PLU Hazardous Waste Management Plan (WAC 173-303)

The purpose of the Hazardous Waste Management program at Pacific Lutheran University (PLU) is to ensure the proper management of hazardous chemical wastes generated within the university. Regulations on handling and disposing of hazardous waste are comprehensive and complex on the federal, state, and local level. To comply with these regulations, all generators of hazardous wastes at PLU must follow the procedures in this program.

Environmental Health & Safety has the primary responsibility for conducting the hazardous waste management program. However, everyone at PLU who generates or handles hazardous waste is ultimately responsible for compliance with regulations and the success of the program.

A good resource for waste disposal guidance is the Department of Ecology website (<u>http://www.ecy.wa.gov/programs/hwtr/</u>). See the Step-by-Step Fact Sheets for Hazardous Waste Generators.

Objectives

Pacific Lutheran University is committed to handling its hazardous wastes responsibly by adhering to these objectives.

- 1. Reduce the quantity of hazardous waste generated to the lowest practical level.
- 2. Manage hazardous wastes in a manner that protects the health and safety of students, staff, and faculty at PLU as well as the surrounding community.
- 3. Manage hazardous wastes using the most responsible and environmentally sound methods practical. This includes reducing the potential for releases of hazardous waste into the environment and providing quick response to hazardous waste spills to minimize risk to people and the environment.
- 4. Comply with all federal, state, and local regulations regarding hazardous waste management.

Hazardous Chemical Waste Determination

The proper management of chemical wastes begins by determining first which wastes are hazardous. "Hazardous Waste" or "Dangerous Waste" is a term defined by regulatory agencies. State and federal regulations define categories that determine whether chemical wastes are considered hazardous, and if they are regulated.

Washington State waste determinations are defined in WAC 173-303. These regulations also define the Quantity Exclusion Limits (QEL), which determine the amount of hazardous wastes that may be accumulated and the frequency of disposal required. It is the intent of this management program to follow these regulations as they apply to all hazardous wastes at Pacific Lutheran University.

Empty Containers

Containers that have held hazardous materials are not classified as hazardous wastes when they are empty. A container is legally empty if the residue is less than one inch deep or less than one percent of the total capacity of the container. However, containers of *acutely hazardous materials* (QEL of 2.2 lb.) must be triple rinsed with an appropriate solvent. Any rinse solution must be disposed as a hazardous waste. The empty container may then be discarded or recycled after the label is removed or obliterated.

Priority Waste Management

Effective chemical waste management uses priorities to minimize environmental impact of hazardous waste while meeting federal and state requirements. Priority waste management at PLU attempts first to minimize the volume of hazardous waste generated and then to manage the minimized volume of waste in the most responsible and environmentally sound manner possible.

Priority 1: Waste Minimization

The highest priority is to minimize the volume of waste generated using the following methods:

a. Substitution

Often a non-hazardous chemical can be used in place of a hazardous chemical. Similarly, different procedures may be available that do not require use of hazardous chemicals. One should look for methods and materials that decrease the hazardous characteristics or quantity of the waste that we do generate, whenever possible.

b. Scale Reduction

Microscale experimentation can be an effective procedure for hazardous waste reduction in research and teaching labs. Reducing the scale of experiments and procedures will reduce the quantity of hazardous waste produced.

c. Inventory Control

A substantial portion of hazardous waste generated at PLU consists of unused, outdated chemicals and materials. Careful planning of quantities required can reduce disposal costs of excess chemicals and reduce costs due to over-purchasing. In many cases, costs to dispose of chemical wastes are greater than the purchase price of the original material.

Departments are discouraged from purchasing new material that is already in inventory somewhere on campus and can be shared.

