

TITLE

HAZARDOUS CHEMICAL WASTESCOPE

Provincial

APPROVAL AUTHORITY

Clinical Operations Executive Committee

SPONSOR

Nutrition, Food, Linen and Environmental Services

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Waste Management (#ESM-01)

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ESM-01-02

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NOTE: The first appearance of terms in bold in the body of this document (except titles) are defined terms – please refer to the Definitions section.

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OBJECTIVES

- To outline Alberta Health Services' (AHS) procedures for handling, transporting, and disposing of hazardous chemical waste in a safe and efficient manner.
- To prevent environmental contamination, disease transmission, and/or injury to patients, residents, clients, the public, and AHS People (including physicians, volunteers, and other contracted service providers).

APPLICABILITY

Compliance with this document is required by all Alberta Health Services employees, members of the medical and midwifery staffs, Students, Volunteers, and other persons acting on behalf of Alberta Health Services (including contracted service providers as necessary).

ELEMENTS**1. Hazardous Chemical Waste**

- 1.1 Hazardous chemical **waste** consists of unwanted chemical **substances** that have the potential to harm life, property or the environment, and that meet the requirements set out in the *Waste Control Regulation* (Alberta).
- 1.2 Hazardous chemical waste that has the potential to harm life, property or the environment, includes substances, or mixtures of substances (whether solid, liquid, or gaseous), that exhibit characteristics of flammability, corrosiveness, reactivity or toxicity.

- 1.3 All hazardous chemical wastes shall be handled, transported and disposed of in accordance with *Transportation of Dangerous Goods* and the *Alberta Waste Control Regulations*.

2. Hazardous Chemical Waste Exclusions

The following waste types are generally not considered hazardous chemical waste. For confirmation, review the requirements in the *Waste Control Regulation* and the *Alberta User Guide for Waste Managers*:

- a) general waste;
- b) agricultural waste;
- c) domestic sewage;
- d) radioactive waste; and
- e) biomedical waste.

3. Health & Safety

- 3.1 Hazardous chemical waste should always be handled in a safe and efficient manner that minimizes the likelihood of spills, leaks, or exposure and which complies with the AHS Waste Management System (WMS), the *Waste Management* policy (#ESM-01) and associated procedures, and any local site processes.
- 3.2 Education and training for all AHS People required to handle, store, or dispose of hazardous chemical waste materials shall be completed in accordance with AHS *Waste Management* policy (#ESM-01).
- 3.3 Appropriate personal protective equipment (PPE) shall be worn when handling or transporting hazardous chemical waste. The need for PPE should be identified as part of completing the Hazard Identification, Assessment and Control (HIAC) Process. AHS People should speak to their manager if appropriate PPE cannot be located or is not readily available. PPE includes, but is not limited to:
- a) gloves (puncture resistant, chemical resistant, disposable, waterproof);
 - b) apron and/or gown;
 - c) safety glasses, safety goggles or face shield;
 - d) respirator; and/or
 - e) protective footwear (i.e. shoe covers).
- 3.4 AHS *Hand Hygiene* policy (#PS-02) shall be followed at all times. Information on Infection Prevention & Control (IPC) Hand Hygiene and PPE resources are

available through the AHS external website and Insite. Additional information on Respiratory Protective Equipment (RPE) is available on Insite.

- 3.5 AHS People shall immediately report any hazardous chemical waste related hazards or incidents, such as improper packaging, leaks, spills, and/or accidental exposure (including any symptoms or infections that may be related to exposure to hazardous chemical waste) through the AHS Workplace Health & Safety (WHS) MySafetyNet and shall follow AHS policies and procedures, including the *Workplace Health & Safety* policy (#1121), and *Emergency Response Codes* policy (#1132).

4. Hazardous Chemical Waste Segregation

- 4.1 Hazardous chemical waste shall be **segregated** from other waste streams at the point-of-origin. If hazardous chemical waste materials are inadvertently mixed with other waste streams (including biomedical waste), the entire waste stream shall be treated and disposed of as hazardous chemical waste.
- 4.2 Appropriate segregation of hazardous chemical waste materials is important to maintain safety, efficiency, and cost controls.

