Northern Illinois University

CHEMICAL WASTE MANAGEMENT PROCEDURES

January 2021 Version

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Purpose

The Chemical Waste Management Procedures (CWMP) have been developed to provide Northern Illinois University (NIU) faculty, staff, and students with guidance in the safe and proper storage, handling, and disposal of hazardous materials.

Scope

The scope of this document is to ensure applicable regulations, industry guidelines and/or best management practices are implemented at NIU facilities. The Environmental Health and Safety Department (EHS) is the service unit of the University which is responsible for transportation, storage, and disposal of hazardous waste. Policies and procedures for handling hazardous chemicals in research and academia are developed in conjunction with the Office of Research Compliance, Integrity and Safety (ORCIS).

Application

The CWMP applies to all NIU faculty, staff, and students that use, handle, store and dispose of hazardous chemicals.

Regulatory Reference and University Policy

Resource Conservation and Recovery Act (RCRA), Code of Federal Regulations (CFR) Title 40, Chapter I, Subchapter I, Parts 260-272.
RCRA, Illinois Administrative Code (IAC) Title 35, Subtitle G, Parts 720-729.
Standards for Universal Waste Management, CFR Title 40, Chapter I, Subchapter I, Part 273.
Standards for Universal Waste Management, IAC Title 35, Subtitle G, Part 733.
Illinois Special Waste, IAC Title 35, Subtitle G, Parts 808-809.
Potentially Infectious Medical Waste, IAC Title 35, Subtitle M.
Consumer Electronics Recycling Act, Illinois Compiled Statutes, Chapter 415, Part 151.
NIU Laboratory Management Plan
NIU Health and Safety Policy.

Part 1: Overview of Chemical Waste Laws and Regulations

The CWMP establishes policies and procedures for the handling, storage, and disposal of hazardous chemical waste at NIU. The University is committed to maintaining compliance with all applicable laws concerning hazardous waste.

There are many different laws and regulations which govern the management of chemical waste at NIU. Various laws have been passed at the federal, state, and local governmental levels. It should be remembered that *any* applicable laws and regulations can be the basis for a regulatory citation. The purchase and use of any hazardous chemical carries with it the responsibility to be aware of the regulations governing its use and disposal.

1.1 Laws

1.1.1 Resource Conservation and Recovery Act

The Resource Conservation and Recovery Act (RCRA), also known as the "Solid Waste" Disposal Act, was passed in 1976. This law empowered the United States Environmental Protection Agency (EPA) to establish regulations that govern the disposal of solid and hazardous waste in the United States. In Illinois, the enforcing agency is the Illinois Environmental Protection Agency (IEPA). RCRA regulations that apply in Illinois can be found in the Illinois Administrative Code (IAC), Title 35, Subtitle G, Parts 720-729.

A solid waste is defined by RCRA in 35 IAC 721.101 as any discarded waste. This broad definition of solid waste includes any solid, liquid or gas which is disposed of, abandoned, or discarded.

The main purpose of RCRA was to address the problem of how to safely dispose of the large volumes of waste, including hazardous waste, generated by our society. RCRA was established to accomplish three goals:

1. To protect human health and the environment.
2. To reduce waste and conserve energy and natural resources.
3. To reduce the generation of hazardous waste as expeditiously as possible.

1.1.2 Comprehensive Environmental Responsibility, Compensation and Liability Act

The Comprehensive Environmental Responsibility, Compensation and Liability Act (CERCLA), commonly referred to as Superfund, was enacted in 1980. This was established to cleanup sites of hazardous waste contamination. The most important effect of this law is the establishment of a liability system which ***makes the original generator of a waste responsible for that material forever***.

Of the various regulations that the generator must follow, the generator must also share in the responsibilities for the safe management and ultimate disposal of all wastes. If the transporter or disposal facility fails to take proper care of waste or does not prevent the wastes from being released into the environment, the generator can and will be held responsible.

1.1.3 Hazardous and Solid Waste Amendments

In 1984, Congress passed the Hazardous and Solid Waste Amendments (HSWA) which reauthorized RCRA. The main feature of this law is the land ban which mandated that all hazardous waste must be treated and made nonhazardous before disposal in landfill. NIU is classified as a “small quantity generator” under RCRA: the University generates more than 220 lbs. but less than 2,200 lbs. of non-acute hazardous waste per calendar month; less than or equal to 2.2 lbs. of acute hazardous waste per calendar month; and, less than or equal to 220 lbs. of any residue or contaminated soil, water, or other debris resulting from the cleanup

of a spill, into or on any land or water, of any acute hazardous waste. The hazardous waste generator status of a facility is an EPA designation that is based on the quantity of hazardous waste generated in any given month of the calendar year. Generator status is used to determine the facility's level of regulation.

1.1.4 Academic Laboratories Rule (Subpart K)

On December 1, 2008, the EPA added 40 CFR Part 262 Subpart K: Alternative Requirements for Hazardous Waste Determination and Accumulation of Unwanted Material for Laboratories Owned by Eligible Academic Entities (Subpart K) to the RCRA hazardous waste generator regulations. The rule establishes an optional, alternative set of rules that provides eligible academic laboratories with the option of complying with a less onerous set of requirements. NIU has adopted Subpart K regulations to comply with recent RCRA changes related to the management of hazardous waste.

1.2 Regulations

The actual legal requirements associated with a particular law and the way it is enforced are determined by the regulations written for it. Regulations dealing with the disposal of waste in Illinois are a combination of local, state, and federal requirements. All chemical waste, whether toxic, hazardous, or non-hazardous, is potentially regulated as *Illinois Special Waste* if placed in the trash and, therefore, should not be disposed of in this manner until a waste determination and non-special waste certification is made. The regulations which govern Illinois Special Waste can be found in the IAC, Title 35, Subtitle G, Parts 808-809. It is a felony to knowingly and willfully dispose of material which meets these criteria in the normal trash or sewer.

In accordance with federal regulations, the State of Illinois maintains a waste manifest system which tracks all hazardous waste generated in the state from the generator's site until it reaches its final disposal site. The manifest is uniform across the country, so it is possible to track waste anywhere in the United States.

Other RCRA regulations require that small quantity generators (SQGs) of hazardous waste, such as NIU, maintain contingency plans for hazardous waste spills and inspect waste accumulation areas. Employees whose work generates hazardous waste must be trained in proper disposal procedures. A special area of emphasis of these regulations is the development of a waste minimization program which is to reduce the amount of waste the generator produces. In addition, the 2016 Hazardous Waste Generator Improvements Rule requires SQGs to re-notify the IEPA of their hazardous waste activities every four years.

All the laws and regulations described above make compliance the responsibility of the generator. Ignorance of these laws or regulations is no defense against citations or fines. At NIU, the user of a hazardous chemical is ultimately responsible for compliance with regulations applicable to a particular chemical. The Environmental Health and Safety Department (EHS) and the Office of Research Compliance, Integrity, and Safety (ORCIS) assist the NIU community in compliance with these requirements.

1.3 Enforcement

The IEPA is authorized to seek civil and criminal penalties for RCRA violations. Educational institutions have not been excluded. Several universities have been found guilty of RCRA violations and have had to pay substantial penalties. Under revisions applicable in October 1990, the individuals guilty of RCRA violations can be personally brought to court and face mandatory penalties as well as imprisonment. ***One substantial penalty for violation of IEPA regulations is that faculty, staff, and researchers may not receive federal funds***. Due to these developments, universities must ensure that staff, faculty, and students understand waste management practices.

1.4 Reporting Inappropriate Disposal of Potentially Hazardous Chemicals

The inappropriate disposal of potentially hazardous chemicals is illegal and can have serious repercussions. Northern Illinois University is firmly committed to the safe and proper disposal of all its hazardous wastes. Moreover, the University is committed to promoting waste minimization and pollution prevention in all aspects of its activities.

