until evaluated against the waste profile and determined to be acceptable. These wastes are typically sent for incineration.
- AQ: Bulk Aqueous wastes – Typically consists of liquids with little organic component (less than approximately 5% total), and acidic or basic solutions mixed with various toxic salts. High and low pH solutions are allowable. Wastes containing heavy metals or D-listed compounds must be evaluated against the waste profile before being added to the AQ stream. These wastes may be sent for incineration or wastewater treatment, depending on their precise contents.
- LP: Lab Pack wastes – Wastes which are not eligible for disposal in a bulk drum, due to their characteristics. All waste solids will be lab packed. Liquid wastes may also be lab packed if they are strong oxidizers, if they are reactive, particularly toxic, highly odorous, or if they contain heavy metals or other compounds which prevent them from being placed in a bulk waste stream. Common examples of materials which will be lab packed include hydrogen peroxide solutions, mercury wastes, and solid salts.
- TRT: Treatment – clean acid and base wastes mixed with water and no other constituents can be neutralized and discharged to sewer. Chemical names and quantities of materials neutralized must be recorded, with the date of discharge and the final pH of the waste. Additionally, chemicals being neutralized must be reviewed prior to discharge to ensure that reaction products do not produce toxic criteria wastes ineligible for discharge. (Note: some wastes received do not designate as Dangerous Waste, but still require neutralization prior to discharge. For this purpose, the starting pH of all containers destined for TRT must be recorded.)

Approximately 80% of WSUTC wastes are placed in the bulk waste streams (ORG and AQ). These options require less time to prepare waste shipments, and have lower disposal costs, so they are typically the preferred disposal option. However, all wastes must be carefully reviewed prior to being assigned to one of these alternatives in order to ensure that they will not violate the waste profiles established with our disposal contractor, and (more importantly) to ensure that they will not react with other wastes and create unsafe conditions on campus or in another waste handling facility.

8.1 ACCUMULATION TIME LIMITS

There are regulatory time limits on accumulating hazardous waste; therefore it is important to track waste accumulation times. WSUTC typically qualifies as a Medium Quantity Generator (MQG), and has a 180-day limit on accumulation of wastes. The Wine Science Center is typically a Small Quantity Generator (SQG), which has no accumulation time limit. However, a single container of Acutely Hazardous Waste can turn either facility into a Large Quantity Generator, with a 90-day accumulation time limit.

When the first waste container is placed in the CAA, determine the required shipment date by adding 180 days (or 90 days for acutely hazardous wastes) to the date on the container label. Post this date in a conspicuous location in the CAA.

Universal wastes must be shipped for disposal within one year of accumulation. This date must be marked on each container of Universal Waste.

When PCB wastes greater than 50 ppm are collected, they must be shipped off-site within one year from the "Out of Service" Date.

8.2 CENTRAL ACCUMULATION AREA WEEKLY INSPECTIONS

WSUTC EH&S conducts weekly inspections for the Central Accumulation Areas when hazardous wastes are present using the "Weekly Inspection Checklist" form found in Appendix A. The inspection forms are maintained in a binder in a conspicuous location in the central area.

- If there is a discrepancy during an inspection EH&S will correct the issue, or arrange for its correction, immediately. When the discrepancy has been resolved, the date and corrective action will be noted on the original copy of the inspection form and initialed by EH&S.
- The inspection sheets must be retained for 5 years.

8.3 GENERAL FACILITY INSPECTIONS

WSUTC EH&S will conduct inspections of each facility associated with a CAA on an ongoing basis. Inspections will be performed and documented weekly using the Weekly Inspection Checklist created by the Department of Ecology.

If there is a discrepancy during an inspection EH&S will contact the users of the space where the issue is found and provided guidance on how to correct it. If the issue poses a threat to safety or a potential release of hazardous material, EH&S staff may correct the issue immediately.

9.0 HAZARDOUS WASTE SHIPMENT PROCEDURE

WSUTC EH&S monitors the accumulation dates and shipment deadlines.