Purchasing the smallest volume container that will last no longer than one year is strongly encouraged.

d. Exchanges

Chemical purchases can also be reduced by borrowing and trading chemicals between laboratories, and by returning unused portions to the central stockroom for use by others. Other materials, such as paints, may be useful to other departments on campus or may be donated to community agencies or individuals. You may offer product that you would otherwise dispose through a formal exchange, such as the Industrial Materials Exchange (IMEX) at http://www.govlink.org/hazwaste/business/imex/.

Priority 2: Waste Recovery

Certain kinds of wastes can be recovered by commercial waste processing companies for repurification or use in commercial products. Waste recovery or recycling should be used whenever possible. Certain solvents, motor oil, photographic fixer, and metallic mercury will be collected and consolidated for commercial recovery and/or recycling.

Priority 3: Treatment-by-Generator

A variety of chemicals can be treated in the laboratory process to reduce or eliminate the hazardous properties. These processes must follow the Washington State Department of Ecology Treatment-by-Generator guidelines (Technical Information Memorandum No. 96-412). In-lab waste reduction methods will be used only if Priority 1 and 2 methods are not feasible.

- a. Acid-Base Neutralization
- b. Filtration
- c. Separation
- d. Evaporation

- e. Carbon Absorption
- f. Solidification

These wastes must be treated in suitable containers. Aqueous residuals must have a pH greater than 5.5 and less than 11 prior to discharge to the POTW sewer system. The precipitated solids must be managed and disposed appropriately. These methods are generally intended for small volumes of dilute wastes rather than for large quantities of unused materials. These may be especially effective when used in teaching labs as part of student and laboratory worker responsibilities.

Employees who choose to treat hazardous wastes must still mark the container with an accumulation start date. The container must be emptied every 180 days and any residue of the treatment process must be disposed within this same 180-day period.

Employees who treat hazardous wastes must maintain a written log (Appendix A) of treatment activities, including:

- a. Quantity in pounds
- b. Treatment method
- c. Date of treatment

The log must be submitted to the Environmental Health & Safety Office at the end of the calendar year for inclusion in our annual Hazardous Waste Report to the state.

Priority 4: Commercial Disposal

Hazardous materials that cannot be managed by any of the previous methods will be collected for packaging and transport by a commercial waste processing company for final disposal. The Environmental Health & Safety Office will arrange for packing and shipping.

Procedures for Hazardous Chemical Waste Disposal

All personnel handling hazardous chemicals on the PLU campus must be familiar with PLU's *Hazard Communication Program*. This program explains the rights and responsibilities associated with working with hazardous materials. Please contact the Environmental Health & Safety office for training or information on Hazard Communication.

Personnel working in non-production laboratory facilities on campus must be aware of the OSHA Laboratory Standard (29CFR 1910.1450). They must be trained according to PLU's *Chemical Hygiene Plan* to ensure awareness of the hazards of chemicals present in their workplace. Please contact the Environmental Health & Safety office for training or information on Hazard Communication.

The Department of Ecology Step-by-Step Guide to Better Laboratory Management Practices #97-431 (<u>http://www.ecy.wa.gov/pubs/97431.pdf</u>) is another very good resource. It includes information on managing laboratory wastes, minimizing wastes, and storing chemicals compatibly.

1. Accumulation Areas

Hazardous chemical wastes being held for commercial waste disposal or recycling will be stored in Accumulation areas as follows.

- Reike Science Center Chemistry stockroom
- Hazardous Waste storage facility at Facilities Management (central storage)

Wastes in the Reike Science Center will be taken to the Chemistry Laboratory Supervisor in the Chemistry Stockroom.

Other locations on campus should call the Office of Sustainability Manager in Facilities Management (x7380) and submit a work request for pick-up of hazardous wastes.

As soon as a chemical is declared a waste or removed from a satellite accumulation area, the accumulation date must be added to the label, in addition to the chemical name and hazard associated with the chemical. See Labels below.