Under no circumstances should hazardous wastes be discharged into the environment in an effort to "save money," as a matter of "convenience," or due to carelessness in planning, preparation, operations or design. Assistance in preventing or resolving such issues is always available from EHS or ORCIS.

If you suspect or have knowledge of the inappropriate disposal of potentially hazardous materials or deviations from the CWMP, you should immediately report these concerns to EHS or ORCIS.

No employee of NIU shall be discriminated against or be subject to any reprisal for reporting suspected violations of the University's policies on the disposal of potentially hazardous materials.

Part 2: Waste Minimization

Waste minimization techniques focus on preventing waster from ever being created, otherwise known as source reduction and recycling. The EPA's policy for hazardous waste management places the highest priority on waste minimization.

Waste minimization is any action that:

- Decreases the amount of hazardous waste generated.
- Reduces the inherent toxicity of the waste.

The costs associated with the proper disposal of chemical wastes and the safe storage of chemicals in the research laboratory are inextricably linked. Researchers are encouraged to limit the amount of chemicals purchased to what is needed. It is better to order additional chemicals than to dispose of unwanted or unused surplus chemicals. ***REMEMBER: The disposal cost can exceed ten times the cost of the chemical.***

In some cases, there are no acceptable waste disposal options. Review how you purchase, handle, and store laboratory chemicals to control the increasing costs of proper chemical waste disposal and the inherent hazards of storing and working with hazardous chemicals.

Waste minimization benefits you, the University, and the environment by:

- Significantly lowering costs.
- Reducing potential health hazards.
- Reducing potential long-term liabilities for disposal.
- Promoting environmental ethics.
- Preventing pollution.

It is the responsibility of every individual who generates waste to incorporate the principles of waste minimization into experimental design. An important benefit from waste minimization is that it will help reduce the University's escalating chemical disposal costs.

2.1 Waste Minimization Techniques

2.1.1 Management

It is important to audit chemical supplies and use inventory control. Purchase only the quantity of chemical required and use all of what is purchased.

2.1.2 Process Modification

To the extent that it does not compromise vital research, teaching or service, research faculty and staff are encouraged to explore alternate experimental or standard processes to decrease the quantity of hazardous chemicals used and generated. Where possible, micro and semi-

micro techniques should be investigated as possible alternatives in order to reduce the amount of waste generated.

2.1.3 Product Substitution

Substitute non-hazardous or less toxic materials in your chemical processes and experiments. Some examples of this are:

- Using water-based inks instead of solvent-based inks in printing operations;
- Substituting detergents and enzymatic cleaners for sulfuric acid/potassium dichromate (chromerge) cleaning solutions and ethanol/potassium hydroxide cleaning solutions;
- Avoiding the use of known carcinogens, mutagens, or extremely hazardous chemicals where possible;
- Using SYBR Safe DNA gel stain, instead of ethidium bromide; and,
- Using alcohol or glycol thermometers instead of mercury thermometers

2.1.4 Purchasing

Purchase only the quantity of chemical required for specific projects. Find the minimum unit required for an experiment and order accordingly. Do not stockpile chemicals unnecessarily. A significant percentage of waste disposed by the University consists of old, unused reagent chemicals.

2.1.5 Recycling/Redistribution

Chemicals that are like new or unopened can often be redistributed to other labs or work areas saving disposal costs for the University and new product costs for the recipient. Contact ORCIS if you have chemicals which can be recycled.

2.1.6 Segregation and Characterization

Do not mix hazardous wastes with nonhazardous waste. If any volume of listed hazardous waste is mixed with a nonhazardous waste, the resulting mixture is considered hazardous.

Do not mix different classes of hazardous waste together unless required as part of the experiment (i.e. putting mercuric chloride waste in with the acetone waste bottle). Refer to section V of this document entitled “Specific Handling Requirements for Chemicals”.

It should be noted that dilution of a characteristically hazardous waste to make it nonhazardous is not an acceptable method of treatment.

Accurately label waste bottles as to their exact content and approximate percentages. Segregation and characterization simplify the waste streams, thus minimizing the cost of disposal.

Part 3: Hazardous Waste Definition

Hazardous materials are substances that have hazardous characteristics such as: flammable, corrosive, reactive, toxic, radioactive, poisonous, carcinogenic or infectious. Wastes that contain these materials are considered hazardous because they present a potential risk to humans and/or the environment. The CWMP separates waste into three broad groups: **radioactive, biohazardous and chemical.**

3.1 Radioactive Waste

Radioactive waste is classified as either low-level or high-level waste. Low-level waste is typical of that found at medical and research institutions while high-level waste is typical of that generated at nuclear reactors. At NIU, a radioactive waste is any waste with detectable radioactivity that is generated from procedures involving licensed radioactive material.

The definitions and disposal procedures for radioactive waste can be found in the NIU Radiation Safety Manual or by contacting the NIU Radiation Safety Officer.

3.2 Biohazardous Waste

Potentially Infectious Medical Waste (PIMW) is waste generated in connection with the diagnosis, treatment or immunization of human beings or animals; research pertaining to the provision of medical services; or the provision or testing of biologicals.

PIMW is referred to by many different terms including medical, infectious, red-bag, hospital, biohazardous, and regulated waste. Biohazardous agent refers to an agent that is biological in nature, capable of self-replication, and has the capacity to produce deleterious effects upon biological organisms. Biological waste is any material that contains or has been contaminated by a biohazardous agent.

3.2.1 Waste Disposal

NIU has a contract with a licensed PIMW disposal company that will transport, treat and dispose of all biological waste generated on campus. Biological waste must be placed into appropriately labeled, leak-proof containers. Waste must be placed in a red biohazard bag that is contained within a cardboard box supplied by the vendor for disposal.

3.2.1 Sharps Disposal

Sharps are items that are capable of puncturing, cutting, or abrading the skin. Sharps include, but are not limited to, glass and plastic pipettes, broken glass, test tubes, razor blades, syringes, and needles. All sharps must be placed into a properly labeled sharps container or other rigid, puncture-proof container. Once a sharps container is two-thirds full, the lid must be secured, and the sharps container placed in a red biohazard bag within the cardboard box supplied by the disposal vendor.

The cardboard box should be taped shut once it is full. Do not overfill the box. The box flaps should easily fold down onto the top of the box and the total weight of the box must not exceed 45 pounds. Contact EHS to schedule a waste pickup and to request additional supplies.

3.3 Chemical Waste

Chemical waste includes a wide range of material such as discarded commercial chemical products (DCCP), process wastes and wastewater. Some chemicals and chemical mixtures are hazardous wastes because they are specifically listed by the EPA. A chemical waste that is not listed by the EPA is still a hazardous waste if it has one or more of EPA's four hazardous characteristics: **ignitability**, **corrosivity**, **reactivity** or **toxicity**.

Workers who generate hazardous waste(s) of any kind must be aware that there may be mixed hazards in their waste; that is, a combination of any of the three types of hazardous waste. For example, animal carcasses containing radioactive material, a hazardous chemical and perhaps an infectious agent would need to be managed according to the considerations and requirements of all three types of hazards defined above. If you will be generating mixed waste, contact EHS or ORCIS to determine the proper way to handle and manage this material before the waste is generated. Any chemical that exhibits hazardous characteristics as defined by federal and Illinois rules and regulations, is unusable or unwanted in any way, and poses a potential hazard to individuals, the environment or public health is a hazardous chemical waste.

Examples:

- Waste and opened surplus chemicals.
- Expired or off-specification chemicals.
- Carcinogens and cytotoxic (antineoplastic) agents.
- Prescription drugs and controlled substances.
- Empty chemical drums and other chemical containers with a capacity of 10 gallons and greater.
- Thermometers and other items containing mercury.
- Non-returnable gas cylinders and lecture bottles or pressurized chemicals.
- Residue of spill clean-up materials-contaminated rags and absorbents.
- Non-radioactive lead shielding, lead blocks and lead scrap.
- Photographic film processing solutions.
- Used oil (motor, vacuum pump, lubricating).
- Pesticides.
- Used solvents.
- Paint, paint thinners, brush cleaners, linseed oil, thinner contaminated rags.
- Heavy metal containing waste or products (arsenic, barium, cadmium, chromium, lead, mercury, selenium and silver).