- Approximately six weeks prior to a waste shipment deadline for the central area, WSUTC EH&S makes shipment arrangements with the appropriate waste disposal contractor. Alternatively, based on waste volume, shipments may be arranged on a regular cycle of 3-4 months.
- EH&S may, at their discretion, notify generators of the scheduled shipment and request that they submit any wastes for collection.
- EH&S collects all wastes submitted for disposal at least two days prior to the shipment date. No wastes shall be collected from SAAs for two days prior to the shipment. This restriction may be waived at the discretion of EH&S, once shipment preparation is complete.
- EH&S provides disposal contractors access to the central area, showing them the location of all wastes going out for disposal, and familiarizing them with the location of the nearest phone, emergency shower and eye wash unit, and fire extinguisher, as well as exit routes. A briefing of the 911 dialing instructions and other emergency numbers on the Hazardous Waste Emergency Contact sign is done.
- EH&S ensure the **disposal contractor**:
  - Reviews all waste ready for disposal.
  - Only packages containers that have a WSU CCR number on them. If no CCR number is present, the contractor is to bring this to the attention of WSUTC EH&S, who will provide further instruction
  - The contractor writes the WSU CCR number for ***every*** lab pack container on the contractor's drum inventory sheets. Each individual bulk drum and lab pack must have an inventory sheet clearly indicating what containers were placed inside.
- Once all waste has been packed, EH&S inspects the waste storage cabinets and area to make sure all wastes have been packaged and no spills occurred
- EH&S inspects each drum and lab pack container, verifying labeling of containers and placarding of the transport vehicle, reviews manifests for accuracy, and signs the paperwork before the contractor leaves and the paperwork is distributed.

- WSUTC EH&S staff are the only personnel authorized to sign the manifest, other shipping papers and the time and materials sheet.
- The waste shipment's original manifest, Land Disposal Restrictions (LDRs), contractor's Time and Materials sheet, and drum inventory lists, and the CAA inventory list, are placed in a file dated for the shipment and placed in the location's central hazardous waste file.
- If any containers have remained in the CAA after shipment, the accumulation time limit must be re-calculated based on the date of the oldest container. The CAA inventory must be updated to reflect any containers left behind.
- Note the date of the shipment on the Weekly Inspection Log. If all wastes were removed from the CAA, indicate this on the log.
- The original manifest signed by the final receiving facility, must be received by WSUTC EH&S within 45 days of the shipment. Place this into the shipment file. If it has not been received within 45 days, WSUTC EH&S must contact the disposal contractor to obtain a copy ASAP. If a copy is not received, this must be reported as a violation.

10.0 HAZARDOUS WASTE RECORDKEEPING

There are specific documentation requirements for hazardous waste shipment and disposal that must be closely adhered to.

The hazardous waste files for the main campus are located in WSUTC EH&S office, BSEL 129. For the Wine Science Center, they are located in the Central Accumulation Area in room 130

The central files must contain the following for wastes shipped off site for disposal:

- Manifest paperwork for each waste shipment, the signed returned manifest, certificates of disposal (CD), and the inventory of materials shipped.
- Annual Dangerous Waste reports submitted to Ecology.
- Exception reports, if any.
- Analytical data/testing for any waste that has been required.
- Current CAA inventory
- Central Accumulation Area inspection records
- Waste treatment records (neutralization logs)

Hazardous waste manifest and shipment records must, by law, be retained on site for a minimum of 5 years.

WSUTC EH&S audits the central files annually for completeness.

11.0 WASTE DESIGNATION

The Department of Ecology regulates all hazardous wastes in Washington State. In addition to the listed and characteristic wastes defined by the U.S. Environmental Protection Agency (USEPA), this includes Washington State "Criteria" wastes are defined by WAC 173-303. All wastes must be designated, meaning that they must be evaluated to determine whether they meet the definition of "hazardous" under federal and state regulations.

When planning projects or experiments, generators must determine whether hazardous waste will be generated, and ensure that it is collected, identified, and disposed of in a proper manner. All generators must attend Hazardous Waste Generator training prior to receiving keys for laboratory access or working on waste-generating processes. This training includes additional information regarding proper waste designation. Generators can also contact EH&S for assistance with waste designation.