2. Satellite Accumulation Areas

Wastes from routine processes may be accumulated at or near their point of generation before consolidation at a designated storage area. The satellite area must be under the control of the generator and secure at all times. As much as 55 gallons of dangerous (hazardous) waste or one quart of extremely hazardous waste per waste stream may be collected. When the containers are full or volumes reach these limits, containers must be immediately marked with an accumulation start date, and moved to the accumulation storage areas within *three (3)* days. Sites for satellite accumulation of used hazardous materials include, but are not limited to, the laboratories in Reike Science Center, studios in the Art Department, service areas in Facilities Management.

3. Storage Time

Because PLU is a regulated medium quantity generator of hazardous wastes, most hazardous materials cannot be held longer than 180 days in the storage areas. Acutely hazardous wastes in excess of the QEL of 2.2 lb. can be held only 90 days.

4. Containers

Each hazardous waste must be stored in containers appropriate for that material.

- a. Specific categories of organic solvent wastes can be combined into a common collection vessel. Chemically compatible solvents can be accumulated into the same container.
- b. Common, compatible solvents from the maintenance shops may be bulked into the same container or drum.
- c. Other hazardous wastes should be collected, each in a separate container, using the smallest container to match the amount of the chemical waste generated.
- d. All containers must be tightly capped or covered at all times and clearly labeled. If a funnel is used, the bung must be immediately replaced following use of the funnel.
- e. Secondary containment must be provided for hazardous waste containers in accumulation areas.

5. Labels:

As indicated in PLU's *Hazard Communication Program*, any vessel containing a hazardous material must be properly labeled at all times. This requirement is especially important in dealing with hazardous wastes, because if the material is unidentified, disposal may be very expensive, difficult, or even impossible. Hazardous waste labels must contain additional information as well.

Labels on all containers of hazardous chemicals must include at least:

- a. Term "Hazardous Waste" or "Dangerous Waste"
- b. Chemical name of the hazardous material. The chemical name must be in English and must not be abbreviated. Names such as "Sample 1, Run 2" or names referring to page numbers in laboratory books are not acceptable. Rather than using chemical formulas to identify wastes, the generator must name the compound in English, even if the name refers to the starting material in a reaction (e.g., "diethylmalonate derivative" or "aniline/diethylamine reaction mixture").
- c. Chemical risk or hazard of the material (e.g., corrosive acid, ignitable, toxic) must be marked on the label.

d. Accumulation start date. This is the date that the container or drum was placed in the Accumulation area.

Standard hazard labels are available from safety supply companies. The Chemistry Laboratory Supervisor, the Environmental Services Coordinator, and Environmental Health & Safety will maintain a stock of labels for use by all areas. See Appendix B for examples of labels that are available on request and Appendix C for labels that you can print out.

6. Scheduling

Environmental Health & Safety will arrange for the disposal of all hazardous wastes by a commercial waste disposal or recycling company. Disposal dates will be scheduled in consultation with the Chemistry Laboratory Supervisor and Office of Sustainability and other waste generators at PLU and in keeping with regulatory time requirements.

Inspection of Accumulation Areas

The Chemistry Laboratory Supervisor and the Environmental Services Coordinator will conduct a weekly inspection of the hazardous waste Accumulation area(s) in Reike Science Center and Facilities Management, respectively. Please use the Weekly Inspection Checklist in Appendix E or equivalent.

Manifests

The EHS Manager, Chemistry Laboratory Supervisor, Biology Lab Manager, or Facilities Management Mechanic may sign manifests. The manifests and supporting documents will be filed in the EHS Office. EHS will report to Ecology when manifests are not returned within 45 days from shipment.