A chemical waste is considered a hazardous waste if it meets any of the four hazardous waste characteristics or if it is specifically listed by the EPA as a hazardous waste.

3.3.1 Characteristic Hazardous Waste

In addition to listed waste, any discarded material is considered to be a hazardous waste if it, or any component of the material, meets one or more of the four characteristics below.

3.3.1.1 Ignitable Waste (D001)

- A liquid that has a flash point of less than 140°F.
- A material that is not a liquid and is capable of causing fire through friction, absorption of moisture or spontaneous chemical change that can result in vigorous and persistent burning.
- An ignitable compressed gas.
- A material defined as an oxidizer by the Department of Transportation (DOT).

3.3.1.2 Corrosive Waste (D002)

- An aqueous solution which has a pH less than or equal to 2 or greater than or equal to 12.5.
- Is a liquid and corrodes steel at a rate greater than 6.35 mm per year at a test temperature of 55°C.

3.3.1.3 Reactive Waste (D003)

- A material that is normally unstable and readily undergoes violent chemical change without detonating.
- A material that when mixed with water reacts violently to form potentially explosive mixtures or can generate toxic gases, vapors or fumes in a quantity sufficient to present a danger to human health or the environment.
- Is a cyanide or sulfide bearing waste that can generate toxic gases, vapors or fumes.
- A material that is capable of detonation or explosive reaction if it is subjected to a strong initiating source or if heated under confinement.
- Is readily capable of detonation or explosive decomposition or reaction at standard temperature and pressure.

3.3.1.4 Toxic Waste (D004-D043)

Any waste which contains concentrations of certain constituents in excess of regulatory limits is a toxic hazardous waste. The 40 constituents that must be considered when evaluating a waste for potential toxic concentrations can be found in the regulations at 40 CFR 261.24.

3.3.2 Listed Hazardous Waste

There are four different groups of listed hazardous waste which in total includes over 800 different substances:

3.3.3 The P-List and the U-List

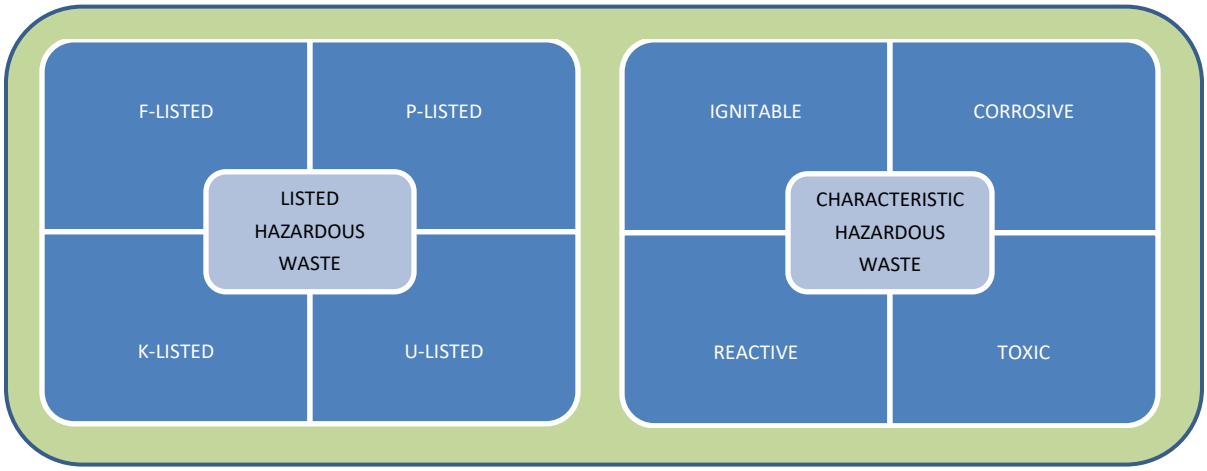
P-Listed waste is particularly noteworthy in that it is defined as acutely toxic and, therefore, subject to more stringent accumulation requirements than other hazardous wastes. The P-list and the U-list include specific commercial chemical products in an unused form. In order to meet the criteria for a "P" or "U" listing, the waste material must not have been used for its intended purpose and consists of materials that have simply exceeded their expiration dates for usefulness. The individual chemicals and their corresponding Chemical Abstract Numbers (CAS) that comprise the "P" and "U" lists may be found in Title 40 of the Code of Federal Regulations Part 261.33 (40 CFR 261.33).

3.3.4 The F-List

This list identifies wastes from common manufacturing and industrial processes, such as solvents that have been used in cleaning or degreasing operations. Because the processes producing these wastes can occur in different sectors of industry, the F-listed wastes are known as wastes from non-specific sources. Wastes included on the F-list can be found in the regulations at 40 CFR 261.31.

3.3.5 The K-List

This list includes certain wastes from specific industries, such as petroleum refining or pesticide manufacturing. Certain sludges and wastewaters from treatment and production processes in these industries are examples of source-specific wastes. The University does not generate any K-listed waste. Wastes included on the K-list can be found in the regulations at 40 CFR 261.32.



If your waste falls into either the *listed* or *characteristic* categories it must be treated as a hazardous waste. Hazardous waste ***cannot*** be disposed of by pouring down a drain, evaporation, or by throwing in the general trash. There are significant fines and penalties involved when hazardous waste is disposed of illegally. In addition to the legal ramifications please realize that toxic wastes disposed down the sink or in the trash may cause environmental harm and can also create an unacceptable risk to human health.

However, there may occasionally be a waste generated that does not meet the listing or characteristic criteria for a hazardous waste and that the generator, based on their knowledge, believes to be safe for drain or trash disposal. These situations can be evaluated on a case by case basis by the ORCIS and a written determination will be provided to the generator. ***Under no circumstances may any waste material be disposed in a drain without having received prior approval.***

Part 4: Management of Hazardous Waste

Northern Illinois University is classified as a Small Quantity Generator (SQG) by the EPA. Hazardous waste is disposed of by a third-party hauler and is transported off site approximately three times a year to a waste treatment facility where the waste may be reclaimed, recycled, chemically or physically treated, or destroyed by high temperature incineration.

On January 1, 2020, NIU began managing laboratory waste in accordance with Subpart K regulations. Subpart K is an optional, alternative set of regulations that address the specific nature of hazardous waste generation and accumulation in laboratories at colleges and universities.

The NIU Laboratory Management Plan (LMP) standardizes the management of unwanted materials generated in laboratories. The LMP was developed in accordance with the Subpart K requirements. The plan delineates the management of all regulated waste materials generated in research laboratories, teaching laboratories, art studios, photography laboratories, field laboratories, academic shops and areas that provide a support function to teaching or research laboratories (e.g., chemical stockrooms and preparatory rooms). A copy of the LMP is included as Appendix A.

The waste management process described in the LMP applies ***only to laboratories*** as defined by 40 CFR 262.200. The areas that are not covered under Subpart K will operate as a small quantity generator under 40 CFR 262 and 35 IAC 722 as outlined in Sections 4.1 through 4.7 of the CWMP. These areas include, but are not limited to maintenance areas, custodial storage rooms, machine shops, print shops, trade shops, heating plants, residential dining halls and recreational facilities.

4.1 Waste Accumulation and Storage Areas

There are only two types of hazardous waste accumulation and storage areas managed at the University. These areas and a brief description of each are listed below. All waste accumulation and storage areas are subject to routine audits and inspections by regulatory authorities who may conduct audits ***unannounced at any time*** they see fit.

4.1.1 Satellite Accumulation Areas

The regulations define any location where small amounts of chemical waste are temporarily stored prior to pick up as a "Satellite Accumulation Area" or "SAA". The hazardous waste containers in an SAA must always remain at or near the point of generation (i.e., at or near the benchtop or within the room itself) and must be under the control of the operator of the process generating the waste at all times until they are ready for pick up by EHS or ORCIS personnel.

