ATTACHMENT II

RCRA - TSCA

WASTE ANALYSIS PLAN

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LIST OF EXHIBITS

LIST OF ACRONYMS

AA	Atomic absorption
ASTM	ASTM International, formerly American Society for Testing and Materials
CB	Chlorinated biphenyl congener
C.F.R.	Code of Federal Regulations
COLIWASA	Composite liquid waste sampler
CPG	(Clean Harbors) Central Profiling group
DOT	United States Department of Transportation
ECD	Electron capture detector
ELCD	Electrolytic conductivity detector
FID	Flame ionization detector
FPD	Flame photometric detector
GC	Gas chromatography
HOC	Halogenated organic compounds
HPLC	High performance liquid chromatography
ICP	Inductively coupled plasma
ICP/MS	Inductively coupled plasma – mass spectrometry
IDL	Instrument detection limit
LDR	Land disposal restrictions (R315-268)/ treatment standards
LEL	Lower explosive limit
PCDD	Polychlorinated dibenzo-p-dioxins
PCDF	Polychlorinated dibenzofurans
PCB	Polychlorinated biphenyls
PFK	perfluorokerosene (compound used to calibrate the exact m/z scale of the CB congeners in the HRGC/HRMS)
PID	Photoionization detector
PPE	Personal protective equipment
RCRA	Resource Conservation and Recovery Act
RF	Response factor

RRF	Relative response factor
RPD	Relative percent difference
RSD	Relative standard deviation
SDS	Safety data sheet
SOP	Standard operating procedures
TCLP	Toxicity characteristic leaching procedure
TOC	Total organic carbon
TSCA	Toxic Substances Control Act
UV	Ultraviolet
UAC	Utah Administrative Code
VO	Volatile organics
VOC	Volatile organic compounds
WAP	RCRA/TSCA Waste analysis plan
WCR	Waste characterization report
WMPS	Waste material profile sheet

RCRA-TSCA WASTE ANALYSIS PLAN

1.0 INTRODUCTION AND PURPOSE

Clean Harbors Grassy Mountain Facility (CHGM) is a Resource Conservation Recovery Act (RCRA) hazardous waste treatment, storage, and disposal facility (TSDF) and accepts solid, liquid, and sludge waste (both in bulk and containers). CHGM accepts waste regulated by Section R315 of the Utah Administrative Code (UAC); waste regulated by the Toxic Substances Control Act (TSCA), 15 U.S.C. § 2601, *et. seq.*; waste regulated by 40 C.F.R. § 761; and asbestos containing waste regulated by 40 C.F.R. §61, Subpart M.

This RCRA-TSCA Waste Analysis Plan (WAP) is a requirement of UAC R315-270 Hazardous Waste Permit Program; UAC R315-264 Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities; UAC R315-268 Land Disposal Restrictions; 40 C.F.R. § 761.75; and 40 C.F.R. § 61, Subpart M. CHGM shall keep a copy of this plan and any approved revisions at the CHGM facility, and the copy shall be available during compliance inspections.

This WAP documents procedures that will ensure CHGM's compliance with all regulatory requirements. This WAP describes the sampling methodologies, analytical techniques, and overall procedures implemented for hazardous wastes accepted or generated at CHGM for treatment, storage, and/or disposal. The WAP is the primary reference document for all waste analysis performed in conjunction with operation (and closure) of CHGM, except for groundwater, which is governed by Module VII and its associated attachments.

Attachment II-3 Appendix I contains the forms CHGM uses to document compliance with this WAP. These forms may be changed without Director of the Division of Waste Management and Radiation Control (Director) approval if they contain equivalent information to the current forms. New forms may be developed to include changes in the regulations, customer needs, facility operations, company policy, or other needs. In addition, these forms may be received, stored, transmitted, and/or retrieved electronically in addition to or instead of paper copies.

The laboratory at CHGM shall meet the Utah Laboratory Certification requirements for each method utilized to implement this WAP.

