



TEXAS A&M UNIVERSITY
CORPUS CHRISTI

Hazardous Waste Management Program

Compiled by:

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TABLE OF CONTENTS

I. INTRODUCTION	3
II. HAZARDOUS WASTE DISPOSAL REGULATIONS	3
III. HAZARDOUS WASTE DISPOSAL PROGRAM	4
DETERMINATION OF HAZARDOUS WASTE	4
HAZARDOUS WASTE LABELS AND INVENTORY	5
HAZARDOUS WASTE ACCUMULATION	6
HAZARDOUS WASTE REMOVAL REQUESTS	6
DISPOSING OF EMPTY CHEMICAL CONTAINERS	7
IV. GENERAL INFORMATION	7
CLASSIFICATION AND SEGREGATION OF HAZARDOUS WASTE	8
CONTAINMENT AND STORAGE OF HAZARDOUS WASTE	8
DISPOSAL	9
V. EMERGENCY PROCEDURES	10
VI. APPENDIX A – DEFINITIONS	11
VII. APPENDIX B – IDENTIFICATION OF HAZARDOUS WASTE	14
VIII. APPENDIX C – SOURCE REDUCTION AND WASTE	19

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TPDES Permit #: **WQ0004200000**
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I. INTRODUCTION

The purpose of this document is to inform the faculty, staff, and students of Texas A&M University - Corpus Christi (TAMU-CC) regarding State and Federal regulations on hazardous waste disposal and to define the TAMU-CC Hazardous Waste Management Program. The Program pertains to hazardous waste and does not include procedures for the management of radioactive, infectious, and/or biological waste. These procedures are included in the Radionuclide Laboratory Procedure Manual and the Management and Disposal of Biological Waste Manual respectively.

II. HAZARDOUS WASTE DISPOSAL REGULATIONS

Federal and State regulations govern hazardous waste disposal at TAMU-CC. Failure to comply with any hazardous waste regulation may result in substantial fines and penalties for the University. Individuals causing the violation may be personally liable. Violations may range from failure to properly label a container of hazardous waste to intentionally disposing of hazardous waste into the air, down the drain, or in the garbage. A waste generator never totally loses liability for environmental damage. **In Texas, penalties for non-compliance may be civil, criminal, or administrative violations ranging from fines, up to \$25,000 per day, to prison terms for individuals, up to 15 years.**

The Resource Conservation and Recovery Act (RCRA) is administered by the U. S. Environmental Protection Agency (EPA). Under this Act, the EPA has the responsibility for regulating hazardous wastes. RCRA established a "cradle to grave" hazardous waste management requirement to protect public health and the environment from improper disposal of hazardous waste. This law went into effect in 1976.

The Texas Commission on Environmental Quality (TCEQ) administers an equivalent to RCRA for the State of Texas under the Industrial Solid Waste and Municipal Hazardous Waste Regulations (Title 30, Part I, Chapter 335).

The TAMU-CC Environmental, Health and Safety Department (EHS) administers the Hazardous Waste Management Program at TAMU-CC. Compliance with the program is critical and requires full cooperation by all campus entities.

TAMU-CC operates as a Small-Quantity Generator (SQG) of hazardous waste and must comply with State and Federal regulations on waste disposal associated with that classification. The TCEQ and the EPA inspect TAMU-CCs Hazardous Waste Management Program for compliance. The University's permit is applicable to all activities at TAMU-CC that produce waste.

TAMU-CC is not permitted to treat or dispose of waste locally. All waste must be transported to a permitted off-site Treatment, Storage, and Disposal (TSD) facility for further storage, treatment, and/or disposal or recycling. It is illegal to dispose of hazardous waste by dilution, evaporation, or dumping into the sanitary or storm sewers or into the local landfill.

The Texas A&M University System has contracted a TSD facility and waste hauler to perform the final waste pick up, transport, and disposal.

The EHS Department collects, transports on campus, and stores hazardous wastes prior to off-site shipment for final disposal. In addition, EHS provides technical support to individuals and maintains permanent records of all hazardous wastes collected on campus and shipped off campus.

III. HAZARDOUS WASTE MANAGEMENT PROGRAM

The following procedures are intended to comply with applicable Federal and State regulations for the proper management of hazardous waste and to reduce adverse effects to human health and the environment.

Determination of Hazardous waste

A material becomes "waste" when there is no longer a useful need for it, and it should be discarded. If the material is to be discarded, determine whether the waste is non-hazardous or hazardous. A material is "non-hazardous waste" if it does not meet the definition of "hazardous waste". The term "hazardous waste" refers to a discarded, spent, or used chemical or material that is, either listed as a hazardous waste or has the characteristics of hazardous waste.

A material is "hazardous waste" if it meets one or more of the following:

1. It is a chemical listed on one of the Chemical Tables (Appendix B).
2. It is a mixture or solution containing a listed chemical (Appendix B) and a non-hazardous material.
3. It meets the definition from any of the following:
 - a. Ignitability (flashpoint <60°C or supports combustion)
 - b. Reactivity (e.g., responds violently to air or water, cyanides, explosives, unstable chemicals)
 - c. Corrosivity (pH <4 or >10)
 - d. Toxicity (e.g., pesticides, heavy metals, poisons)
 - e. Universal Waste
 - f. Materials that are not excluded or exempt from regulation.