At no time may more than 55 gallons of hazardous waste or 1 quart of acute hazardous waste (e.g., "P-Listed") accumulate in an SAA prior to pick up or movement of the waste container

to a proper storage area. Any waste in excess of the 55-gallon or 1-quart limits must be removed from the SAA within 3 consecutive calendar days. Therefore, once the threshold is reached, contact EHS or ORCIS immediately.

4.1.2 Central Accumulation Area

The only storage area on the University's main campus that falls into this classification is located in the Hazardous Materials Storage Building. Hazardous waste must not accumulate on site for more than 180 days. The quantity of hazardous waste accumulated on site must never exceed 13,200 lbs. Weekly inspections, specific storage requirements, emergency procedure availability, training, and recordkeeping requirements exist for this area.

4.2 Hazardous Waste Containers

The best containers for hazardous waste are the original ones the materials came in. If the original container cannot be used, then a comparable container with an equal or greater United Nations (UN) rating is acceptable. Containers such as 5-gallon plastic jugs and 4-liter glass bottles are acceptable if the container and any residue left inside are compatible with the new waste material (i.e., no acids in steel containers). Larger containers are better if they can be filled within a reasonable time and do not present a storage hazard at your location. For liquids, fill containers to about 90 percent of container volume to allow for liquid expansion. Do ***NOT*** fill containers to the top. Please fill the containers to within 1 or 2 inches from the cap before requesting disposal. This will aid the University in reducing waste, cutting costs and speed up removal of wastes from your location.

4.3 Proper Lids For Containers

All containers must have a secure, tight fitting, non-leaking lid. When the container is full the lid must be exchanged with a proper lid. Cracked or leaking lids sealed with parafilm are a deviation from storage requirements and must be changed immediately when found and prior to pick up by EHS. Corks placed into containers are not considered secure and must not be used. Container lids must be secure at all times unless waste is physically being added to the container.

4.4 Labeling and Dating of Waste Containers

Each hazardous waste container must be labeled with the words "Hazardous Waste" when the first drop of waste is poured into the container. Additionally, during its use the generator must keep a running label of the contents of the container. The container must also include labels that indicate the hazard of the contents (e.g, OSHA pictograms, DOT placards, NFPA labels, etc.). Small bottles of discarded chemical commercial products in their ***original container*** do not need to be labeled with the words "Hazardous Waste". When labeling waste be specific (e.g., "Xylene", "Acetone", "Toluene", etc.) instead of using generalities such as "Non-Halogenated Solvents". Do not use abbreviations, chemical formulas or trade names. Descriptions such as "Waste" or "Acetone Waste" in and of themselves are not acceptable but may be included as supplemental information. Proper labeling will eliminate

the problem of identifying unknown chemicals and wastes. No date should be placed on the label during the period the container is being used.

Hazardous waste containers within the central accumulation area must be labeled with "Hazardous Waste" and must also have the date clearly shown on the container when it was moved into the Hazardous Materials Storage Building or began accumulating waste. The chemical names of substances in the container must be listed on the container or readily available.

4.5 Inspections

Personnel working in a SAA should check the containers daily to insure they are properly closed, incompatible segregation is occurring, drains are properly protected, the containers are under control of the lab personnel, full containers are in the process of being removed and the thresholds of 55 gallons of hazardous waste or 1 quart of acute hazardous waste are not being reached. If a waste container is full, it can no longer be accumulating, since it cannot have any more material put in it. If this waste is left in the SAA for more than three consecutive calendar days, the satellite area is then deemed by the EPA as having become a Central Accumulation Facility. This area could then be cited for failure to follow requirements for a Central Accumulation Facility, including weekly inspections, physical separation of waste and other requirements.

The Hazardous Materials Storage Building is designated as the University's *Central Accumulation Area* and subject to weekly inspections. The inspections should follow the inspection checklist for the area and must include the date of inspection, the person performing the inspection and any deficiencies noted along with documentation of corrective actions taken.

4.6 Storage, Compatibility and Safety

All waste must be stored in a safe and secure area. Never leave waste in a hallway, loading dock or other unsecured area where it may be subject to public contact. The best places to accumulate wastes are under fume hoods or inside an appropriate safety cabinet. Waste stored in *Satellite Accumulation Areas* must be near the point of generation and always under the control of trained personnel.

Hazardous waste should never be stored in or around drains or sinks. If it is unavoidable for the waste container to be near a drain, then a spill tray should be used. Chemicals and waste products should enter the sewer only through actions incidental to the process of experiment, such as container washing and rinsing. Never allow flammable liquids, heavy metals or extremely toxic substances to enter the sewer.

Incompatible wastes or chemicals must be separated by storing wastes in separate containment bins. Accidental mixing of one hazardous waste with another may result in a vigorous and dangerous chemical reaction. Generation of toxic gases, heat, possible overflow or rupturing of receptacles, fire and even explosions are possible consequences of

such reactions. Check with appropriate staff, Safety Data Sheets (SDS) or other applicable literature to determine chemical compatibility.

4.7 Scheduling a Chemical Waste Pickup

Hazardous and chemical waste containers may only be moved from the SAA to designated storage areas by trained personnel. Prior to having the waste picked up, information must be provided to EHS or ORCIS to adequately characterize and dispose of the waste. The waste generator should be ready to provide this information when a request for pickup is made. Requests for pickups can be made in the following ways:

1) Contact EHS at 815-753-0404 or via email at dmannia@niu.edu;
2) Contact ORCIS at 815-753-1610 or via email at jgable@niu.edu; or,
3) Submit a *Request For Services* online at http://www.niu.edu/ehs/contact/request.shtml.

EHS and ORCIS will evaluate the information and schedule the material for pickup. Allow 3-5 business days for pickup. If the information provided is insufficient, additional information will be requested from the generator. Waste will not be picked up until the appropriate information is received. Wastes may require the generator to certify the presence or absence of constituents and concentrations. This certification can be based on the generator's knowledge, analytical testing or other scientific data.

The generator, in making the certification, accepts the associated liability and responsibility for possible misrepresentation of the waste. ***Penalties for misrepresentation, a violation of state and federal law, can include fines and/or imprisonment***.

Part 5: Specific Handling Requirements for Chemicals

5.1 Acids, Bases, and Aqueous Solutions

Collect concentrated acids and bases in original containers whenever possible. Do NOT mix strong inorganic acids (e.g., HCl and HNO_3) or oxidizers with organic compounds. Keep acids, bases or aqueous solutions containing heavy metals separate from other waste. Avoid mixing concentrated acids and bases together in the same container.

5.2 Aerosol Cans

Many products come in aerosol cans, including cleaners, coolants, paints, lubricants and starting fluid. Aerosol cans frequently contain hazardous materials that are flammable or toxic. Aerosol cans should be disposed through EHS by requesting a chemical waste pickup.

5.3 Asbestos

The definitions and disposal procedures for asbestos waste can be found in the NIU Asbestos Management Plan (https://www.niu.edu/facilities/pdf/ehs/acm-mgmt-plan.pdf) or by contacting EHS.

5.4 Bulk Chemicals (20, 30 or 55 Gallon Drums)

Drums should be in good condition, have workable bungs and approved by the Department of Transportation (DOT). Original shipping containers are DOT approved for disposal of the used or discarded original material. Do NOT store metal drums outside where they will rust. Do NOT pack smaller containers of chemical into a large drum for disposal.

5.5 Compressed Gas Cylinders

Cylinders are pressure vessels intended to hold compressed gases. The sudden release of compressed gas could cause the cylinder to expel shrapnel or become a projectile, resulting in extensive property damage, serious injury or even death. Any cylinder still containing material should be considered hazardous and disposed of in accordance with federal, state, and local regulations.