Emergency Response and Preparedness

PLU is required to prepare for emergencies associated with handling of hazardous wastes. The Chemistry Laboratory Supervisor (Reike) and the Environmental Services Coordinator (Facilities) will be responsible for ensuring that the following information is posted and equipment is present and working at the Accumulation areas. Post near accumulation area:

- a. Location of Emergency Coordinator and phone number. The Environmental Health & Safety Manager will be the Emergency Coordinator for the university.
- b. Location of Fire Extinguisher
- c. Location of Spill Control
- d. Location of Fire Alarm
- e. EHS cell phone number: (360) 402-1991
- f. Campus Safety @ x7911

Test and maintain safety equipment:

- a. Communication equipment
- b. Alarm System
- c. Maintain 30" aisle space

Special Waste Categories:

Photographic Chemicals

Photographic fixer solutions cannot be disposed into the sewer. All photo fixer from PLU photography labs must be collected in plastic carboys or drums. Call Environmental Health & Safety (x7233) for pick-up and disposal. All other photographic chemicals may be sewer disposed. The word "Toxic" must be marked or labeled on the drum.

Paints

Latex paints may be disposed into the regular trash, if they are dry and solidified and the lid to the can is removed. Materials such as sawdust, vermiculite, or Portland cement may be stirred into latex paint to encourage the drying and solidifying process. The material may also be bulked for disposal.

All oil-based paints are considered hazardous materials and must be disposed through the hazardous waste disposal process. However, oil-based paints may be poured into an accumulation drum for bulk disposal.

Batteries (not including lead acid), Mercury-containing Thermostats, and Spent Lamps:

These items designate as dangerous wastes, but can be managed as "Universal Wastes", which reduces the regulatory burden for handling. Use data sheets from manufacturers to determine which lamps designate as dangerous waste. Some lamps are "green" and do not designate and do not require special handling. See Department of Ecology publication 00-04-020 and 98-407.

PLU is a small quantity handler of universal wastes because we accumulate less than 11,000 pounds of all universal waste types or less than 2200 pounds of spent lamps at any time.

The following must be followed when handling these wastes:

- Unless actively adding or removing contents containers must be closed at all times.
- Labels must state "Universal Waste" and the content, such as "Batteries" or "Lamps".
- Container, regardless of storage or accumulation location, must be labeled with the date the first item went into the container.
- Accumulation, regardless of location, is limited to one year.

Electronic Wastes

This applies to televisions and computer monitors that contain cathode ray tubes (CRT). CRTs designate as dangerous waste, but can be managed under a conditional exclusion according to publication 02-04-017. Other electronic wastes that designate as dangerous waste can also be managed under this program.

These wastes do not require manifesting or reporting to the Department of Ecology provided the hazardous components of the electronic waste are legitimately recycled. Recycling includes remanufacturing the components into new products, smelting, or salvaging usable parts.

The following must be followed when handling these wastes:

- a. Accumulation is allowed up to 180 days. PLU requires a start date on the accumulation container to verify that we are not holding these materials longer than 180 days.
- b. Use a recycling vendor that has notified Ecology of its activity in writing. Request a copy of the vendor's letter to Ecology for verification.

Biohazards

Biohazardous materials will be handled according to PLU's *Bloodborne Pathogen and & Infectious Waste Management Program*. Biohazardous materials, including syringes and sharps containers that are generated in Natural Sciences will be autoclaved by the Biology Department staff before disposal. Biohazardous materials generated elsewhere on campus will be collected for shipment at East Campus. A vendor will handle these materials. All biohazardous materials must be packaged in orange or red plastic bags and conspicuously marked with the biohazard PLU Hazardous Waste Management – April 2013

sign. Call the Office of Sustainability (x7380) for pick-up of all Biohazard containers for disposal.

Animal Carcasses

Animal carcasses, either fresh or preserved, cannot be disposed into the regular trash. Call Environmental Health & Safety (x7233) for pick-up and disposal of all animal remains.

Radioactive Wastes

Radioactive wastes are not included in this program. For more information on the proper handling and disposal of radioactive materials, see the PLU *Radioactive Materials Procedure Manual* or speak with the Radiation Safety Officer in RSC.

