

Chemical Waste Minimization & Pollution Prevention Program

Summary: The Temple University Chemical Waste Minimization & Pollution Prevention Program (CWM&PPP) describes the processes and procedures which will be employed by Temple University to minimize the generation of regulated chemical waste.

1. Program Description

Temple University (TU) Environmental Health & Radiation Safety (EHRS) has developed the Chemical Waste Minimization & Pollution Prevention Program (CWM&PPP) to develop and implement policies and procedures which will be employed by the Temple University to minimize the generation of regulated chemical waste. The purpose of this program is to prevent and reduce the use of chemicals which produce hazardous waste through waste minimization and pollution prevention.

2. Scope

This Program applies to all students, faculty, staff, visitors, and contractors that participate in any activity that generates chemical waste of any kind, including but not limited to laboratory, research, operations, maintenance, grounds keeping and academic instruction at Temple University.

3. Responsibilities

3.1. Waste Generators are responsible for:

- Participating in training programs to gain the necessary skills and knowledge to appropriately implement the techniques identified in this program.
- Adhering to the procedures and guidelines provided in this program; and
- Ensuring that all chemical wastes are managed in compliance with the provisions of the most recent edition of the Chemical Waste Minimization & Pollution Prevention Program and associated guidance documents.

3.2. Supervisors / Principal Investigator (PI) / Lab Managers are responsible for:

- Ensuring that all personnel and/or contractors working under their direction are properly trained and adhere to the chemical waste minimization and pollution prevention techniques management concepts and procedures provided in this program as well as any departmental internal procedures.
- Ensuring that all audit findings are immediately corrected and reported back to EHRS; and

- Ensuring that all waste generated are discarded in compliance with the provisions of the most recent edition of the Chemical Waste Minimization & Pollution Prevention Program and associated guidance documents.

3.3. Department Directors / Chairs / Deans

- Responsible for ensuring that Supervisors, PIs, and Managers comply with the concepts and procedures provided in this program.

3.4. Environmental Health & Radiation Safety (EHRS) is responsible for:

- Developing and implementing the Chemical Waste Minimization & Pollution Prevention Program (CWM&PPP).
- Providing training and/or technical guidance on chemical waste minimization and pollution prevention management requirements and procedures to all affected waste generators.
- Ensuring regulatory compliance and acting as the University liaison for regulatory agencies that oversee chemical waste related activities and/or conduct on-site inspections.
- Maintaining chemical waste contracts with vendors; and
- Facilitating chemical waste shipments.

4. Program Components

4.1. General Requirements

Temple University is committed to operating the University chemical waste management program in a fashion that places a high priority on waste minimization and pollution prevention. As required by EPA guidelines, the University has developed a waste minimization and pollution prevention program that includes the following basic elements:

1. Management Support
2. Characterization of Waste Generation
3. Periodic Waste Minimization Assessments
4. Technology Transfer
5. Program Evaluation

4.2. Management Support & Waste Minimization Statement

The University authorizes Environmental Health & Radiation Safety (EHRS) to develop and implement a chemical waste minimization program for regulated chemical waste activities and operations at the University. The primary regulated chemical waste generating operations are teaching/research laboratories and maintenance/facility service activities. Numerous individual laboratories generate research-related wastes.

These sources of chemical waste generation are not easily amenable to the establishment of specific goals for reduction of waste generation. The EHRS website contains information on chemical waste management: disposal procedures, hazardous waste, and spill prevention, EHRS training programs, SDS database, and guidelines containing practical tips.

EHRS is responsible for the continued development, implementation, and recordkeeping tasks of a CWM&PP program.

EHRS submits annual recycling and minimization data to the Office of Sustainability. This EHRS information is merged with University-wide recycling efforts and released to the public.

The University is required by the US. Environmental Protection Agency and the Pennsylvania Department of Environmental Protection (PA-DEP) to develop, implement and certify that:

1. Environmental Health and Radiation Safety has a program in place to reduce volume and toxicity of chemical/hazardous waste to a degree determined by the EHRS Director and staff to be economically practicable; and
2. The proposed method of treatment, storage or disposal is the most practicable method available to the University, which minimizes the present and future threat to human health and the environment.

4.3. Characterization of Waste Generation

EHRS coordinates the characterization and identification, transport, storage, and disposal activities for all regulated chemical wastes generated at Temple University. These wastes are generated on 5 campuses and several satellites areas throughout the Philadelphia region. The Main Campus and the Health Sciences Campus operate as a Large Quantity Generator (LQG). All the other sites operate as either a Small Quantity Generator (SQG) or a Very Small Quantity Generator (VSQG).