All departments are required to return discarded gas cylinders to the vendor to regain the deposit on the cylinder and minimize rental charges. For non-refillable cylinders or cylinders that cannot be returned to the manufacturer, contact the EHS department for proper disposal.

5.6 Controlled Substances

Substances controlled by the Drug Enforcement Agency (DEA) cannot be disposed by our chemical waste hauler. Controlled substances must be transferred using the DEA form 222. Contact ORCIS for disposal procedures.

5.7 Empty Containers

An "empty container" is defined by the Federal regulations as a container in which all materials have been removed using practices commonly employed to remove material from that type of container, e.g. pouring, pumping or aspirating. In order to be considered empty, containers that held liquids must not have one drop of material left that can be removed by inverting the container. Containers that held solid and semi-solid materials are considered empty when no more material can be feasibly removed by scraping or chipping.

Disposal of empty hazardous material containers is strictly regulated. Containers that held extremely hazardous or acutely toxic hazardous materials (EPA "P-Listed" chemicals, or if the oral LD50 is less than 50 mg/kg) must be managed as hazardous waste. Containers that held an acute hazardous waste or a product that would become an acute hazardous waste when disposed of are not "empty" for hazardous waste purposes unless they have been triple-rinsed with a solvent that will dissolve the acute hazardous waste or product. The solvent must then be managed as an acute hazardous waste. ***Do not rinse out containers that held acutely toxic hazardous materials***. This will create more waste and increase disposal costs. Contact EHS or ORCIS for the disposal of all extremely hazardous or acutely toxic hazardous materials and containers.

If a container meets the definition of an empty container (RCRA empty) as defined by 40 CFR 261.7, then it is not subject to regulation under RCRA as a hazardous waste. All containers that have been certified empty must have the manufacturer's label or any other markings identifying the previous contents completely removed or defaced and the word "empty" written on the container. Covering or defacing original labels and labeling as "empty" will help personnel know the container is empty and has been properly managed. Do not obliterate the original product label. EHS or ORCIS personnel may need to see what was in the container.

All lids and bottle caps should be removed prior to disposal in order to prevent pressurization during compaction. If the capacity of the container is less than or equal to 5 gallons, it should be taken directly to the trash dumpster for disposal by the personnel generating the container. If the capacity of the container is greater than 5 gallons, contact EHS or ORCIS personnel for proper disposal.

5.8 Ethidium Bromide

Ethidium bromide and its byproducts are strong mutagens, possible carcinogens, and possible teratogens at higher concentrations. Although this waste is not regulated as hazardous waste, the mutagenic properties of these waste may present a hazard if disposed down the drain or in the regular trash. Solutions containing ethidium bromide should be collected for disposal. Test tubes, gloves, papers, and other items may or may not require special attention. If these items are clearly contaminated with ethidium bromide, they should be disposed of as hazardous waste. Solids must be separated from liquids. Contact ORCIS to dispose of liquid and solid wastes containing ethidium bromide.

5.9 Formalin and Formaldehyde Solutions

Formalin is the commercial name given to a formaldehyde solution. Formaldehyde is a suspected carcinogen with a low permissible exposure limit (PEL) and poor warning properties. Formaldehyde solutions should be disposed of as chemical hazardous waste.

5.10 Mercury and Mercury Compounds

Hazardous waste regulations require that wastes containing mercury be sent to a facility where mercury can be recovered in a retort or roasting thermal process unit. The use of mercury is strongly discouraged.

Mercury is defined as a hazardous material by the EPA. Therefore, all mercury "spills" need to be cleaned up following safe and environmentally sound procedures by specially trained personnel. Mercury and all materials contaminated with mercury must be turned over to EHS. No mercury, including broken thermometers, may be disposed of in the normal trash or the sewer system.

5.11 Oils, Lubricating Fluids and Cooling Fluids

This category of material is collected for recycling and includes: motor oil, transmission fluid, lubricating oil, cutting oil, hydraulic oil, and vacuum pump oil. Collect waste oils in 1-gallon, 5-gallon or 55-gallon containers depending on the volume of material generated. This waste stream is nonhazardous if it is recycled and therefore exempt from the 180 day storage limit. ***Do NOT mix flammable solvents, halogenated solvents (degreasers), water or antifreeze with waste oils***.

5.12 Organic Peroxides

Organic peroxides are a class of compounds with unusual stability problems and are one of the most hazardous classes of chemicals handled in the laboratory. Many common laboratory chemicals (e.g., isopropyl ether, diethyl ether, dioxane, etc.) can form peroxides on exposure to air so that a single opening of the container can allow formation of peroxides to take place. Peroxides are shock-sensitive compounds that can explode if subjected to mechanical shock, intense light, rapid changes in temperature, heat, or in some cases, by spontaneous reaction.

Many common peroxide former compounds are marked by the manufacturer with an expiration date, usually one year form the date of manufacture. Laboratories should send expired peroxide forming compounds to ORCIS for disposal as soon as possible after the expiration date. ***Never move or open a container if crusty deposits formed on the material or its container, an oily, viscous layer appeared, or there are solids on the bottom.*** Immediately contact ORCIS or EHS if rusted, damaged, outdated, or suspicious looking containers of peroxide forming materials are found.

5.13 Organic Solvents and Ignitable Liquids

Keep halogenated wastes separate from non-halogenated solvent wastes if possible. Separate organic solvents from aqueous solutions whenever possible. Keep acidified solvents separate from other solvent and acid wastes.

5.14 Paint and Paint Thinner

Separate solid paint sludge from paint thinners by pouring off thinners into a separate waste container. ***Do NOT put brushes, rollers, paper or other debris in paint wastes***. Keep water and water-based paint wastes separate from oil-based paint wastes. Rinsate from water-based paint cleanup is nonhazardous and can be disposed of down the sanitary sewer.

5.15 Photodeveloper and Photofixer

Photodeveloper is a hazardous waste if it contains constituents in concentrations greater than those listed in 40 CFR 261.24, if it is corrosive (pH < 2 or > 12.5) or if it is ignitable. Used photofixer contains silver, a heavy metal, and therefore is a hazardous waste. It may also be corrosive. Collect fixer and developer in separate 5-gallon polyethylene containers.

5.16 Pyrophoric Materials

Pyrophoric and water reactive materials can ignite spontaneously on contact with air, moisture in the air, oxygen, or water. Pyrophoric chemicals should be stored under an atmosphere of inert gas or under kerosene, oil, or within a solvent as appropriate. Do NOT allow pyrophoric chemicals stored in solvent to dry out. Waste pyrophoric chemicals should be disposed of immediately and should NOT be allowed to accumulate. All materials that contain or are contaminated with pyrophoric chemicals should be disposed of as hazardous waste.

5.17 Unknowns

Chemical wastes with no identification (unknowns) present a particularly dangerous threat, due to their unknown composition and characteristics. Unknown waste should not be transported, treated, or disposed of until chemical analysis has been completed to determine the hazardous properties.

All users of chemicals are required to properly label each container of chemicals, including chemical wastes, indicating by proper chemical name(s) the nature of its contents. Any container not so labeled will be considered to contain unknown chemicals for disposal and will require that the generator have the unknown(s) characterized at the generator's expense.

If an unlabeled container is found, it is to the advantage of the generator to make use of any knowledge which may exist as to the circumstances in which the unknown was generated. Such information can often aid in simplifying the characterization process and therefore reducing the cost to the generator.

If you have an unknown material, contact EHS or ORCIS. The unknown material will then be analyzed to either determine the chemicals involved or characterize the unknown into a category for legal disposal.

Part 6: Universal Waste and Other Waste

6.1 Universal Waste

A subset of very common hazardous waste is managed as universal waste and subject to less stringent guidelines set up to encourage recycling and reduce illegal disposal. The EPA's universal waste regulations (40 CFR 273) streamline hazardous waste management standards for federally designated "universal wastes," which include batteries, spent fluorescent lamps, pesticides, certain mercury containing equipment and aerosol cans. All universal wastes are hazardous wastes and would otherwise have to be managed under the same stringent standards as other hazardous wastes.