EHS will assist in determining and managing hazardous wastes. Additional information on specific responsibilities and procedures may be obtained by contacting the EHS Department.

Personnel can ensure compliance with Hazardous Waste Management by following a few simple steps:

1. *Never* dispose of chemicals improperly.
 1. Improper disposal includes, but is not limited to:
 - Pouring chemicals down a drain or on the ground.
 - Evaporating the chemicals into the air.
 - Disposing of chemicals with regular trash.
 2. Use leak proof containers, in good condition, that can be closed securely, and is an appropriate material for the chemical.

Hazardous Waste Labels and Inventory

All containers of hazardous waste (including all waste materials generated from a spill clean-up operation) must be properly labeled, inventoried, and stored before being removed from the work area. Waste materials generated from a spill clean-up operation may include, but are not limited to, paper towels, broken glass, neutralizing agents, contaminated water, etc. All these materials must be properly bagged (do not use biohazard bags unless biohazards are included in the spill incident) and, if broken glass or other sharps are included, placed in an appropriate puncture proof container. Hazardous waste labels must be placed on the container when a chemical is first added.

Labels must be filled out in a “**clearly legible**” manner using the following the guidelines:

1. Must include the words “**Hazardous Waste**”
2. Must include the “**Accumulation Start Date**”
3. Must include **full chemical names** or common names (Chemical formulas or abbreviations are not acceptable) and the corresponding Chemical Abstracts Services (CAS) number.
4. If the container holds a mixture of chemicals, list each chemical (including water), the corresponding CAS number for each chemical, and the percent concentration of each chemical.
5. Must indicate the hazard(s) associated with the waste in the container (e.i. flammable, corrosive, toxic, etc.).

All information listed on a Hazardous Waste label must also be included on an inventory. The Hazardous Waste Inventory must include enough detailed information to distinguish individual containers, or groups of containers. The waste inventory should also state the location where the waste is being stored.

NOTE: If waste is placed in secondary containment that can be closed, the secondary containment must also be labeled with the words “Hazardous Waste” and an inventory of the containers of hazardous waste inside. For more information, contact EHS.

Requests for removal of hazardous waste must be submitted to EHS. After the inventory is received, EHS will schedule collection of the waste.

IMPORTANT: Hazardous Waste that is not properly labeled in a “**clearly legible**” manner or properly inventoried will not be removed. The waste removal request will be returned to the requestor explaining why the waste was not removed. The requestor will need to correct the issue and resubmit the waste removal request.

Hazardous Waste Accumulation

1. When reusing a chemical container to accumulate hazardous waste, completely deface or remove the original label.
2. Labels can be attached on or affixed to the container and correlate to an inventory. *Labels and inventories must be legible.*
3. Do **not** mix incompatible chemicals in a single container. Use separate waste containers for different wastes.
4. Do **not** overfill the waste container.
 - a. For liquid hazardous waste:
 - Do not fill jugs and bottles past the “shoulders” of the container. Use vented caps for liquids with higher vapor pressures (e.g., 40mmHg at room temperature). Vented caps with hydrophobic membranes must be used for chemicals sensitive to moisture.
 - Fill closed head cans (5 gallons or less), leaving approximately two inches of space between the liquid level and the top of the container.
 - Fill closed head drums (larger than 5 gallons), leaving approximately four inches of space.
 - b. For solid hazardous waste materials, do not fill beyond the weight capacity of the container, and leave at least two inches head space for closure.
5. Keep waste containers closed. Waste containers should only be open when adding or removing material.

Hazardous Waste Removal Requests

1. All requests to have hazardous waste removed from satellite accumulation areas (SAAs) must be submitted through SmartSheets using the form located at: (<https://app.smartsheet.com/b/form/56855d4e46994c429ae80a0a83e6e754>).
2. Any requests that do not contain all required information will be returned to the requestor until all required information is provided.
3. Requestors will not be able to submit hazardous waste removal requests to have wastes removed from laboratories until the laboratory has been properly registered with EHS and provided a current chemical inventory for the lab. Lab registration and chemical

inventories must be submitted through SmartSheets using the form located at: (<https://app.smartsheet.com/b/form/a3751cacae79444f976b5babae7666c4>).

Disposing of Empty Chemical Containers

Empty chemical containers may be disposed of in the regular trash provided the following EPA requirements are met:

1. Containers must not contain free liquid or solid residue.
2. Containers must be triple rinsed.
 - a. Liquid from triple rinsing processes must be emptied into the appropriate hazardous waste collection container for proper disposal. Never pour this liquid down drains.
3. Product labels must be defaced or removed.
4. Container lids or caps must be removed.
5. Metal containers and plastic jugs must be rendered unusable by punching holes in the bottom of the containers before disposing of them in the regular trash. It is not necessary to break empty glass containers.

IMPORTANT: Containers that do not meet the requirements mentioned here must be treated as hazardous waste.