5. Packaging

- 5.1 Hazardous chemical waste shall be packaged in accordance with the *Transportation of Dangerous Goods Regulations (Canada)*.
- 5.2 Improper packaging poses a significant risk to patients, clients, visitors, and AHS People as it increases the risk of exposure and or injury. It is the responsibility of the waste generator (or area) to ensure that hazardous chemical waste is properly packaged and labelled per sections 5.3 and 6 of this procedure.
- 5.3 Improper packaging creates further risk to waste handlers and increase disposal costs.
- 5.4 Packaging Procedures
- All containers shall be closed except when adding material.
 - Containers shall not be more than three-quarters (3/4) full.
 - Incompatible materials shall not be mixed together in a single container (e.g. organic acids with inorganic acids, oxidizers with organic materials, etc.) (Refer to Appendix A).
 - Wastes shall be stored in containers compatible with the chemicals stored.
 - Halogenated and non-halogenated solvents shall be packaged separately.

- f) Biomedical waste bags shall not be used to package solid hazardous chemical waste.

6. Labelling

Hazardous chemical waste shall be labelled in accordance with the *Transportation of Dangerous Goods Regulations* (Canada). Information on the label shall include:

- a) generator of the hazardous chemical waste (person or department);
- b) origin of waste;
- c) full chemical name(s) (no abbreviations or brand names); and
- d) a complete list of all chemicals in the container, unless properly classified as identified by the *Transportation of Dangerous Goods Regulations* (Canada).

7. Collection and Transportation

- 7.1 Handling of hazardous chemical waste containers should be minimized and done with caution in accordance with local site processes in order to prevent spills, damage to the containers, and exposure.
- 7.2 Hazardous chemical waste should be moved within a facility along a designated transfer route to mitigate exposure to patients, clients, visitors, and AHS People. Detailed information on designated transfer routes is dictated by local site protocols and shall comply with section 7.3 of this procedure.
- 7.3 Health care facilities shall document designated corridors and elevator routes for transporting hazardous chemical waste within the facility.
 - a) The department responsible for hazardous chemical waste pick up within the facility shall be responsible for documenting these routes.
 - b) Planned routes should minimize the passage through patient care, public, and other clean areas.
 - c) AHS People collecting and transporting hazardous chemical waste within the facility shall be trained on appropriate routes prior to collecting waste containers.
 - d) Documented routes shall be available to AHS People required to collect and move hazardous chemical waste.
- 7.4 Three quarters (3/4) full hazardous chemical waste containers shall be collected by properly trained AHS People and moved to **final storage areas**.
- 7.5 Hazardous chemical waste should not be transported with other waste.

- 7.6 Hazardous chemical waste containers transported within an AHS facility, or which have been moved to final **storage**, should not be re-opened.

8. Storage

- 8.1 Hazardous chemical waste is to be properly labelled, documented, and stored.
- 8.2 Some hazardous chemical waste materials can be neutralized and disposed of through the sanitary sewer system. Refer to the Safety Data Sheet (SDS) for more information on how to properly dispose of the hazardous chemical waste material. Only dispose of hazardous chemical waste through the sanitary sewer if it is compliant with local municipal regulations.
- 8.3 Ensure hazardous chemical waste is properly segregated according to chemical compatibility according to the appropriate SDS. Incompatible chemicals should be stored in such manner that they do not come into contact with one another (e.g. stored on different shelves). (Refer to Appendix A).
- 8.4 The following types of hazardous chemical waste shall be segregated from one another:
- a) flammable liquids;
 - b) flammable solids;
 - c) mineral solids;
 - d) organic acids;
 - e) caustics;
 - f) oxidizers;
 - g) perchloric acid;
 - h) water-reactive substances;
 - i) air-reactive substances;
 - j) heat-reactive substances requiring refrigeration; and
 - k) unstable substances (shock-sensitive substances or explosives).
- 8.5 Hazardous chemical waste shall be stored in a secured designated space which does not present a hazard to patients, clients, visitors, or AHS People.
- 8.6 When hazardous chemical waste cannot be immediately removed from an AHS site, a designated Hazardous Waste Storage Room (HWSR) should be utilized. The HWSR shall be:

- a) well-ventilated;
 - b) cool;
 - c) dry;
 - d) be equipped with explosion/corrosion-proof devices and accessories; and
 - e) have a proper fire-suppression system.
- 8.7 The HWSR shall be equipped with grounded cabinets and/or shelving units that have a minimum half (1/2) inch retaining lip for containerized wastes as per the *Alberta Fire Code* (Section 40.1.8.2, Division B). Such cabinets or shelves should be securely fastened to the wall(s) and floor.
- 8.8 Ensure that the HWSR is properly marked or identified as “Hazardous Waste Storage” and is kept locked except when occupied.
- 8.9 HWSR shall be equipped with suitable equipment to handle an emergency situation involving a chemical leak or spill as per the local site processes, the SDS, and the local Code Brown procedure.
- 8.10 Liquid hazardous chemical waste should be stored in a **secondary containment system** so that leakage or spillage can be prevented from entering the sewer system or from spreading into adjacent areas of the storage room.
- 8.11 Corrosive waste materials shall be stored in corrosion-resistant cabinets.
- 8.12 Flammable and/or combustible liquid waste shall be stored in a special flame-resistant cabinet located in the HWSR.
- 8.13 All containers shall be thoroughly checked/inspected to ensure that no leaks are present before either transporting or placing chemical waste materials in the HWSR.
- 8.14 Mixing and/or transferring hazardous chemical waste (e.g. chemicals or solvents) within the HWSR is strictly prohibited.
- 8.15 New users shall complete and submit a Request for *Hazardous Material Service Order Form* (#18961) prior to any hazardous chemical waste **disposal**. (Refer to Appendix B)
- 8.16 The *Hazard Waste Disposal Form* (#18960) should be completed for each container and provided to the licensed hazardous chemical waste carrier upon arrival at the site to pick up the waste materials. (refer to Appendix B)
- 8.17 Access to the HWSR shall be permitted only to authorized AHS People who have been identified by the waste generating department.

- 8.18 An inventory of all hazardous chemical wastes that are stored on-site for longer than a month should be completed.
- 8.19 Hazardous chemical waste should not be kept on site for a period of longer than one (1) year.
- 8.20 The HWSR should be cleaned only after it has been completely cleared of hazardous waste materials. The frequency of cleaning is dictated by the local site protocol.
- 8.21 Inspections of the HWSR are to be completed annually, to check for electrical and/or air-handling faults. This should be conducted by the appropriate designated Facilities Maintenance & Engineering (FM&E) AHS People.

9. Records Retention

- 9.1 Information and records pertaining to hazardous chemical waste shall be maintained in accordance with **regulatory requirements** and the AHS *Records Management Policy* (#1133) and *Records Retention Schedule* Standard of Practice (#1133-01).

DEFINITIONS

Container(s) means any receptacle for the storage of waste.

Contracted service providers mean any non-AHS or wholly owned subsidiary that are contracted to provide direct patient care or operational services.

Disposal means the removal of waste, treated waste, or residue from a facility, off-site waste treatment facility, or transfer station to a final location. Disposal includes placement in a landfill or discharge to a sanitary sewer.

Final storage area means an area where the hazardous chemical waste is transported to and stored just prior to disposal.

Hazardous chemical waste means unwanted substances that have the potential to harm life, property or the environment; and/or contains one or a mixture of chemical compounds (e.g. solvents, reagents, paints, fuels) and is classified as hazardous. Examples of hazardous waste include, but are not limited to:

- Toxic;
- Corrosive (pH 1 - 12 pH);
- Flammable;
- Reactive (explosive, water reactive, shock sensitive);
- Genotoxic (carcinogenic, mutagenic, teratogenic, or otherwise capable of altering genetic material)

Regulatory requirements mean acts, legislation, regulations and bylaws.

Secondary Containment System means a method or system used to prevent unplanned releases of liquid hazardous chemical waste in order to prevent pollution. It is a level of containment that is external (in addition) to the primary mode of containment for liquid hazardous chemical waste.

Segregated (segregation) means the separation of wastes, according to classification, at the point of generation and prior to storage.

Storage means the accumulation of wastes after segregation into a specified container(s).

Substance means any matter that is capable of becoming dispersed in the environment, or is capable of becoming transformed into matter that is capable of becoming dispersed in the environment.

Waste means an unwanted substance or mixture of substances and includes refuse and garbage.

Waste management system means a system for the management and oversight of health care waste for AHS. The system includes, but is not limited to governance documents, standards, criteria, programs and tools.