NIU is currently a Small Quantity Generator (SQG) of Universal Waste, meaning that NIU does not accumulate 5,000 kg or more of universal waste at any time. Universal wastes must be labeled as such with a "Universal Waste" label, the container dated when material is placed into it and may not be accumulated for more than one year. EHS is charged with assisting universal waste generators to ensure proper management of universal waste, including handling, storage and disposal in accordance with state and federal regulations.

In order to make a request for pickup contact EHS by calling 815-753-0404, or submitting a *Request For Services* online at http://www.niu.edu/ehs/contact/request.shtml.

6.1.1 Batteries

A "battery" is defined as a device consisting of one or more electrically connected electrochemical cells that is designed to receive, store, and deliver electric energy. Many spent batteries such as lithium ion (Li-Ion), nickel cadmium (Ni-Cd), nickel metal hydride (Ni-MH) and lead acid batteries are classified as universal waste.

Alkaline batteries (AAA, AA, C, D, 9V, etc.) are not hazardous and do not qualify as universal waste. However, although there is no EPA requirement to recycle alkaline batteries, the University has chosen to adopt a recycling program to keep these batteries out of the landfill.

An initiative sponsored by the NIU Green Team, Campus Mail Services and EHS allows campus departments to ship spent alkaline batteries (along with miscellaneous rechargeable batteries) to the campus mail room. Upon receipt, EHS staff segregates the batteries by chemistry type, verifies that the terminals are properly sealed and packages the batteries in drums for shipment per DOT regulations. EHS maintains recycling documentation on file.

6.1.2 Lamps

A "lamp" or "universal waste lamp" is defined as the bulb or tube portion of an electric lighting device. A lamp is specifically designed to produce radiant energy, most often in the

ultraviolet, visible or infra-red regions of the electromagnetic spectrum. Common examples of universal waste electric lamps include, but are not limited to, fluorescent, high intensity discharge, neon, mercury vapor, high pressure sodium and metal halide lamps. These lamps are known to contain trace amounts of mercury vapor and other heavy metals.

No lamps can be placed directly in the trash. Once a lamp is removed from a fixture, it must be stored in a closed container. Unprotected lamps pose a hazard to personnel and the environment. Used lamps should not be left uncontained or in an area where they could be broken. The container can be the original box or any other container that can be closed completely to protect lamps.

Used lamps are collected by EHS, Building Services and the Electrical Shop. The lamps are segregated by type, placed into suitable containers, labeled and packaged on pallets per DOT regulations. EHS maintains recycling documentation on file.

6.1.3 Mercury Containing Equipment

This category includes devices, items, or articles (excluding batteries and lamps) that contain varying amounts of elemental mercury integral to its function. Some commonly recognized devices are thermostats, barometers, temperature and pressure gauges, manometers, and mercury switches. Contact EHS or ORCIS to dispose of mercury containing equipment.

6.1.4 Aerosol Cans

In February of 2020, the EPA added aerosol cans to the federal universal waste list, allowing generators to manage aerosol products with the less complicated universal waste requirements. However, aerosol cans frequently contain hazardous materials that are flammable or toxic. Aerosol cans should be disposed through EHS by requesting a chemical waste pickup.

6.2 Other Waste

6.2.1 Electronic Waste

The Consumer Electronics Recycling Act (415 ILCS 151) established a statewide system for recycling and/or reusing a set of electronic devices that are unwanted in Illinois. All electronic waste (e-waste) is regulated by the IEPA and must be disposed of properly.

E-waste generated by University departments is recycled through Central Management Services (CMS) in Springfield, IL. All NIU e-waste must be sent to Property Control located in the Dorland Building. Contact Property Control personnel at 815-753-1437 for more detailed waste disposal instructions. NIU does not accept any e-waste from the outside community. All non-university electronics can be recycled at established DeKalb County collection sites.

6.2.2 Smoke Detectors

Smoke detectors and alarms are important safety devices. During the inspection, testing and maintenance of the University fire alarm systems, these devices are periodically removed from service and must be properly disposed. Smoke detectors typically fall within two categories: photoelectric and ionization.

6.2.2.1 Photoelectric

Photoelectric technology smoke detectors consist of a light-emitting diode (LED) and a photocell. Photoelectric smoke detectors are transferred to Property Management and incorporated into the University's electronic waste recycling program.

6.2.1.2 Ionizing

Ionization sensor smoke alarms contain a small amount of radioactive material (Americium-241) embedded in a gold foil matrix within an ionization chamber. Ionizing smoke detectors are shipped to an outside contractor using approved shipping containers and packaging methods. EHS maintains recycling documentation on file.

6.2.3 Used Oil

This group of waste includes any oil that has been used and is no longer satisfactory for its intended use (e.g., used motor oil, transformer oil, vacuum pump oil, etc.). Used oil is recycled from various operations and applications across campus. EHS maintains recycling documentation on file.

6.2.4 Used Tires

The Transportation Department assumes the responsibility for properly disposing of used tires generated by the University. The Transportation Department uses a registered used tire transporter and keeps all records of used tire shipments on file.

Appendix A

Northern Illinois University

Laboratory Management Plan

1. Introduction

The purpose of this Laboratory Management Plan (LMP) is to standardize the management of chemical waste at Northern Illinois University (NIU) under the Environmental Protection Agency (EPA): Alternative Requirements for Hazardous Waste Determination and Accumulation of Unwanted Material for Laboratories Owned by Eligible Academic Entities (Subpart K). Subpart K regulations are codified in 40 CFR 262 Subpart K, and 35 IAC Part 722 Subpart K of the Illinois Environmental Protection Agency.

This LMP has been developed in accordance with the Subpart K requirements. It delineates the management of all regulated waste materials generated in research labs, teaching labs, art studios, field labs, academic shops and areas that support labs (e.g., chemical stockrooms, prep rooms). It is important to note that the waste management process described in the LMP applies only to laboratories as defined in Section 11. The areas that are not covered under Subpart K will operate as a small quantity generator under 40 CFR 262 and 35 IAC 722. These areas include, but are not limited to, maintenance areas, custodial storage rooms, machine shops, print shops, trade shops, heating plants, residential dining halls, and recreational facilities.

2. Container Labeling

This section defines the requirements for labeling containers used to store Laboratory Wastes (unwanted materials) in laboratories, studios & shops. The requirements established in this section are required for all laboratories, studios and academic shops.

NIU has opted to use the term “Laboratory Waste” as a definition for all unwanted materials, all chemical substances that are expired, used, or generated due to experiments, artwork, or educational demonstrations. This term is used until a formal determination is performed by the Chemical Hygiene Officer or Environmental Protection Specialist. Please refer to Section 11 for the definition of Laboratory Waste.

A label will be used to identify Laboratory Waste in the laboratories, except for unwanted or outdated chemicals. All containers used to store Laboratory Waste must be labeled with the following information:

1. The words “Laboratory Waste”;

2. Accumulation start date of the waste in the container;

3. Information to make a Hazardous Waste determination; or,

4. Information to alert emergency responders to the contents of the container (e.g., name or list of chemicals or hazard classes)

The preferred method for communicating required information is by using a standard Laboratory Waste label. This label includes all the necessary information, including the words *LABORATORY WASTE*, and the *Start of Accumulation Date*, (this is the date waste is first placed in the container), as well as information adequate to both inform emergency responders of the hazards presented by the waste, and sufficient to make a Hazardous Waste determination. The latter information is provided through both a listing of the waste components, and a checklist of hazard properties presented by the waste.

The Laboratory Waste label (see figure 1.) should be applied directly to the container if possible, but if not possible due to size or visibility restrictions, a Laboratory Waste tag may be used.