Contact EHS for more information on hazardous waste procedures and regulations as well as information on waste reduction and minimization.

IV. GENERAL INFORMATION

1. Non-hazardous waste may be disposed of using the sanitary sewer or regular trash provided nothing is contaminated. Examples include:
 - a. Unbroken glass and plastic that has been washed or decontaminated from chemical or biological hazards
 - b. Weighing boats
 - c. Paper napkins, towels, and gloves
 - d. Triple rinsed and uncapped empty bottlesAdditional information about non-hazardous waste disposal can be obtained from EHS.
2. Contaminated waste items must be sealed inside a durable plastic bag (common light weight household trash bags will not suffice).
 - a. A hazardous waste label must be placed on the bag identifying the chemical contaminant(s).
 - b. If the contaminated items include any instruments or tools that may puncture the plastic bag then the entire sealed bag must also be placed inside a puncture proof container, such as a 5-gallon plastic bucket, sealed with a tight fitting lid that is taped shut, and labeled with a hazardous waste label identifying the chemical contaminant(s).

3. Written procedures must be included in the laboratory protocols; hazardous chemicals cannot be treated to reduce the hazard or the quantity of waste in the laboratory.
4. Gas cylinders should be returned to the manufacturer or distributor whenever possible. Non-returnable cylinders should be labeled as hazardous waste.
5. Photographic lab waste containing **silver** must be disposed as hazardous waste. However, some new developing equipment includes a filtration system that removes the **silver**. Photographic lab effluent that does not contain silver may be discarded through the sanitary sewer system. **Please notify EHS if you have this type of equipment.**
6. "Mixed Waste" (includes both radioactive material and hazardous chemicals) should be initially routed through the EHS Radiation Safety Officer.
7. Chemical waste that is unknown may be picked up by EHS. Requests to collect unknown waste must be submitted through SmartSheets in the same manner as all other wastes and enter "unknown" for the chemical constituents. The waste must be placed in a properly sealed container. Place a waste disposal label on the container using "unknown" for the chemical description. **Departments requesting disposal of unknown waste will be charged for the cost of handling and analysis necessary to determine the chemical identity for proper disposal.**
8. Unused, time-sensitive chemicals, such as those that form peroxides, should not be kept longer than twelve months from purchase or six months after opening (expiration dates). Responsible parties must submit a request to EHS to have the outdated chemicals collected for disposal within 120 days of the expiration date. **Failure to request disposal of expired, unused chemicals within 120 days will result in the responsible department being charged for associated disposal costs.** If stratification of liquids, precipitate formation, and/or change in color or texture is noted, do not touch the container, a hazard exists, contact EHS immediately.

Classification and Segregation of Hazardous Waste

1. Hazardous waste is categorized into the following hazard groups.
 - a. Halogenated solvents
 - b. Non-halogenated solvents
 - c. Acids
 - d. Bases
 - e. Heavy metals
 - f. Poisons
 - g. Reactive
 - h. Ignitable
2. Incompatible types of hazardous waste must not be mixed in the same waste container.
3. Do not combine inorganic heavy metal compounds and organic solvents.
4. Do not combine non-hazardous waste with hazardous waste.
5. Paper or wood materials contaminated with flammable or toxic chemicals must be double bagged in heavy-duty plastic bags and must be treated as hazardous waste.

Containment and Storage of Hazardous Waste

1. Personnel must maintain control and accessibility of waste storage areas referred to as satellite accumulation areas (SAAs).
2. Personnel must ensure hazardous wastes are collected, labeled, and stored to prevent human exposure or environmental release.
3. Incompatible chemicals and materials must be stored separately.
4. Waste containers must be compatible with the chemical contents. Containers must be in good condition with no leaks. All containers must have suitable screw caps or other means of secure closure. Contact EHS for more information regarding appropriate container types and sizes.
5. Never overfill hazardous waste containers. Expansion and excess weight can lead to spills, explosions, and/or environmental contamination.
 - a. Containers of solids must not be filled beyond their weight and volume capacity.
 - b. Jugs and bottles should not be filled above the shoulder of the container. Use vented caps for liquids with higher vapor pressures (e.g., 40mmHg at room temperature). Vented caps with hydrophobic membranes must be used for chemicals sensitive to moisture.
 - c. Closed head cans (5 gallons or less) should have at least two inches of headspace between the liquid level and the head of the container.
 - d. Closed head drums (larger than 5 gallons) should have at least four inches of headspace.
6. Containers must be closed or sealed to prevent leakage. All waste containers must remain closed except when adding or removing material.
7. In addition to the above, personnel must ensure:
 - a. The area is secured from "Unauthorized Entry" and emergency contact information is posted.
 - b. Waste is stored only within the SAA that it was generated and within secondary containment, no transportation to other areas is allowed.
 - c. These areas are accessible to EHS personnel.
 - d. Hazardous waste is separated from non-waste chemicals.
 - e. That less than 55 gallons of non-acute hazardous waste and/or less than one quart of acutely hazardous waste is being stored at any single SAA.
 - f. Spill Control Equipment and cleanup supplies (including personal protective equipment) are readily available within the area where the waste is generated.