In order to determine whether wastes are hazardous EH&S will require the following information:

- All constituents of the material, and their approximate concentrations. If a trade name such as Wonderclean is being disposed, the actual chemical names of the ingredients can be obtained from the container label or Safety Data Sheet
- The physical state of the waste material.
- If the material is unused product (primarily applicable to research chemicals and pesticides)
- The volume of waste, the container size and type
- Waste generation rate and if it is constant, periodic, batch or continuous.
- If it is corrosive, the pH is helpful.
- Safety Data Sheet for the chemical(s)

It is best to have this done prior to generating the waste so that proper containerization, storage, and possible alternate chemicals, methods, or treatment options can be discussed.

12.0 TRAINING

Performing different tasks/responsibilities related to hazardous waste management requires varying forms of training.

Waste Generator: All personnel working in the labs need to take and pass the hazardous waste generator training *annually*. This training includes: basic waste designation, container selection and labeling, satellite accumulation requirements, personal protective equipment, procedures for waste reporting, and emergency procedures.

WSUTC EH&S (Emergency Coordinator): All EH&S employees are appropriately trained for waste handling duties relevant to their position. These include: waste designation, container selection and labeling, waste collection procedures, chemical hazards and incompatibilities, requirements for Satellite Accumulation Areas and Central Accumulation Areas, waste reporting and collection procedures, record keeping requirements, Hazard Communication, personal protective equipment, container management procedures, emergency procedures in the event of a fire, explosion, spill or other release, WSU hazardous waste procedures, and pertinent U.S. Department of Transportation regulations.

13.0 SPECIFIC PROCEDURES

13.1 FLUORESCENT LIGHT BALLAST DISPOSAL

Fluorescent Light Ballast Disposal Procedure

This procedure is to ensure fluorescent light ballasts are properly processed for disposal on the WSU Tri-Cities campus. This will cover how to package, label, document, store, and safely handle the ballasts. PCB containing materials are regulated by both the EPA and Washington Department of Ecology.

Ecology regulates PCBs at lower levels than EPA, so labels on individual ballasts that indicate they contain no PCBs may still be regulated in the State of Washington. Following these procedures is necessary to be in compliance with requirements.

The following guidance was developed by WSU Pullman, using data from sampling conducted there:

- Light ballasts that are marked "PCB-free" or "No PCBs" do not contain regulated concentrations of PCBs, and may be recycled.
- Ballasts marked "Non-PCB" may contain regulated concentrations of PCBs and must be managed as hazardous in accordance with the procedure below.

Facilities Personnel

Removing Ballasts:

1. As soon as they are removed from service, mark ballasts with the date removed from service and place them into the designated drums located in East building maintenance shop or in the Central Accumulation Area located in BSEL room 151. **Be sure the lid of the drum is back on after placing the ballasts in the drum**. Labeling is provided by WSUTC EH&S on the drum in the BSEL accumulation area. If ballasts are stored elsewhere, contact WSUTC EH&S.
2. The out-of-service date of the first ballast must also be written on the drum.
3. If the drum becomes full, or when it approaches 1 year from the oldest out-of-service date, notify WSUTC EH&S immediately.
4. If a ballast is observed to be leaking, or has signs of previous leaking such as a stain, do not handle it until you have proper protection and supplies to handle it. Wear nitrile gloves to handle the ballast. After removal, place it in a clear plastic bag and seal the bag tightly. Use a paper towel or rag to wipe up any oil on the fixture or elsewhere. Place the gloves and rags into another clear plastic bag and seal. Notify WSUTC EH&S of the leaking ballast.

WSUTC EH&S Personnel

1. Provide an open-top drum for accumulation of light ballasts. The drum must be labeled as follows:
    a. End of Service label on the side of the drum showing out to the front.
    b. "Keep Lid Closed" label must be on top of the lid.
    c. Hazardous Waste Label affixed to the side of the drum.
2. When full, complete an Online Chemical Collection Request form for the drum, and attach it to the top of the drum.
    a. Assign a unique inventory number.
    b. Enter the date the container was filled.
3. When contacted by Facilities that ballasts are being placed in the drum for the first time
    a. Ensure the "Out of Service Date" was properly placed on that label. If not contact Facilities to obtain the date and place it on the label.

b. Check to make sure lid is closed and no leaking ballasts are present.

c. Place a date 9 months out from the "Out of Service" date on the Shipment Date Compliance Sign posted on a storage cabinet, and note for PCB disposal.