The following information must be affixed or attached to the waste container or chemical:

1. The words “Laboratory Waste”;

2. Accumulation start date of the waste in the container;

3. Information enough to make a Hazardous Waste determination; or,

4. Information to alert emergency responders to the contents of the container (e.g., name or list of chemicals or hazard classes)

Northern Illinois University

LABORATORY WASTE

Organic/Inorganic

Waste container code: _____

Building and Room #: _____

Date	Substance (By Name)	Amount

Hazard properties (check any applicable):

- ☐ Carcinogen
- ☐ Chlorinated solvents
- ☐ Corrosive: pH____
- ☐ Flammable
- ☐ Heavy Metal
- ☐ Irritant
- ☐ Oxidizer
- ☐ Peroxide former
- ☐ Toxic
- ☐ Sensitizer
- ☐ Shock-sensitive
- ☐ Used
- ☐ Unused
- ☐ Solid
- ☐ Liquid

Wastes must be removed within 6 months of Start of Accumulation in the container. Contact Laboratory Safety Officer (jgable@niu.edu; (815) 753-1610) with questions or pickup.

Figure 1. Laboratory Waste Label

Waste labels can be obtained from Office of Research Compliance, Integrity and Safety (ORCIS), Environmental Health and Safety (EH&S), or a departmental laboratory manager.

In the case of an unwanted or outdated chemical in its original container and is deemed Laboratory Waste, the original manufacturers label may be used only if the label is compliant with the OSHA Globally Harmonized System. Laboratory Waste tag may be affixed to the original container and must be legible. Legible means that is clearly readable with all warnings and contents visible. In addition, the laboratory worker may write legibly the word LABORATORY WASTE to the container and the *Accumulation Start Date*. This is NOT an approved option if any chemical materials other than the ones stated on the original label are stored in the container. The information to be "associated with the container", must still be provided—either on the container itself, or a tag attached to the container.

3. Laboratory Waste Containers

The type of containers used to store Laboratory Waste will be based on the hazardous characteristics of the Laboratory Waste material. ORCIS will provide the appropriate type and size of waste container to the lab or studio. If the generator chooses to use their own waste containers. The type and size should be determined in consultation with ORCIS.

Laboratory Waste containers must always be kept closed unless adding, removing, or bulking waste, or:

1. When venting of a container is necessary;
2. For the proper operation of laboratory equipment, such as the collection of unwanted materials from high performance liquid chromatographs; or,
3. To prevent build-up of pressure in the container.

It is essential to select the appropriate containers for the safe storage and handling of Laboratory Waste. The following provides guidelines for the appropriate selection of containers to be used for the handling of unwanted materials:

1. **Under no circumstances should** food, beverage, or household containers be used to store wastes.
2. Separate containers for liquids and solids
3. Possible secondary reactions should be considered when choosing containers to ensure the compatibility with the entire contents.
4. Containers must be clean and free of polluting agents and must have their original caps or closures.
5. Plastic containers should be made of polyethylene (HDPE or LDPE),
6. Metal containers should never be used for corrosive Laboratory Wastes.

7. If possible, avoid mixing halogenated and non-halogenated solvents in the same waste

container.

8. Avoid mixing oil-based and water-based solvents, paints, and coatings in the same container.

4. Waste Removal and Quantities:

Waste containers, regardless of the remaining capacity of the container, must be removed for disposal within the following established timeframes, or based on total quantities accumulated in a particular laboratory, shop or studio. Contact the Chemical Hygiene Officer or Environmental Protection Specialist by email to request removal of Laboratory Waste.

Time Limit (6 Month): Unwanted materials will be removed from the laboratory using a *rolling 6 months* approach; that is, each container must be removed within 6 months from the container's accumulation start date in accordance with 722.308(a)(2).

Quantity Limits: Regardless of the above time limit for accumulation, Laboratory Wastes must be removed within 7 calendar days, if either of the following total waste quantity limits are exceeded.

55-Gallon Maximum: If a laboratory, studio, shop or support area accumulates a total volume of Laboratory Waste? in excess of 55 gallons: All containers of Laboratory Waste will be removed within 7 calendar days as of the date that 55 gallons was exceeded.

P-Listed Waste Maximum – 1 Quart: If a laboratory accumulates more than 1 quart of any of the following six (6) P-listed reactive acutely hazardous Laboratory Wastes: All containers of Laboratory Waste will be removed within 7 calendar days as of the date that the 1 quart was exceeded.

- P006 – Aluminum phosphide
- P009 – Ammonium picrate
- P065 – Mercury fulminate
- P081 - Nitroglycerine
- P112 - Tetranitromethane
- P122 – Zinc phosphide (> 10%)

Laboratories that generate more than 55 gallons of Laboratory waste or 1 quart of acutely reactive Laboratory Waste, will need to mark on the containers the date the threshold volume of Laboratory Waste is reached. The Chemical Hygiene Officer or Environmental Protection Specialist must be contacted immediately in order to remove the accumulated waste within the required 7-day timeframe. The laboratory workers, instructors, researchers, or graduate assistants assigned to each generation point are responsible to comply with all EPA/IEPA requirements and those established by ORCIS. It is each department's responsibility to ensure compliance with federal, state, and ORCIS requirements, including appropriate labeling, use of correct containers, notification times, and requests for Laboratory Waste removal.

Once the Laboratory Waste is removed from the laboratory by a trained professional (i.e. Chemical Hygiene Officer or Environmental Protection Specialist), the Hazardous Waste determination will be made in the Central Accumulation Area (CAA) within 3 days of the Laboratory Waste arrival. All RCRA applicable requirements for small quantity generators including those in 40 CFR 262.16 and 35 IAC 722.116 will be observed in the CAA. The Hazardous Waste determination may also be made by a trained professional while the Laboratory Waste is at the source (laboratory, art studio, etc.) where the waste was generated, or at the time the material is removed. A contracted waste vendor may also provide trained professionals to aid in the hazardous waste determinations and disposition and disposal of Laboratory Wastes.

5. Hazardous Waste Determination

Unwanted materials will be moved only by Trained Professionals to the Central Accumulation Area (CAA). Only ORCIS and EH&S have access to the CAA. Once the unwanted material is moved to the CAA, the hazardous waste determination will be made within 3 days of the material arriving at the CAA. Within this three-day time frame, the Chemical Hygiene Officer or Environmental Protection Specialist can determine that the material is eligible for re-use, recycling, or may be handled as a non-hazardous waste. Those wastes which are determined to constitute hazardous wastes will be labeled as such on the container, along with the relevant EPA hazardous waste code(s). After the hazardous waste determination is made, all applicable SQG requirements in the CAA will apply.

6. Training

a. Laboratory Workers

All laboratory workers, including students, must receive training on the LMP at least annually. The training must be commensurate with their duties so the employees, faculty, researchers, assistants, and students understand the requirements of the LMP and can implement them.

Three different methods for worker training are implemented:

Classroom Training
All laboratory workers, including staff and students, are trained in laboratory safety at the beginning of each academic year. This laboratory training session includes a section and discussion on chemical waste management, including the contents of the LMP. The departments are responsible for coordinating the necessary training for their laboratory workers and students annually.

Online
Training is offered to laboratory workers who are unable to attend the annual safety training. This training is offered via the NIU Blackboard site and includes a short quiz to ensure comprehension.

Laboratory specific:
Laboratory specific training is provided by ORCIS on a case by case basis. These training sessions are limited and based on the unique needs of a specific research team.

b. Trained Professionals

The Chemical Hygiene Officer and Environmental Specialist are Trained Professionals under the Subpart K RCRA regulations. They are the only personnel allowed to make hazardous waste determinations in the laboratory or studio settings or oversee the transfer of Laboratory Wastes to the CAA. In order to comply with the requirements of Subpart K and to ensure the safe on-site transfers of Laboratory Wastes, only trained professionals will:

1. Accompany the transfer of Laboratory Wastes when they are removed from the laboratory, studio, or support area; either for consolidation in another laboratory or chemical storeroom, or taken to the CAA; and,

2. Make the hazardous waste determination, pursuant to §262.11 (35 IAC 722.111), for Laboratory Wastes).

The Chemical Hygiene Officer and Environmental Protection Specialist receive training in OSHA HAZWOPER, DOT Hazardous Materials, RCRA, Hazard Communication and OSHA Laboratory Safety Standard. Training is refreshed at least annually or as outlined in state or federal regulations.