Disposal

1. It is illegal to dispose of hazardous chemicals in any of the following ways:
 - a. Poured into the sanitary sewer or drain.
 - b. Evaporation in a fume hood.
 - c. Placed in the regular trash.
2. **Generators are reminded that individuals who illegally dispose of hazardous wastes can be held criminally liable and prosecuted under the law.**

3. All efforts should be made to reuse empty containers for the purpose of collecting chemical waste generated from use of the original chemical product.
 - a. All waste generators are responsible for providing their own waste containers.
4. Empty containers can be placed with other non-hazardous waste when the following requirements are satisfied. EPA regulations stipulate that an empty chemical container must:
 - a. Not contain free liquid or solid residue.
 - b. Be triple rinsed.
 - c. Have the label removed or defaced.
 - d. Have the lid or cap removed.
 - e. Have a hole punched in the bottom (metal or plastic containers when placing in a dumpster as non-hazardous waste).

V. EMERGENCY PROCEDURES

TAMU-CC Hazard Communication Program requires that TAMU-CC employees be informed of hazardous materials that they might use or be exposed to at work. In addition, the program should include training on handling spills and other emergencies. Safety Data Sheets are a source of this information and should be maintained for all chemicals used or stored within a workplace. Special cleanup supplies (including personal protective equipment) should be available, and employees should be trained on how to use these supplies. The EHS Department can provide additional information on handling specific chemical spills and is equipped and trained to assist with hazardous material spills. Contaminated clothing, rags, absorbent materials, or other waste from cleanup of spills or leaks must be properly disposed of. All labs should post emergency numbers to be used and develop a response scenario for emergencies.

Emergency telephone numbers of importance are listed below:

City of Corpus Christi Emergency Dispatch	911
TAMU-CC University Police Department	825-4444
TAMU-CC EHS Department	825-5555
TAMU-CC National Spill Control School	825-3333
University Health Center	825-2601
Facilities Service	825-2324
Poison Control Center	1-800-222-1222

APPENDIX A

Definitions

Central Accumulation Area

Site designated to be used for the storage of hazardous wastes prior to shipment to a permitted treatment, storage, and disposal facilities.

EPA Identification Number

The number assigned by the Environmental Protection Agency to each generator, transporter, and processing, storage, or disposal facility.

Facility

Includes all contiguous land and structures, other appurtenances, and improvements on the land used for storing, processing, or disposing of municipal hazardous waste or industrial solid waste.

Generator

Any *person*, by site, who produces municipal hazardous waste or industrial solid waste; any person who possesses municipal hazardous waste or industrial solid waste to be shipped to any other person; or any person whose act first causes the solid waste to become subject to regulation. *Person* refers to an individual, trust, firm, corporation, Federal Agency, State, political subdivision of a State, municipality, or any interstate body.

Hazardous Material

A substance or material, including a hazardous substance, which has been determined by the Secretary of Transportation to be capable of posing an unreasonable risk to health, safety, and property when transported in commerce, and which has been so designated.

Hazardous Waste

Any solid waste material listed or identified in Title 40 Code of Federal Regulations, Part 261, Subpart C and D or exhibiting the characteristics of ignitability, corrosivity, reactivity, or toxicity also defined in Part 261. Tables containing the listing and characteristics of hazardous wastes are shown in Appendix B.

Manifest

A legal document containing required information, which must accompany shipments of Municipal Hazardous Waste or Class I Industrial Solid Waste transported on public roads or thoroughfares.

Mixed Waste

A radioactive waste that is also a hazardous waste.

Permit

A written document issued by EPA or TCEQ that, by its conditions, authorizes the construction, installation, modification, or operation of a specified municipal hazardous waste or industrial solid waste storage, processing, or disposal facility in accordance with specified limitations.

Processing

The extraction of materials, transfer, volume reduction, conversion to energy, or other separation and preparation of solid waste for reuse or disposal, including the treatment or neutralization of hazardous waste, designed to change the physical, chemical, or biological character or composition of any hazardous waste so as to neutralize such waste, or as to recover energy or material from the waste or so as to render such waste non-hazardous or less hazardous; safer to transport, store, and dispose; or amenable for recovery, amenable for storage, or reduced in volume.

Recyclable Material

Wastes that are recycled. Recycled material is used, reused, or reclaimed.

Reclaimed Material

Is processed or regenerated to recover a usable product.

Release

The discharge, deposit, injection, dumping, spilling, or placing of any solid waste or hazardous waste (whether containerized or non-containerized) into or on any land or water so that such solid waste or any constituent thereof may enter the environment or be emitted into the air or discharged into any water, including ground waters.

Satellite Accumulation Area

An area, system, or structure used for temporary accumulation of hazardous waste prior to transport to the central accumulation area.

Solid Waste

Any garbage, refuse, sludge from a waste treatment plant, water treatment plant, or air pollution control facility or other discarded material, including solid, liquid, semisolid, or contained gaseous material resulting from industrial, municipal, commercial, mining, and agricultural operations and from community and institutional activities.