PCB Light Ballasts and other PCB Items

PCBs are regulated under the Toxic Substances Control Act or TSCA. PCB items that contain less than 50 ppm and greater than 2 ppm are regulated by Washington State under the dangerous waste regulations. Equipment that is labeled "non-PCB" indicates that it contains less than 50 ppm PCB.

Ballasts manufactured before July 1, 1979 should be assumed to contain.PCBs, unless credible documentation is available to state otherwise. This might include manufacturer's specifications or MSDS. Fluorescent light ballasts that contain less than 2 ppm of PCB were required to be labeled "No PCB" by the manufacturer if manufactured after July 1, 1979 and before July 1, 1998. After July 1, 1998, no marking was required.

PCB light ballasts must be marked with the out of service date or the disposal container may be marked with the out-of-service date of the first ballast that goes in the container.

PCB items must be shipped within one year of the out-of-service date.

For disposal of other wastes not listed, call Environmental Health & Safety (x7233).

Separation from the University

Employees who are leaving the university must completely clean out their laboratory, studio or shop of hazardous materials, and this activity must be signed off by the Chemical Hygiene Officer or the Environmental Health & Safety Officer on the Human Resources Out-processing form.

Distribution

This Hazardous Waste Management Plan will be included in PLU's Occupational Health, Safety and Accident Prevention Manual.

Resources:

National Research Council. *Prudent Practices in the Laboratory;* National Academy Press: Washington, DC., 1995

Task Force on Laboratory Waste Management. *Laboratory Waste Management: A Guidebook;* American Chemical Society: Washington, DC, 1994.

Appendix A. Example of a Treatment Log

	прених	A. Example of a freatment Log		
DATE OF TREATMENT	HAZARDOUS WASTE CONSTITUENTS	TREATMENT METHODS	AMOUNT OF WASTE TREATED	
TREATMENT	CONSTITUENTS	METHODS	TREATED	COMMENTS

PLU Hazardous Waste Management

Appendix B. HAZARDOUS CHEMICAL WASTE LABEL (Use these directions to complete the Hazardous Chemical Waste label)

- A. DATE this label was prepared; DEPARTMENT generating this waste; ROOM (or other location) where this waste was generated.
- B. PRINT the NAME and campus PHONE number of the person preparing this label. This person will be the contact person if there are any questions about the waste material.
- C. Fill in the full CHEMICAL NAME. DO NOT use abbreviations or chemical formulas. List the CHEMICAL CONSTITUENTS and the approximate PERCENT concentration of each constituent, to the best of your knowledge. These should equal 100%.
- D. Estimate the TOTAL QUANTITY of chemical waste in the container. Indicate UNITS of measure; e.g., liters, gallons, quarts, grams or pounds.
- E. Indicate if the waste is AQUEOUS or not. Aqueous solutions may be subject to different options than organic wastes.
- F. HAZARD CLASS: Hazardous chemicals MUST be characterized by one of these hazard classes.
- G. ATTACH the label securely to the waste container. Take the container to the waste accumulation area in the South Chemistry Stockroom (Rm. 237) of Reike Science Center, or call Environmental Services (X7385) to pick it up and take it to the hazardous waste locker in Plant Services for disposal.

A>	HAZARDO	ific Lutheran Unive DUS CHEMICA	LWASTE
A>	DEPT	ROOM	
B>	LABELED BY		PHONE
	WA	STE COMPONEN	ITS
C>			%
			%
			%
			%
			%
			%
D>	TOTAL QUANTITY_		UNITS
E>	HAZARD CLASS (Check one)	AQUE	OUS? YES NO
F>	□ IGNITABLE □ OXIDIZER □ CORROSIVE □ REACTIVE		

Appendix C.