4. When contacted by facilities that the drum is full, that day:

    a. Complete the CCR and Hazardous Waste Label with the "Container Filled Date" and seal drum.

    b. Start a new drum if not already done.

5. When contacted by Facilities that a leaky ballast has been deposited in storage, that day:

    a. Label the bagged ballast(s) and any cleanup materials with a hazardous waste label, and complete an entry on the CCR attached to the top of the ballast drum.

    b. Place the ballast(s) in the appropriate storage cabinet.

6. Inspect the drum during weekly inspections to ensure everything is in compliance. Start a new drum when the existing one is near full.

13.2 UNIVERSAL WASTE LAMPS

Compact fluorescent lamps (CFL), high intensity discharge (HID). high pressure sodium (HPS) bulbs and fluorescent light tubes must be collected for proper recycling. Incandescent and LED bulbs do *not* have to be collected.

Different bulb types should be collected in separate boxes, if possible.

Original bulb packaging can be used only if the box remains intact.

Accumulation boxes must:

- Be labeled when the *first* bulb is placed inside
- Have an accurate count of the number of bulbs
- Be securely closed except when bulbs are being added

Collection boxes must be labeled with the words "Used Lamps", "Universal Waste Lamps", or "Waste Lamps", and the date the first lamp is placed into the box.

Collection boxes must be kept taped shut except when adding or removing waste. Any box that can be taped shut and has integrity may be used for the collection of CFL, HID, HPS and FLT.

If a bulb is broken, properly trained staff can clean them up as follows:

a. Wear proper protective equipment: Normal work attire with disposable gloves

b. Sweep up broken glass, lamp components, and lamp phosphor (the white powder inside) and place into a plastic bag. A damp towel may be used to clean up remaining phosphor. Place any damp towels and used gloves into the plastic bag. Do <u>not</u> vacuum up the debris.

c. Dispose of the cleanup material as dangerous waste, including proper labeling.

Collection boxes must be kept in areas under the control of trained staff (i.e. mechanical rooms, storage rooms, janitorial closets, etc.) that are locked. The public should not have access to collection boxes unless a trained staff member is present.

Staff who will place CFL, HID, HPS or FLT into collection boxes must be trained to observe the above procedures. This is all the training that is required.

Once full, collection boxes must be removed from campus within one year.

13.3 USED BATTERY DISPOSAL AND RECYCLING

WSUTC uses "Big Green Box" for disposal of batteries. Pre-labeled disposal boxes are located in the Floyd mail/break room (Floyd 116) and in the Wine Science Center break room (room 229).

The disposal box is pre-labeled with all required information, and must be marked with the date the first battery is placed inside. The box must be closed and shipped for disposal within 1 calendar year of this date. EH&S monitors and ships this box when it becomes full, or when its disposal date approaches.

The following restrictions must be observed:

- If a battery is contaminated on the outside, place it in a small plastic bag before placing into the collection container. If there is already a bag with contaminated batteries in the collection container, add it to that bag.
- Lithium batteries, such as those from laptops, and 9V batteries must have the metal contact points covered by non-conductive tape before being placed in the box. Similarly, lithium "button" batteries must be wrapped in non-conductive tape before being placed in the box.
- Large wet-cell batteries (typically lead-acid or gel cell batteries) cannot be placed in the box. Report these batteries on a Chemical Collection Request. EH&S will collect and manage them as Universal Waste through a disposal contractor.
- Leaking and corroded batteries cannot be placed in the Big Green Box, they should be reported as waste using the Chemical Collection Request.

13.4 MANAGEMENT OF PEROXIDE FORMING COMPOUNDS

Some solvents can form dangerous levels of peroxides during storage, through a process called autoxidation. This can occur upon exposure to air, heat, light, or simply with passage of time. Elevated concentrations of peroxides may become sensitive to heat, friction, or shock and become explosive. The danger is increased when a peroxide forming chemical is concentrated by distillation or evaporation.