Storage

The holding of solid waste for a temporary period, at the end of which the waste is processed, disposed of, recycled, or stored elsewhere.

Texas Solid Waste Number

The number assigned by the TCEQ to each generator, transporter, and processing, storage, or disposal facility.

Transporter

Any person who conveys or transports municipal hazardous waste or industrial solid waste by truck, ship, pipeline, or other means.

Universal Waste

Any hazardous waste subject to 40 CFR Part 273 and TAC335.261 to include:

- Batteries
- Recalled pesticides
- Mercury containing equipment
 - Mercury containing equipment with evidence of damage or leakage must be managed as hazardous waste.
- Lamps
- Paints and paint-related wastes

Use Constituting Disposal

Recycling process that involves the direct placement of wastes, or products containing wastes, on the land.

Waste

Any material for which there is no use and is to be discarded as valueless.

APPENDIX B

Identification of Hazardous Waste

40 CFR 261.21 Characteristic of ignitability

- a. A solid waste exhibits the characteristic of ignitability if a representative sample of the waste has any of the following properties:
 1. It is a liquid, other than a solution containing less than 24 percent alcohol by volume and at least 50 percent water by weight, that has a flash point less than 60 °C (140 °F), as determined by using one of the following ASTM standards: ASTM D93-79, D93-80, D3278-78, D8174-18, or D8175-18 as specified in SW-846 Test Methods 1010B or 1020C (all incorporated by reference, see [§ 260.11 of this subchapter](#)).
 2. It is not a liquid and is capable, under standard temperature and pressure, of causing fire through friction, absorption of moisture or spontaneous chemical changes and, when ignited, burns so vigorously and persistently that it creates a hazard.
 3. It is an ignitable compressed gas.
 - i. The term “compressed gas” shall designate any material or mixture having in the container an absolute pressure exceeding 40 p.s.i. at 70 °F or, regardless of the pressure at 70 °F, having an absolute pressure exceeding 104 p.s.i. at 130 °F; or any liquid flammable material having a vapor pressure exceeding 40 p.s.i. absolute at 100 °F as determined by ASTM Test D-323.
 - ii. A compressed gas shall be characterized as ignitable if any one of the following occurs:
 - A. Either a mixture of 13 percent or less (by volume) with air forms a flammable mixture or the flammable range with air is wider than 12 percent regardless of the lower limit. These limits shall be determined at atmospheric temperature and pressure. The method of sampling and test procedure shall be the ASTM E 681-85 (incorporated by reference, see [§ 260.11 of this subchapter](#)), or other equivalent methods approved by the Associate Administrator, Pipeline and Hazardous Materials Safety Administration, U.S. Department of Transportation.
 - B. It is determined to be flammable or extremely flammable using 49 CFR 173.115(l).
 4. It is an oxidizer. An oxidizer for the purpose of this subchapter is a substance such as a chlorate, permanganate, inorganic peroxide, or a nitrate, that yields oxygen readily to stimulate the combustion of organic matter.
 - i. An organic compound containing the bivalent -O-O- structure and which may be considered a derivative of hydrogen peroxide where one or more of the hydrogen atoms have been replaced by organic radicals must be classed as an organic peroxide unless:
 - A. The material meets the definition of a Division 1.1, 1.2, or 1.3 explosive, as defined in [§ 261.23\(a\)\(8\)](#), in which case it must be classed as an explosive,

- B. The material is forbidden to be offered for transportation according to [49 CFR 172.101](#) and [49 CFR 173.21](#),
 - C. It is determined that the predominant hazard of the material containing an organic peroxide is other than that of an organic peroxide, or
 - D. According to data on file with the Pipeline and Hazardous Materials Safety Administration in the U.S. Department of Transportation, it has been determined that the material does not present a hazard in transportation.
- b. A solid waste that exhibits the characteristic of ignitability has the EPA Hazardous Waste Number of D001.

40 CFR 261.22 Characteristic of corrosivity

- a. A solid waste exhibits the characteristic of corrosivity if a representative sample of the waste has either of the following properties:
 - 1. It is aqueous and has a pH less than or equal to 2 or greater than or equal to 12.5, as determined by a pH meter using Method 9040C in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication SW-846, as incorporated by reference in [§ 260.11 of this chapter](#).
 - 2. It is a liquid and corrodes steel (SAE 1020) at a rate greater than 6.35 mm (0.250 inch) per year at a test temperature of 55 °C (130 °F) as determined by Method 1110A in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication SW-846, and as incorporated by reference in [§ 260.11 of this chapter](#).
- b. A solid waste that exhibits the characteristic of corrosivity has the EPA Hazardous Waste Number of D002.