REFERENCES

- Appendix A: *Chemical Waste Incompatibilities*
- Appendix B: *Arranging and Sending Chemical Waste for Disposal*
- Alberta Health Services Governance Documents:
 - *Biomedical Waste Procedure* (#ESM-01-01)
 - *Emergency Response Codes Policy* (#1132)
 - *Enterprise Risk Management Policy* (#1125)
 - *Hand Hygiene Policy* (# PS-02)
 - *Records Management Policy* (#1133)
 - *Waste Management Policy* (#ESM-01)
 - *Workplace Health & Safety Policy* (#1121) Hazard Identification, Assessment and Control (“HIAC”) Process.
- Alberta Health Services Forms:
 - *Hazardous Waste Disposal Form* (#18960)
 - *Request for Hazardous Material Service Order Form* (#18961)
- Non-Alberta Health Services Documents:
 - *Alberta User Guide for Waste Managers*
 - *Alberta Fire Code*
 - *Canadian Environmental Protection Act*
 - Canadian Standards Association (CSA) *Handling of health care waste materials* (CSA-Z317.10-15).
 - *Environmental Protection and Enhancement Act* (Alberta): Waste Control Regulation
 - *Transportation of Dangerous Goods Act* (Canada)
 - *Occupational Health and Safety Act* (Alberta)
 - *Public Health Act* (Alberta): Nuisance and General Sanitation Regulation

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APPENDIX A

Chemical Waste Incompatibilities

The tables below list general and specific chemical waste incompatibilities. Use the tables below to assist with determining how to pool/segregate specific chemical waste.

Additionally, refer to the SDS for more details.

General Chemical Waste Incompatibilities

Chemical	Keep separate from:
Acids	Bases, organic acids, flammable and/or combustible materials, active metals such as sodium, magnesium and potassium, chemicals which can generate toxic gases upon contact such as sodium cyanide and iron sulfide, caustics
Alkali and alkaline metals	Water
Carbides	Acids
Caustics	Acids
Flammables	Oxidizing agents
Hydrides	Halogenated organic compounds
Hydroxides	Oxidizing agents
Oxides	Chromates, dichromates, chromium trioxide
Peroxidase	Halogens, halogenating agents, hydrogen peroxides and other peroxides, nitric acid and nitrates, perchlorates and chlorates, permanganates, persulfates
Inorganic azides	Acids, heavy metals and their salts, oxidizing agents
Inorganic cyanides	Acids and strong bases
Inorganic nitrates	Acids, metals, nitrates, sulfur
Organic nitrates	Acids, oxidizing agents
Inorganic sulfides	Acids
Organic compounds	Oxidizing agents
Organic acyl halides	Bases, organic hydroxy compounds
Organic anhydrides	Bases, organic hydroxy compounds
Organic halogen compounds	Aluminum metal
Organic nitro compounds	Strong bases
Oxidizing agents	Flammable, combustible materials reducing agents, e.g., zinc, alkaline metals, oxidizing agents
Powdered metals	Acids, oxidizing agents