Public Domain

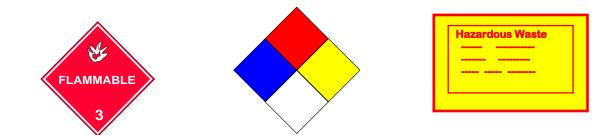
Hazardous Waste Labels

Version 2.2

A Free Ware Label System In a Word Processing Document

Compliments of:

My Own Business PO Box 189 Auburn, WA 98002-0189



Using the Hazardous Waste Labels Version 2.2

This document has been designed to aid hazardous waste generators in meeting labeling requirements for waste accumulated at their site within the State of Washington. This version should work with Microsoft Word 97, or with other Word 97 compatible word processing software. This document is free ware and is available for distribution by anyone. Please pass it along.

THE LABELS

The Table of Contents contains a "hyperlink" to its corresponding label. Just click on the hyperlink to go to the label. Choose the page (label) you want to print and send that to the printer. If you want to return to the Table of Contents, simply click the back button (<) on the web toolbar.

Affixing a label to a container:

We recommend laminating the labels, and then tape the label to the container. Magnetic tape affixed to a laminated label works very well. **HINT**: For labels to be effective, they have to be visible and clearly legible. If a label cannot be seen turn the container so it can. If it is not legible, put a new one on that is.

You do not have to have a color printer to use these labels <u>for hazardous waste</u> <u>purposes</u>. You may simply print them in gray scale and use them. The NFPA Label must be printed in color and the DOT labels must be in color if used for shipping instead of accumulation.

Trouble Shooting: Word sets the pagination based on the printer you are using. This may cause the drawings to either move up or down on the pages and appear distorted. Simply put the cursor on the page title and either press enter to move it down to the top of the next page where it belongs or backspace until it gets to the top of the page

This document is not intended to be an authoritative document on proper labeling. The instructions and definitions are general and not meant to be an official guide. This document is only provided to help generators label hazardous or other wastes they may have in their business. For official interpretations contact your local regulator concerning proper labeling. This document is not for sale and cannot be used for commercial purposes.

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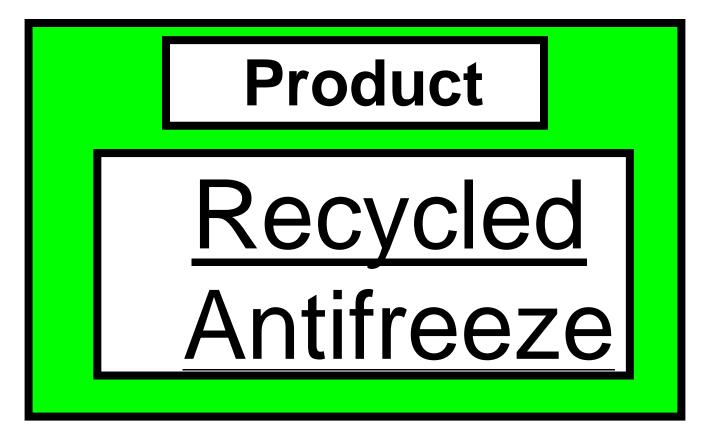
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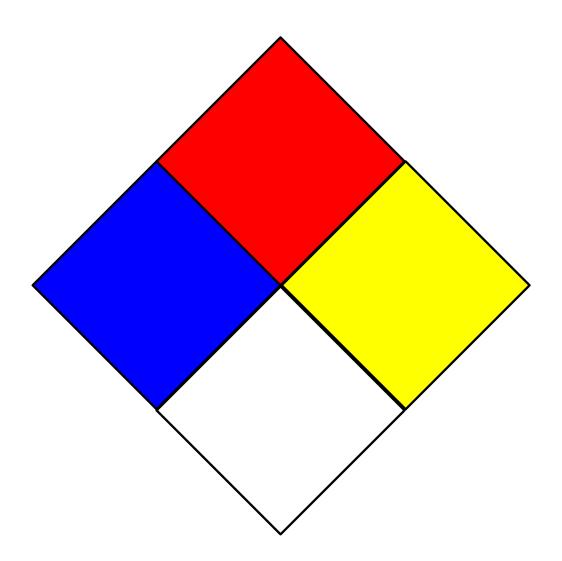
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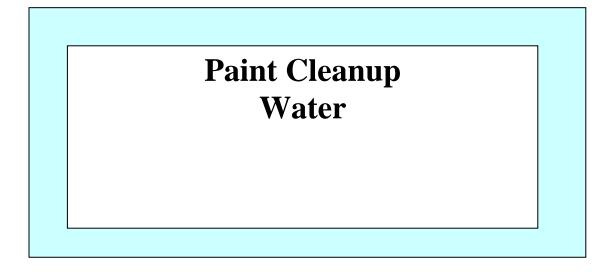