40 CFR 261.23 Characteristic of reactivity

- a. A solid waste exhibits the characteristic of reactivity if a representative sample of the waste has *any* of the following properties:
 - 1. It is normally unstable and readily undergoes violent change without detonating.
 - 2. It reacts violently with water.
 - 3. It forms potentially explosive mixtures with water.
 - 4. When mixed with water, it generates toxic gases, vapors or fumes in a quantity sufficient to present a danger to human health or the environment.
 - 5. It is a cyanide or sulfide bearing waste which, when exposed to pH conditions between 2 and 12.5, can generate toxic gases, vapors or fumes in a quantity sufficient to present a danger to human health or the environment.
 - 6. It is capable of detonation or explosive reaction if it is subjected to a strong initiating source or if heated under confinement.
 - 7. It is readily capable of detonation or explosive decomposition or reaction at standard temperature and pressure.
 - 8. It is a forbidden explosive as defined in [49 CFR 173.54](#), or is a Division 1.1, 1.2 or 1.3 explosive as defined in [49 CFR 173.50](#) and [173.53](#).

- b. A solid waste that exhibits the characteristic of reactivity has the EPA Hazardous Waste Number of D003.

40 CFR 261.24 Toxicity characteristic

- a. A solid waste (except manufactured gas plant waste) exhibits the characteristic of toxicity if, using the Toxicity Characteristic Leaching Procedure, test Method 1311 in “Test Methods for Evaluating Solid Waste, Physical/Chemical Methods,” EPA Publication SW-846, as incorporated by reference in [§ 260.11 of this chapter](#), the extract from a representative sample of the waste contains any of the contaminants listed in table 1 at the concentration equal to or greater than the respective value given in that table. Where the waste contains less than 0.5 percent filterable solids, the waste itself, after filtering using the methodology outlined in Method 1311, is considered to be the extract for the purpose of this section.
- b. A solid waste that exhibits the characteristic of toxicity has the EPA Hazardous Waste Number specified in Table 1 which corresponds to the toxic contaminant causing it to be hazardous.

Table 1 – Maximum Concentration of Contaminants for the Toxicity Characteristic

EPA HW No. ¹	Contaminant	CAS No. ²	Regulatory Level (mg/L)
D004	Arsenic	7440-38-2	5.0
D005	Barium	7440-39-3	100.0
D018	Benzene	71-43-2	0.5
D006	Cadmium	7440-43-9	1.0
D019	Carbon tetrachloride	56-23-5	0.5
D020	Chlordane	57-74-9	0.03
D021	Chlorobenzene	108-90-7	100.0
D022	Chloroform	67-66-3	6.0
D007	Chromium	7440-47-3	5.0
D023	o-Cresol	95-48-7	⁴ 200.0
D024	m-Cresol	108-39-4	⁴ 200.0
D025	p-Cresol	106-44-5	⁴ 200.0
D026	Cresol	1319-77-3	⁴ 200.0
D016	2, 4-D	94-75-7	10.0
D027	1, 4-Dichlorobenzene	106-46-7	7.5
D028	1, 2-Dichloroethane	107-06-2	0.5
D029	1, 1-Dichloroethylene	75-35-4	0.7
D030	2, 4-Dinitrotoluene	121-14-2	0.13
D012	Endrin	72-20-8	0.02
D031	Heptachlor (and its epoxide)	76-44-8	0.008
D032	Hexachlorobenzene	118-74-1	0.13
D033	Hexachlorobutadiene	87-68-3	0.5
D034	Hexachloroethane	67-72-1	3.0

D008	Lead	7439-92-1	5.0
D013	Lindane	58-89-9	0.4
D009	Mercury	7439-97-6	0.2
D014	Methoxychlor	72-43-5	10.0
D035	Methyl ethyl ketone	78-93-3	200.0
D036	Nitrobenzene	98-95-3	2.0
D037	Pentachlorophenol	87-86-5	100.0
D038	Pyridine	110-86-1	³ 5.0
D010	Selenium	7782-49-2	1.0
D011	Silver	7440-22-4	5.0
D039	Tetrachloroethylene	127-18-4	0.7
D015	Toxaphene	8001-35-2	0.5
D040	Trichloroethylene	79-01-6	0.5
D041	2, 4, 5-Trichlorophenol	95-95-4	400.0
D042	2, 4, 6-Trichlorophenol	88-06-2	2.0
D017	2, 4, 5-TP (Silvex)	93-72-1	1.0
D043	Vinyl chloride	75-01-4	0.2

¹Hazardous waste number.

²Chemical abstracts service number.

³Quantitation limit is greater than the calculated regulatory level. The quantitation limit therefore becomes the regulatory level.

⁴If o-, m-, and p-Cresol concentrations cannot be differentiated, the total cresol (D026) concentration is used. The regulatory level of total cresol is 200 mg/l.

Subpart D – Lists of Hazardous Wastes

40 CFR 261.30 General.

- a. A solid waste is a hazardous waste if it is listed in this subpart, unless it has been excluded from this list under [§§ 260.20](#) and [260.22](#).
- b. The Administrator will indicate his basis for listing the classes or types of wastes listed in this subpart by employing one or more of the following Hazard Codes:

Ignitable Waste	(I)
Corrosive Waste	(C)
Reactive Waste	(R)
Toxicity Characteristic Waste	(E)
Acute Hazardous Waste	(H)
Toxic Waste	(T)

Appendix VII identifies the constituent which caused the Administrator to list the waste as a Toxicity Characteristic Waste (E) or Toxic Waste (T) in [§§ 261.31](#) and [261.32](#).