Specific Chemical Waste Incompatibilities

Chemical	Keep separate from:
Acetic acid	Chromic acid, nitric acid hydroxyl compounds, perchloric acid, peroxides, permanganates
Acetylene	Chlorine, bromine, copper, fluorine, silver, mercury
Alkali metals	Water, carbon tetrachloride and other chlorinated hydrocarbons, halogens, alcohols, aldehydes, ketones, acids
Ammonia	Anhydrous mercury, chlorine, calcium hypochlorite, hydrofluoric acid, iodine, bromine
Ammonium nitrate	Acids, metal powders, chlorates, nitrites, sulfur, flammable liquids, finely divided organic combustibles
Aniline	Nitric acid, hydrogen peroxide
Bromine	Ammonia, acetylene, butadiene, butane, methane, propane or other petroleum gases, hydrogen, turpentine, benzene, sodium carbide, finely divided metals
Carbon	Activated calcium, hypochlorite, all oxidizing agents
Chlorates	Ammonium salts, metal powders, sulfur, finely divided organic combustibles
Chromic acid	Acetic acid, naphthalene, camphor, sulfur, glycerine, flammable liquids in general, turpentine, alcohol
Chlorine	Ammonia, acetylene, butadiene, butane, methane, propane or other petroleum gases, hydrogen, turpentine, benzene, sodium carbide, finely divided metals
Chlorine dioxide	Ammonia, methane, phosphate, hydrogen sulfide
Flammable liquids	Ammonium nitrate, chromic acid, hydrogen peroxide, nitric acid, sodium peroxide, halogens
Hydrocarbons	Fluorine, chlorine, bromine, chromic acid, sodium peroxide
Hydrocyanic acid	Nitric acid, alkali
Hydrofluoric acid	Aqueous and anhydrous ammonia
Hydrogen peroxide	Copper, chromium, iron, most metals or their salts, oxidizing agents, alcohols, acetone, organic materials, aniline, flammable liquids, nitromethane
Hydrogen sulfide	Fuming nitric acid, oxidizing agents
Iodine	Acetylene, ammonia, hydrogen
Mercury	Acetylene, fulminic acid, ammonia
Nitric acid	Acetic acid, aniline, chromic acid, hydrocyanic acid, hydrogen sulfide, flammable liquids, flammable gases
Oxalic acid	Silver, mercury
Perchloric acid	Acetic anhydride, alcohol, paper, wood, bismuth and its alloys
Potassium	Carbon tetrachloride, carbon dioxide, water
Potassium chlorate	Sulfuric acid and other acids
Potassium permanganate	Glycerin, ethylene glycol, benzaldehyde, sulfuric acid
Silver	Acetylene, oxalic acid, tartaric acid, ammonium compounds
Sodium	Carbon tetrachloride, carbon dioxide, water
Sodium peroxide	Ethyl or methyl alcohol, glacial acetic acid, acetic anhydride, benzaldehyde, carbon bisulfite, glycerin, ethylene glycol, ethyl acetate, methyl acetate.
Sulfuric acid	Potassium chlorate, potassium persulfate, potassium permanganate

APPENDIX B

Arranging and Sending Chemical Waste for Disposal

This appendix contains the generalized steps for arranging and sending chemical waste for disposal. Site-specific processes may supplement this information.

Step	Action		Detail
1.	Has the chemical waste been picked up previously?		
	Yes.	Then... Proceed to Step 10.	
	No.	Proceed to Step 2.	
2.	Review the Hazardous Waste Profile Numbers (WP) sheet to determine if the chemical waste has previously been assessed.		<ul style="list-style-type: none"> The numbers can be downloaded from the NFLES Insite team page, under "Waste Management Initiatives" AHS Hazardous Waste Profile Numbers
3.	If a WP is...		
	Available.	Then... Proceed to Step 5.	
	Not available.	Proceed to Step 4.	
4.	Obtain digital copies of the SDS for the constituents of the chemical waste.		
5.	Complete the <i>Hazardous Waste Disposal</i> form.		<ul style="list-style-type: none"> The Hazardous Waste Disposal Form (#18960) can be found on Insite. This form may be completed as the chemical waste container is being filled.
6.	Complete the <i>Request for Hazardous Materials Services Order</i> form.		<ul style="list-style-type: none"> The Request for Hazardous Material Services Order Form (#18961) can be found on Insite.
7.	Contact Terrapure Environmental and:		<ul style="list-style-type: none"> Contact Terrapure Environmental at: albertadispatch@terrapureenv.com
	If a WP is... Then provide the...		
	Available.	<ul style="list-style-type: none"> Completed <i>Request for Hazardous Materials Services Order</i> form and WP Proceed to Step 9. 	
Not available.	<ul style="list-style-type: none"> Completed <i>Hazardous Waste Disposal</i> form, digital copies of the SDS, and completed <i>Request for Hazardous Materials Services Order</i> form. Proceed to Step 8. 		
8.	Terrapure Environmental shall provide a WP.		

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Step	Action	Detail
9.	Indicate the WP is on the label and on the <i>Hazardous Waste Disposal</i> form.	
10.	Attach the <i>Hazardous Waste Disposal</i> form to the waste.	
11.	As per site procedure, place chemical waste in the designated chemical waste pick up location.	<ul style="list-style-type: none">• This may be located in the laboratory or, if available, in a hazardous waste storage room.• The chemical waste container shall meet TDG regulations and does not require additional packaging.