Due to the risk of explosion, disposal contractors will not accept peroxide-forming compounds outside of their shelf life, unless they are stabilized. Stabilization of old, out-of-date compounds is very expensive, and must be avoided.

In order to prevent accumulation of peroxide-forming compounds, the following purchasing practices must be implemented:

- Purchase only what will be used completely before the end of the storage time limit for that category of material. (See the table below of peroxide forming risk and retention time)
- Purchase factory-inhibited materials whenever possible. In many cases, manufacturers add stabilizers or inhibitors that slow peroxide formation within the solvent's shelf-life.
- Tracking and storage of containers to ensure safety:
    - When purchasing a peroxide forming chemical, inform WSUTC EH&S of the purchase. EH&S will then label the container and add it to a tracking database.
    - When the container is first opened, write the "Date Opened" on the container.
    - Use the oldest stock on the shelf first until it is all used up. Rotate stock to prevent stock exceeding its disposal date.
    - Store peroxide-forming materials in the original manufacturer's container when possible. If it is necessary to use a different container, use one that is opaque and does not have a glass stopper or metal lid. These materials must be stored in tightly closed containers to eliminate evaporation and decrease contact with air.
    - Store material in a safe environment away from heat, light, and ignition sources. Containers must be protected from physical damage.
    - Periodically review the inventory to ensure material is used up or disposed of in the required time limit.

- When a container becomes empty, notify WSUTC EH&S

- Notify EH&S of any material which is approaching its shelf life. This will allow time to either dispose of the material prior to its expiration, or add inhibitor to the compound if it will still be used. Failing to monitor this may require that the container be stabilized prior to disposal, at a significant cost.

Proper handling of peroxide forming materials:

- Do not allow containers to evaporate to dryness. Rinse empty containers with water, label as "Empty" and dispose of in the trash with the lid removed.
- Peroxide-forming materials must not be opened after the manufacturer's expiration date or after the storage time limit has been reached (see chart). These materials must be disposed of as dangerous waste. Contact WSUTC EH&S for assistance.
- If a viscous liquid or crystalline solid is observed in the material or around the cap, do not open, do not touch the container lid, or attempt to move the container. If already open, do not reseal. Immediately call WSUTC EH&S for assistance. Place a warning sign near the container (do not touch container) describing the potential explosion hazard, and include the date and contact person.
- Do NOT distill peroxide-forming chemicals. This removes any peroxide inhibitors.
- Any container discovered that has been stored past its storage time limit must be reported to WSUTC EH&S immediately. WSUTC EH&S will make arrangements for the container to be evaluated, tested, stabilized, and certified for peroxide levels by an approved contractor.

Organic Peroxide Forming Compound Storage Time and Disposal

Peroxide-forming compounds are typically classified into three categories on the basis of peroxide formation susceptibility.

Group I materials are the most hazardous, and can spontaneously form peroxides in storage, even without concentration. These materials typically have a shelf life of no more than 3 months, meaning that they must be stabilized, inhibited, or consumed within 3 months of purchase. Some examples of Group I materials are:

Chemical	Synonyms
Isopropyl ether	Disopropyl ether, Disopropyl oxide
Potassium metal	Potassium
Vinylidene chloride	1.1-dichloroethylene, 1.1-dichloroethene

Group II materials typically form peroxides on concentration, as the solvent evaporates (including distillation). This can occur as the material is consumed, and a small amount is left in a large container. These materials, when inhibited, have a shelf life of 1 year. Uninhibited, they have a shelf life of 3 months. Examples include:

Chemical	Synonyms
p-dioxane	1.4-dioxane, diethylene-dioxide
Ethyl ether	Ether, diethyl ether, ethoxyethane
Tetrahydrofuran	Butylene oxide, diethyleneoxide
Cyclohexene	1.2.3.4-tetrahydrobenzene

Group III materials may autopolymerize as a result of peroxide formation. Shelf life of these materials is the same as Group II. Examples include:

Chemical	Synonyms
1.3-butadiene	Vinylethylene, divinyl
Vinyl acetate	
Vinyl chloride	Chloroethylene, ethylene monochloride

These lists are not exhaustive. Check the Safety Data Sheet (SDS) of your chemical to determine if it forms peroxides. If so, there will be a warning under the heading Precautionary Labeling or Fire and Explosion Hazard Data on the SDS (section 2- Hazards Identification).