- c. Each hazardous waste listed in this subpart is assigned an EPA Hazardous Waste Number which precedes the name of the waste. This number must be used in complying with the notification requirements of Section 3010 of the Act and certain recordkeeping and reporting requirements under [parts 262](#) through [265](#), [267](#), [268](#), and [270 of this chapter](#).
- d. The following hazardous wastes listed in [§ 261.31](#) are subject to the generator category limits for acutely hazardous wastes established in table 1 of [§ 262.13 of this subchapter](#): EPA Hazardous Wastes Nos. F020, F021, F022, F023, F026 and F027.

40 CFR 261.31 Hazardous wastes from non-specific sources

This section includes F-listed waste codes.

40 CFR 261.32 Hazardous waste from specific sources.

This section includes K-listed waste codes.

40 CFR 261.33 Discarded commercial chemical products, off-specification species, container residues, and spill residues thereof.

This section includes P-listed waste codes.

APPENDIX C

Source Reduction and Waste Minimization Plan

Environmental Commitment Statement

All lands held or managed by the Texas A&M University System, including trust lands and Permanent University Fund Lands, should be managed in a manner that will assure the proper use and protection of natural resources, and the environment, for the benefit of all.

Each component, institution, and agency of the Texas A&M University System are expected to establish and maintain a standing committee, and such other committees and subcommittees as necessary, to address and monitor compliance with applicable environmental, health and safety guidelines, standards, laws, regulations, ordinances, and permit or license requirements.

Accordingly, all employees of Texas A&M University-Corpus Christi shall perform their duties in compliance with all applicable Federal, State, and local environmental laws, regulations, and ordinances. The TAMU-CC Environmental Committee and the TAMU-CC University Safety Committee are charged with ensuring health, safety, and environmental considerations and guidance is provided to university administration and community.

Additionally, the TAMU-CC Environmental, Health & Safety Department is committed to ensuring compliance, providing appropriate training, and promoting awareness so that administrators, supervisors, employees, and students can perform their duties and conduct activities in an environmentally responsible and safe manner. To this end, guidance and technical support is provided to develop, implement, and maintain the university's environmental and safety programs.

Further, Texas A&M University-Corpus Christi is committed to make reasonable efforts to minimize waste generated by TAMU-CC activities and to achieve the goals set out in Governor's Executive Order AWR-92-2, Texas Waste Reduction Policy Act (1991) and other applicable requirements.

Source Reduction and Waste Minimization

A. Introduction

Early federal regulations on disposal of hazardous waste were aimed at controlling pollution of the environment. Today, the focus is shifting from controlling pollution to preventing pollution. The Pollution Prevention Act of 1990 (Federal Regulation) made the prevention of pollution and reduction of waste generation a national priority. Texas Waste Reduction Policy Act (Senate Bill 1099 of 1991) requires industries, businesses, and institutions that generate hazardous waste or release toxins into the environment to prepare a Source Reduction and Waste Minimization Plan. Presently, this plan will influence the activities at Texas A&M University-Corpus Christi. To this end, the TAMU-CC Environmental, Health & Safety Department shall coordinate the development and implementation of appropriate procedures.

The cost of commercial waste disposal continues to rise, and the amount of waste generated continues to increase. Although we cannot control disposal costs, the amount of waste that would be generated can be reduced. Emphasis is placed on "Front-end waste minimization" (reducing the amount and toxicity of hazardous materials used) as the primary means for reducing hazardous waste. At TAMU-CC, research and teaching laboratories and other working groups (Facilities Services, etc.) should examine their purchasing practices and systems, their chemical usage, and workplace activities to identify potential points of their operations where source reduction and waste minimization can be implemented.

Reduction of the volume and hazard of chemical waste benefits the public by protecting their health and safety, the environment, and by reducing disposal costs. The volume and type of hazardous waste disposed of determines these costs. Volume of waste can be reduced through source reduction and by recycling. Texas A&M University-Corpus Christi's approach is intended to fulfill the requirements of the law, to achieve economic benefits, and to be an extension of the Texas A&M University-Corpus Christi's Environmental Philosophy.

B. Hazardous Waste Streams at Texas A&M University-Corpus Christi

Texas A&M University-Corpus Christi generates several waste streams. Many times, there are not EPA approved methods for source reduction and minimization for these lab waste streams. For this reason, laboratories face a greater challenge in managing hazardous waste. Below is a list of the broad categories of the waste streams generated at TAMU-CC.

Texas Waste Code	Waste Description
0001103H	Spent acid liquid from lab operations. Corrosive.
0002204H	Flammable solvent waste from lab operations. Flammable.
0003003H	Mixed lab packs from miscellaneous lab operations.
0004209H	Paint waste, excess and unused from facilities maintenance operations.
0005202H	Unused and excess freon liquid from refrigeration processes. Poisonous liquid.
0006801H	Unused and excess organic gasses.
0007003H	Flammable and toxic Liquid.
0008004H	Lab pack containing acute hazardous waste.
0501203H	Spent solvent from parts cleaning.
0523211H	Paint related waste/paint gun cleaner.
0629119H	Photographic waste.
0630117H	Mercury debris from broken thermometers.
0631407H	Phenol/chloroform/acid/flammable/hazardous slam pack debris.
0632110H	Inorganic base consolidated with D002 code. Caustic aqueous waste.
0633219H	Used formalin and water.
0634302H	Soil contaminated with arsenic.
0635209H	Flammable waste liquid waste mineral spirits, spent adhesive, paint.