There are three general categories of regulated chemical waste generated at the University-assorted waste solvents, discarded chemical products, and general chemical waste.

EHRS utilizes a comprehensive database management system (Onsite-EHSA Web) that assists in providing a correct determination of hazardous waste streams. This allows for safe waste consolidation with other compatible materials; improves the potential for recycling options rather than treatment or incineration; and prevent non-hazardous items from being misrepresented.

EHRS continually reviews and revises both internal and external (Vendor) waste stream profiles for accuracy and opportunities for waste minimization.

4.4. Periodic Waste Minimization Assessment

EHRS advocates the following hierarchy of control practices in the management of chemical/hazardous waste:

1. Prevention through Source elimination or reduction,
2. Product reuse,
3. Environmentally-sound recycling,
4. Environmentally-sound treatment, or
5. Environmentally-sound disposal.

Using these five points as waste minimization targets, the identification of areas where materials can be prevented from becoming a waste or can be recycled can be determined, identification of potential waste reduction and recycling techniques to each waste stream can be determined and other opportunities uncovered.

4.4.1. Source Reduction

Temple University recognizes source reduction as the primary objective of a waste minimization program. Temple University is pursuing source reduction by targeting the following areas:

- Substitution of raw materials
- Green Chemistry
- Inventory Control
- Housekeeping and maintenance
- Process/procedure modification
- Equipment or technology modification

4.4.2. Program Initiatives

Although source reduction is the preferred method of waste minimization., TU recognizes other potential opportunities as secondary, but important means of waste minimization and pollution prevention. Examples include, but not limited to:

- Mercury Thermometer Exchange Program
- Chemical Redistribution Program

Information on these program initiatives as well as other on-going initiatives can be found online at: <https://campusoperations.temple.edu/ehrs/chemical-safety/chemical-safety-programs/chemical-waste-minimization-pollution-prevention>

4.4.3. Off-Site Recycling

This area has grown in recent years to be a major component of the waste minimization program. Examples include, but not limited to:

- Alkaline, NiCd, Lead-Acid and NiMH batteries
- Fluorescent Bulbs
- Mercury Containing Items
- Electrical ballasts
- Acetone

Detailed guidance for chemical waste minimization and pollution prevention techniques and procedures are published in the Temple University Chemical Waste Minimization Manual and associated guidance documents. The most recent version of the manual and associated guidance documents can be found online at: <https://campusoperations.temple.edu/ehrs/chemical-safety/chemical-safety-programs/chemical-waste-minimization-pollution-prevention>

4.5. Technology Transfer

EHRIS takes a proactive role in reducing the quantity and severity of hazardous waste generated at the University. EHRIS is an active member of the Campus Safety, Health and Environmental Management Association (CSHEMA). Through this association and other academic and scientific/trade association. The University has ample opportunities to seek and exchange technical information on all, facets of chemical and waste management efforts and techniques.

4.6. Training

All departments operating laboratories or generating chemical waste must train their personnel on the proper handling of chemical waste and waste minimization strategies. New faculty, staff and students in these departments should be training in these areas as part of their orientation process.

EHRIS is available to offer assistance, but ultimately the department is responsible for training. EHRIS offers training for chemical waste generators in management of chemical waste. Effective training programs that support chemical waste management guidelines will ensure the achievement of goals set forth in CWM&PP program.

5. PROGRAM EVALUATION & IMPLEMENTATION

The chemical waste minimization and pollution prevention program at Temple University is continually evaluated to determine if areas for improvement exists. This program on the campuses continues to expand with the work and efforts of the Computer Recycling Center and the Office of Sustainability.

5.1. Implementation

EHRIS will characterize the waste streams from each area that generates hazardous waste. Generators of hazardous waste will be queried about the availability and feasibility of waste reduction. EHRIS will work with department to implement waste reduction efforts.

5.2. Performance Measures

- Document regulated chemical waste minimization efforts. These records are available in the EHRIS department for review and inspection. A summary of these efforts will be made available on the EHRIS website.
- Review regulated chemical waste reduction results on an annual basis.

5.3. Program Review

This program will be reviewed annually and amended as necessary. When it becomes apparent that the plan is deficient, it will be revised.

Performance measures will be monitored at least annually.

6. RECORDKEEPING

EHSR will keep a record of the waste management plans and associated documentation for at least 5 years.

7. REFERENCES

- US EPA Hazardous Waste Management regulations 40 CFR 260
- Pennsylvania Code titled Chapters 260-270 Hazardous Waste Management Regulations
- Temple University Chemical Waste Minimization Manual