If a substance does not appear on the lists and the SDS does not indicate that it is a peroxide former, but you suspect that it is a peroxide former, evaluate the molecular structure of the chemical for peroxide forming functional groups and the chemical families of common peroxide formers below:

Organic Materials	Inorganic materials
Acetals Ethers Olefins with allylic hydrogens, chloro- and fluoroolefines, terpenes Dienes, vinyl acetylenes Aldehydes Ureas, amides, lactams Vinyl monomers including vinyl halides, acrylates, methacrylates, and vinyl esters	Alkali metals, particularly potassium Alkali metal alkoxides and amides Organometallics

13.5 FACILITIES OPERATIONS/MAINTENANCE WASTES

Maintenance activities such as vehicle and equipment repair, painting, pesticide applications, construction projects may create hazardous wastes regulated by the State of Washington which need to be handled as described in this procedure. Never dispose of shop fluids in storm drains, septic tanks, dry wells, dumpsters, or sewer.

Recyclable materials:

When feasible, recycling materials in lieu of disposal, is a more cost effective and environmental friendly option for handling spent materials. Contact WSUTC EH&S with any questions regarding a waste material and the options for disposal. If a local source for recycling or disposal is used, contact WSUTC EH&S prior to using that source. All disposal and recycling sources must be approved by WSUTC EH&S.

Recyclable materials must be stored separately from hazardous wastes. Label the area: "Used Shop Materials for Recycle." Note, the word "waste" is not used in the labeling of recyclable materials. Recyclable shop fluid accumulation areas need to be inside the shop and in control of the generator. Fluids that become contaminated with chlorinated products, solvents, and metal working fluids must be treated as hazardous waste. Only trained and authorized staff place fluids into recycle/waste containers.

Recycling records are maintained with the hazardous waste files (file all bills of lading). Provide copies to WSUTC EH&S.

Light ballasts from fluorescent light fixtures require disposal as a hazardous waste. Specific procedures for processing and accumulation of these materials for disposal are covered in Section 13.1 Fluorescent Light Ballast Disposal Procedure.

The following materials need to be collected for recycle, special handling, or hazardous waste disposal. For more information, refer to the Ecology "Guide for Automotive Shops" which is posted on the Ecology website.

SPENT MATERIAL	ACTION	LABEL	WASTE DESIGNATION
Lead-acid batteries	Recycle with vendor or other vendor	"Spent Batteries for Recycle Caution Corrosive"	Recycle or hazardous waste if can't recycle
Batteries other than lead acid	Recycle through vendor or dispose as hazardous waste	Use Universal Waste label	Universal waste
Oil filters	Drain filters for 24 hours & recycle	"Used Oil Filters for Recycle"	Recycle or local landfill (approval needed)