7. Removing Laboratory Wastes from the Laboratory

The removal method of Laboratory Wastes from the laboratory was described in Section 4 of this LMP. As previously mentioned, the principal method to remove Laboratory Waste from the laboratory will be time based, using a 6-month rolling approach.

The removal of most Laboratory Wastes, however, will be associated with the triannual chemical waste pickups, which are announced throughout the university 2-3 weeks prior to the date of the scheduled waste pickup by the Chemical Hygiene Officer. The subject departments, shops, or areas then notify the ORCIS of the location, quantity, and nature of the wastes they plan to have ready for pickup, on the scheduled dates. These wastes are typically collected by trained professionals for transport to the CAA. The following outlines the estimated pick up dates:

1. Mid-May – after spring semester

2. Late September – early October

3. December -before winter break

NIU promotes consolidation of compatible Laboratory Wastes, allowing containers to be reused whenever possible. Only trained professionals may transfer Laboratory Wastes between laboratories or from a laboratory to a chemical stock room for consolidation. Areas consolidating Laboratory Wastes will be subjected to the Subpart K requirements, including the time and volume limits.

8. Laboratory Clean-out Procedures

It is recommended if the laboratory space substantially changes that a Laboratory Clean-out is performed. The Chemical Hygiene Officer, a waste contractor, and the responsible department will evaluate the laboratory inventory of chemicals and other materials which are no longer needed or that have expired; in order to determine the subsequent removal of those chemicals or other Laboratory Wastes. Conducting a clean-out will be considered for one of the following reasons: It may be on a routine basis (e.g., at the end of a term or academic year); as a result of a renovation, relocation, or change in laboratory or studio occupant; or a change in the research endeavor.

The clean-out process allows for the redistribution of the chemicals. If a laboratory worker determines that a chemical can be used in another laboratory, it would be considered a product and thus not regulated under RCRA. If the determination is made after it is removed from the laboratory, the clean-out chemical would be regulated as an Laboratory Waste until it is redistributed from the CAA to another laboratory for further use.

The laboratory clean-out process allows the disposal or redistribution of chemical products in a 30-calendar day period. Once a clean-out has been declared, Laboratory Waste resulting from unused commercial chemical products will not be counted toward generator status. Generator status will not be affected by the volume of waste generated during this process. The 30-day period will start when Trained Professionals' in coordination with laboratory or studio personnel, begin evaluating the inventory of laboratory chemicals, making the corresponding Hazardous Waste? determination. This process will be led by the Chemical Hygiene Officer who will develop the clean-out schedule.

Clean-outs may only be performed once every twelve (12) months per laboratory. At the conclusion of the laboratory clean-out, all Laboratory Waste must be removed from the laboratory.

All records pertaining to a laboratory clean-out, including the laboratory being cleaned out, the date the laboratory clean-out begins and ends, and the volume and type of Laboratory Waste generated during the laboratory clean-out will be maintained by EH&S. These records will be maintained for a period of 3 years from the date the clean-out ends.

9. Emergency Preparedness

To ensure proper response in case of an emergency in a laboratory or studio, emergency contact information will be posted on every laboratory or studio entry doorway. This list will include contact information for ORCIS staff and the Laboratory Director? both emergency responders on campus and off campus.

An inventory of all chemical materials in laboratories and studios will be kept in CHEMS, our chemical storage inventory system? This information is continually updated and is available to campus administrators and emergency responders through ORCIS. Chemicals that might become dangerous over time, such as peroxide formers, are assigned a 1-year expiration date from the date they are first added to the inventory. The lab owner is required to visually inspect the material prior to the expiration date. If the container and contents are in good condition a 1-year extension is allowed. If either the container or its contents show signs of deterioration or contamination, the possible development of peroxides, or it is one year past the expiration date. the lab worker must notify the Chemical Hygiene Officer or Environmental Protection Specialist. The container will be removed from the laboratory as a Laboratory Waste.

If an unknown chemical is found in a lab or studio space the occupant must immediately contact ORCIS. ORCIS will respond within 7 calendar days to assess the unknown.

All laboratories shall have an adequate spill response kit and all laboratory personnel must be familiar with this equipment and know how to deploy it.

Larger more comprehensive spill kits are in the following areas:

1. Faraday Hall loading dock
2. Montgomery Hall loading dock
3. Still Gym room 116
4. Engineering Building loading dock
5. The Central Accumulation Area

10. Laboratory Management Plan Availability

This plan will be made available to laboratory workers, students, or any others at the University who request it. The plan will also be maintained on the ORCIS website.

This plan will be reviewed annually and revised as needed.

11. Definitions

Art Studio The working place of a painter, sculptor, or photographer.

Central Accumulation Area (CAA) "Central accumulation Area" means any on-site hazardous waste accumulation area with hazardous waste accumulating in units subject to either §262.16 (for small quantity generators) or §262.17 of this chapter (for large quantity generators). A central accumulation area at an eligible academic entity that chooses to operate under 40 CFR part 262 subpart K is also subject to §262.211 when accumulating unwanted material and/or hazardous waste."

College or University A private or public post-secondary degree-granting academic institution that is accredited by an accrediting agency listed annually by the U.S. Department of Education.

EPA United States Environmental Protection Agency

EH&S NIU Environmental Health and Safety Department

IEPA Illinois Environmental Protection Agency

Laboratory An area owned by an eligible academic entity where relatively small quantities of chemicals and other substances are used on a non-production basis for teaching or research (or diagnostic purposes at a teaching hospital) and are stored and used in containers that are easily manipulated by one person. Photo laboratories, art studios, and field laboratories are laboratories within the meaning of this definition. Areas such as chemical stockrooms and preparatory laboratories that provide a support function to teaching or research laboratories (or diagnostic laboratories at teaching hospitals) are also laboratories within the meaning of this definition.

Laboratory clean-out An evaluation of the inventory of chemicals and other materials in a laboratory that are no longer needed, or which have expired and the subsequent removal of those chemicals or other Lab Wastes from the laboratory. A clean-out may occur for several reasons. It may be on a routine basis (e.g., at the end of a semester or academic year) or as a result of a renovation, relocation, or change in laboratory supervisor or occupant. A regularly scheduled removal of Laboratory Wastes, as required by Section 722.308, does not qualify as a laboratory clean-out within the meaning of this definition.

Laboratory Waste All hazardous and non-hazardous substances and materials which are intended to be discarded, scrapped or recycled.

Lab Worker A person who handles chemicals or Laboratory Wastes in a laboratory. This may include, but is not limited to, any member of faculty or staff, a post-doctoral fellow, an intern, a researcher, a technician, a supervisor or manager, or a principal investigator. A person does not need to be paid or otherwise compensated for his or her work in the

laboratory to be considered a laboratory worker. An undergraduate or graduate student in a supervised classroom setting is not a laboratory worker.

LMP Laboratory Management Plan

Machine Shop A workshop in which work is machined to size and assembled.

ORCIS NIU Office of Research Compliance, Integrity and Safety

Trained Professional A person who has completed the applicable RCRA training requirements of 40 CFR 265.16, and is knowledgeable about normal operations and emergencies. A trained professional may be an employee of the eligible academic entity or may be a contractor or vendor who meets the requisite training requirements.

References

U. S. Environmental Protection Agency (EPA): Alternative Requirements for Hazardous Waste Determination and Accumulation of Unwanted Material for Laboratories Owned by Eligible Academic Entities (Subpart K). Subpart K regulations 40 CFR 262 Subpart K

Illinois Environmental Protection Agency (IEPA): 35 IAC Part 722 Subpart K

Date	Reviewed by	Changes
		Initial