Combustible

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WA Persistent





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Waste Paint (Water-Based)





Waste Oil Based Paint

Combustible



Waste Paint Chips

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INK SLUDGE ONLY

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SILVER BEARING WASTE ONLY

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WASTE FIXER ONLY

USED OIL FILTERS





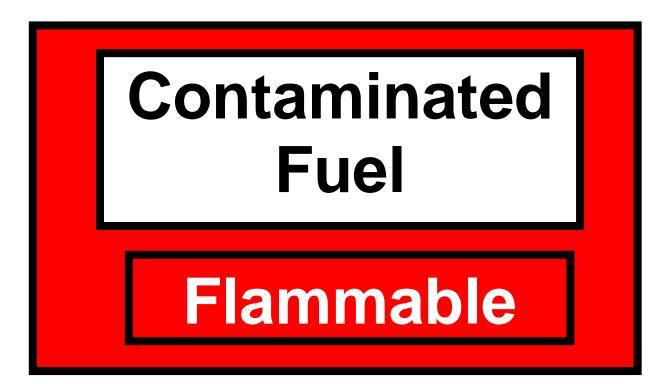
Accumulation Start Date:

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Accumulation Start Date:















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Appendix D. Pacific Lutheran University HAZARDOUS CHEMICAL WASTE INVENTORY

LOCATION		START DATE		END DATE		
ID #	HAZARDOUS MATERIAL	CHEMICAL CONSTITUENTS	QUANTITY or CONTAINER SIZE	PLASTIC/ GLASS/METAL/ CARDBOARD	LIQUID OR SOLID	HAZARD CLASS
				PGMC		
				РСМС		
				PGMC		
				PGMC		
				PGMC		
				РСМС		
				РСМС		
				РСМС		
				РСМС		
				РСМС		
				РСМС		
				РСМС		
				РСМС		
				РСМС		
				РСМС		
				РСМС		
				РБМС		

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WEEKLY INSPECTION CHECKLIST

for the Month

for Hazardous Waste Container Accumulation Area

of_____,___

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X

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N

mark answers Yes or No below

	Date	Time	Inspector's Initials
Week #1	/ /		
Week #2	/ /		
Week #3	/ /		
Week #4	/ /		

Are all drums and containers marked with a hazardous waste label (or "hold for analysis" label)?
Are all drums and containers marked with a risk label, if appropriate?
Are all containers marked with the accumulation start date?
Are there any drums that are near or have exceeded the 180-day timeframe?
Are all drums marked with the proper waste code(s)?
Are all containers closed?
Are all drum labels visible and readable?
Are all drums and containers in good condition?
Is there 30 inches of aisle space between rows of containers?

<u>Cont</u>ainment

Is the secondary containment free of cracks or other failures? Are sumps clean and free of contamination, spills, leaks, and standing water?

<u>Safe</u>ty Equipment

	5	
		Are fire extinguishers charged?
		Are spill kits stocked?
		Is the first aid cabinet stocked?
		Is the emergency shower and eye wash station functioning properly?
		Are the emergency communication devices operating properly?
		Is emergency response information posted near all communication devices?

Comments: Describe the actions taken to correct each deficiency noted above, and note date each action was taken.

Inspector's Printed Name_____

Signature