Transmission filters	Drain filters for 24 hours & recycle	"Used Transmission Filters for Recycle"	Recycle or local landfill (approval needed)
Fuel filters	Manage as hazardous waste	Use hazardous waste label	Hazardous waste
Vehicle oil	Recycle with approved local vendor if they contain no chlorinated products or solvents	"Used Oil for Recycle Caution Combustible"	Recycle or hazardous waste-designation depends on generator procedures
Transmission oil, gear oil, hydraulic fluid, differential fluid	Recycle with used oil if they contain no synthetic or chlorinated products or solvents	See used oil	See used oil
Brake & Power Steering Fluid	Dispose of through hazardous waste vendor	Use hazardous waste label	Hazardous waste
Antifreeze	Recycle through approved local vendor	"Spent Antifreeze for Recycle Caution Toxic"	Recycle or hazardous waste-designation depends on generator procedures
Parts cleaner	Research solvent alternatives OR dispose of through hazardous waste vendor or recycle through supplier	Depends on product	Non-hazardous waste, reduced hazardous waste or hazardous waste depending on product selected & generator procedures
Carb cleaner	Dispose of via hazardous waste vendor	Use hazardous waste label	Hazardous Waste
Shop Towels/Wipers	Dependent on generator treatment of towels-read DOE literature concerning shop towels in appendix B	Dispose of in UL flammable can in shop/Label: "Contaminated Shop Towels Combustible"	Launder, landfill or hazardous waste-designation depends on generator procedures
Solvents/Paint Thinners	Dispose of through hazardous waste vendor	Use hazardous waste label	Hazardous waste
Aerosol cans (empty or containing paint)	Dispose of through hazardous waste vendor	Use hazardous waste label	Hazardous waste
Metals	Local recycling vendor	Store under cover/Label area "Metals for Recycle"	Recycle
Spent tires	Landfill or find local recycler	Store under cover	Recycle or Landfill
Oil Water Separator sludge	Pump sludge via local approved vendor	NA	Non-hazardous or hazardous waste designation depends on generator procedures
Shop floor wash water	Seek permission from WSUTC EH&S to put down drain	NA	Non-hazardous or hazardous waste designation depends on generator procedures
Floor Sweep (spill clean-up)	Dependent on product & spill	Dependent on spill	Hazardous waste
Fluorescent lights & other mercury containing equipment	Recycle through hazardous waste vendor or local recycler or check with local landfill	Use Universal waste label	Universal waste
PCB containing equipment including transformers	Dispose of through hazardous waste vendor or vendor designated by WSUTC EH&S	"Caution PCB Containing Equipment Toxic"	Hazardous waste (TSCA rules apply)
Paint	Recycle or dispose of via hazardous waste vendor	"Paint for Recycle" or use hazardous waste label	Recycle or hazardous waste
Pesticides	Dispose of through vendor who sold product, WSDA event, or hazardous waste vendor	Use hazardous waste label	Hazardous waste

13.6 COMPUTER AND ELECTRONIC WASTE

Lead and precious metals in computers preclude discarding of monitors, printers, and electronic devices with circuit boards into landfills. This equipment is to be surplused via WSU Pullman or other vendors approved by WSUTC EH&S for proper disposal through a licensed waste/recycle vendor.

13.7 PESTICIDES

Unused pesticides for research or classroom use that are provided to WSU by manufacturers, distributors, or field representatives need to be returned to suppliers when projects are finished. This practice not only saves the University money and storage room, but also prevents unnecessary waste generation. A written agreement with the supplier must be obtained before receiving the material that commits the supplier to take back the unused material. Before accepting any pesticides work out return logistics. If a company representative wants to leave a sample, ensure the rep will take back any excess sample before accepting it.

Control pesticide inventory by only receiving the amount needed for the season, request suppliers repackage pesticides accordingly. Arrange for suppliers to send additional small amounts of product, if the initial estimates prove inadequate.

Mailing/shipping Pesticides: Mail back pesticides in the same shipping containers they were sent in (requires the containers be saved). If pesticide is mailed, have the company confirm and/or provide the necessary shipping labels, hazard labels, bill of lading, and packaging. DO NOT mail improperly packaged or labeled pesticides as there are large monetary fines possible when hazardous materials are not packaged per DOT shipping regulations; contact WSUTC EH&S for assistance.

14.0 HAZARDOUS WASTE SECURITY

14.1 Hazardous Waste Central Accumulation Area Security

The Central Accumulation Areas in BSEL 151A, Collaboration Hall 116A, and Wine Science 130 are kept locked at all times. Keys are issued only to authorized personnel. Trash is emptied by WSUTC EH&S.

14.2 Hazardous Waste Shipment Security

The University contracts with the State of Washington's Hazardous Waste Vendor for hazardous waste disposal. This vendor is selected by the State after a rigorous investigation and selection process. By law, the vendor is required to develop a security plan to help ensure safe shipment of its various clients' waste.

To help ensure safe shipments of University waste WSUTC EH&S inspects the integrity of the containers and lids, supervises waste packaging prior to shipment, confirms identity of contractor personnel, monitors loading of waste into contractor vehicles and DOT signage on the vehicle. WSUTC EH&S obtains certificates of disposal (CDs) on all hazardous waste shipments. The majority of wastes are incinerated.