0636209H	Spent floor coating material.
4409219H	Flammable waste liquid UN 1993 waste mineral spirits, spent adhesive, paint.
4410407H	Calcium hypochlorite, general oxidizer.
4411119H	Bulk oxidizing/corrosive liquids.
4412201H	Waste ethanol solutions.
4413119H	Waste mercuric chloride.
4414319H	Debris from a containment basin used to catch spilled metals and slag from the forging and casting process.

C. Source Reduction and Waste Minimization Goals

1. Comply with all government regulations regarding management of hazardous waste.
2. Manage hazardous waste using the most responsible and environmentally sound methods.
3. Increase the awareness of all employees of their responsibility for reducing hazardous waste and pollution prevention.
4. Improve the effectiveness and efficiency of the waste management program and reduce the costs of waste handling and disposal.
5. Reduce the risk to human health and environment by proper waste management.

D. Source Reduction Techniques

1. Chemical/ Equipment Purchases and Inventory Control
 - a. Utilize chemical management tools for chemical purchase and inventory control. Maintaining current chemical inventories will prevent over ordering new chemicals and disposing of chemicals after expiration. Usable chemical, in good condition, can be exchange between laboratories, Departments, Colleges, etc. Contact TAMU-CC EHS for assistance.
 - b. Negotiate contracts with chemical suppliers to gain volume discounts based on annual volume of chemicals purchased. In these contacts, insist on flexible delivery schedules of fewer, smaller-sized containers without cost penalties. This may require centralized purchasing and distribution of all chemicals.
 - c. Purchase reagent chemicals in quantities that are appropriate to the scale of the experiment being used. Limit acquisition of chemicals to quantities required for immediate use. Do not order quantities to obtain special unit cost savings. These savings will normally be lost due to eventual disposal costs if the chemical is not entirely used.
 - d. Obtain compressed gases, when possible, from vendors who will accept return of their empty or partially full cylinders.
 - e. Include waste generation as criteria in equipment selection.
 - f. Rotate chemical stocks to use chemicals before their shelf lives expire.
2. Chemical Usage
 - a. Ensure proper handling and storage of chemical containers. Laboratory safety training is required before entry into work areas with hazardous materials.

- b. Reduce spills and wastes generated by pre-measuring chemicals for use.
- c. Ensure proper labeling of all secondary containers. Replace all deteriorating labels on primary and secondary containers.
- d. Substitute less hazardous chemicals whenever possible. Example:
 - i. biodegradable scintillation cocktails instead of xylene or toluene-based cocktails. Minimize the use of heavy metals (silver, chrome, mercury, barium, cadmium, and lead) chemicals.
- e. Substitute alcohol or electronic thermal monitors for mercury thermometers.
- f. Use No-Chromix, detergents, or enzymatic cleaners instead of sulfuric/chromic acid cleaning solutions for cleaning laboratory glassware.
- g. Minimize solvent waste by reuse, recycle, or substitution.

E. Waste Minimization Techniques

1. Prevent the mixing of different types of waste. Do not put inorganic heavy metal waste in with solvents as this will increase disposal costs. Segregate halogenated waste solvents from non-halogenated waste solvents.
2. Keep waste streams segregated by storing them in separate waste containers. Label waste containers with the full name(s) of the waste material(s) stored in them.
3. Decontaminate and reuse empty containers to prevent them from being handled as hazardous wastes.
4. When possible, redesign experimental protocols so that harmful byproducts are detoxified or reduced in volume as a final step.

F. Employee Awareness and Training Program

Source reduction and waste minimization is a fundamental responsibility of all TAMU-CC students, faculty, and staff. Appropriate training is provided to all employees in laboratories, shops, or other workplaces where hazardous waste is generated. Training and information are provided to employees at the time of their initial assignment to a work area with occupational exposure to hazardous materials. Students enrolled in a course or lab involving hazardous materials are required to complete the laboratory safety training before entering the lab. The TAMU-CC Environmental, Health & Safety Department provides guidance and technical support for development of environmental training for employees and students.

Training is intended to keep personnel informed of issues and technologies related to pollution prevention and waste minimization. Information and training are provided in the following categories:

1. and laws effecting pollution prevention and hazardous waste generation.
2. Required personal protection equipment.
3. Hazardous materials and hazardous waste.
 - a. Proper storage.
 - b. Safe and proper handling.
 - c. Disposal.

- d. Transportation.
- 4. Inventory tracking.
- 5. Acquisition of hazardous materials and equipment.
- 6. Substitution/elimination of hazardous materials.
- 7. Economic/environmental impacts of hazardous waste generation and disposal.