15.0 EMERGENCY PROCEDURES

15.1 Summon Help

Call 911 for any emergency which involves a threat to life or health. Otherwise call 372-7234. Other emergency contact numbers are listed on the Hazardous Waste Contingency Numbers sheet posted by the phone.

15.2 Fire

Both Central Accumulation Areas are equipped with automatic sprinkler systems, and fire extinguishers are located outside their doors. Fire alarm pull stations are located in the southwest entryway to BSEL, and near the south doorway of the Wine Science Center.

15.3 Chemical Exposures

There is an emergency eyewash and shower located inside each Central Accumulation Area. Flush eyes and/or body for a minimum of 15 minutes. The nationwide poison control number is 800-222-1222.

15.4 Chemical Spills

In the event of a chemical spill, call WSUTC Emergency number 509-372-7234. If a spill is in the BSEL building, also call the PNNL Dispatcher number 375-2400 to inform their personnel of the incident. If the spill requires evacuation of the building, follow emergency procedures in WSUTC Comprehensive Emergency Management Plan.

An Environmental Spill Response Contractor is available for 24- hour spill response in the event this type of response is warranted. Contact Scott Tomren (Emergency Coordinator) 509-372-7234; or EH&S Pullman 509-335-3041.

Releases to the environment must be reported immediately to the following outside agencies:

- Washington Emergency Management Division: 1-800-258-5990 -OR- 1-800-OILS-911

- Ecology Central Regional Office: Central Regional Office - 1-509-575-2490
- National Response Center: 1-800-424-8802

The Central Accumulation Areas are designed with sumps to catch any spilled materials. There are no floor drains in the building.

Chemical spill clean-up equipment and supplies are located in the Central Accumulation Areas.

Only WSUTC EH&S personnel are authorized to clean up spills in the Central Accumulation Areas. People untrained to respond to chemical spills must not attempt to clean up the spill. Close the door and get experienced help on the way.

Complete a Spill Cleanup Report when event is completed, and file the report in WSUTC Hazardous Waste records files located in the Central Accumulation Area. (See report form Section 20.10)

16.0 FORMS AND SIGNS

16.1 CONTINGENCY NUMBERS PHONE SHEET

HAZARDOUS WASTE EMERGENCY NUMBERS

FOR ANY INCIDENT INVOLVING HAZARDOUS MATERIALS, INCLUDING FIRE, EXPLOSION, OR SPILLS, CALL:

SINGLE POINT OF CONTACT (24 Hour):
509-372-7234

EMERGENCY COORDINATOR (Scott Tomren):
24 Hour: 509-372-7234
Business Hours: 509-372-7163

CAMPUS SECURITY (To help secure scene):
509-372-7698
(during campus operating hours only)

FOR EXTERNAL EMERGENCY RESPONSE (FIRE, MEDICAL EMERGENCIES, CRIME):

FIRE	
AMBULANCE	911
POLICE	
FIRE/POLICE NON-EMERGENCY	628-0333

NOTE: THIS FACILITY HAS A FIRE DETECTION SYSTEM WITH ACTIVE MONITORING. RICHLAND FIRE DEPARTMENT WILL BE NOTIFIED DIRECTLY IF A FIRE IS DETECTED.

APPENDIX A - CHEMICAL SPILL CLEANUP REPORT FORM

Chemical Spill Report & Accident Investigation

Date:		Time:	
Building/Room:		Location:	
Reporting Party:		Investigator:	
Description of Event:			
Narrative of Response:			
Date of Report		Completed By:	

Follow-up:	
Recommendations:	
Corrective Actions:	

APPENDIX B - WSUTC DISCHARGE APPROVAL FORM

https://app.smartsheet.com/b/form/815854d2ede74c08aac108c82535ad8e

APPENDIX C - LABELS

DANGEROUS WASTE

Hazard(s)
(check all that apply):

☐ Flammable

☐ Toxic

☐ Corrosive

☐ Other(describe):

CCR#: _____

Date Filled: _____

Generator: _____

Phone: _____

Constituent(s)	%

https://tricities.wsu.edu/documents/2019/01/dangerous-waste-label.pdf

For containers of 1 gallon total volume or more:

https://tricities.wsu.edu/documents/2019/01/dangerous-waste-label-for-containers-over-1-gallon.pdf