CHGM strives to maintain compliance with all applicable regulations. As the EPA develops new analytical methods, these methods may be used, where applicable, to demonstrate compliance with the regulation(s). However, CHGM must modify the permit according to Condition I.D.3 prior to implementing a new analytical method.

1.1. DEFINITIONS

The following terms applied within this WAP shall have the following meanings:

Term	Definition
Accept, Accepted, or Acceptance	When it has been determined that a waste shipment received at CHGM conforms to the approved profile (or all discrepancies have been resolved) and CHGM is willing to accept the waste for treatment, storage, and/or disposal.
Accuracy	The degree to which a result of a measurement, calculation, or specification conforms to the correct value or a standard.
Analysis	An approved method by which the value of a particular parameter is determined.
Analyte	The substance being analyzed to determine its presence or quantity.
Analytical Method	A quantitative procedure for determining the specific concentration or characteristic of an analyte.
Approve, Approved, or Approval	This term is used in the context of evaluating a profile. Approval of a waste stream profile occurs after all necessary analyses and evaluations are completed and when the generator is notified.
Aragonite	Clean Harbors Aragonite, LLC (CHA)
Audit	A check on the performance of analysts and assessment of the laboratory's control system and procedures.
Bulk Load	Any individual waste shipment transported to CHGM that is too large to be managed through the Container Management Building (e.g., an intermodal container, end-dump truck, tanker truck, railcar, etc.).
Clean Harbors	Parent corporation of the Grassy Mountain Facility.
Clive	Clean Harbors Clive, LLC (CHC)
Debris	Solid material exceeding a 60 mm (approximately 2-inches) particle size, is intended for disposal, and is a manufactured object; plant; animal matter; or natural geologic material. A mixture of debris that has not been treated to the standards provided by UAC R315-268 and other material shall be subject to regulation as debris if the mixture is comprised primarily of debris, by volume, based on visual inspection. Examples include steel plates, pipe, concrete pieces, duct work, empty drums, glass, rocks, and sealed containers/chemical-containing equipment such as: cathode ray tubes, non-PCB electrical equipment, animal wastes and parts, asbestos containing material (ACM), Tyvek suits, rubber booties and gloves, and paper towels and/or mixtures of these. The following materials are not defined as debris: ▪ Any material for which a specific treatment standard is provided in UAC R315-268, namely lead acid batteries, cadmium batteries, and/or air emission residues, as well as intact containers of hazardous waste that are not ruptured and that retain at least 75% of their original volume.

Term	Definition
Director	The Director of the Division of Waste Management and Radiation Control.
EPA	The United States Environmental Protection Agency Region 8 office in Denver, Colorado.
Generator	Any person, by site, whose act or process produces hazardous waste identified or listed in UAC R315-261 or whose act first causes a hazardous waste to become subject to regulation. "Generator" can include a generator's authorized representative.
Generator Knowledge	Generator knowledge used to make a hazardous waste determination must be supported by information that can include, but is not limited to: ▪ Generator specific process flow diagrams or narrative descriptions of the process generating the waste (should be used in most cases); and/or ▪ Chemical makeup of all ingredients or materials used in the process that generates the waste (should be used in most cases); and/or ▪ Data on waste composition or properties from analysis or relevant testing performed by the generator; and/or ▪ Safety Data Sheets (SDS) and/or product labels or substances used in the process that generates the waste; and/or ▪ Data obtained from approved methods of sampling and laboratory analysis of waste generated from the same process using the same ingredients/materials; and/or ▪ Process knowledge supported with technical data, such as existing or documented waste analysis data or published studies conducted on hazardous wastes generated by processes similar to that which generated the waste; and/or ▪ Incidents of human injury or environmental damage attributed to the waste; and/or ▪ Information on the properties of waste constituents or, in cases of newly listed wastes, data from recent waste analyses performed prior to the effective date of the listings; and/or ▪ List of constituents that CHGM knows or has reason to believe are byproducts or side reactions to the process that produces the waste; and/or ▪ Data obtained from literature regarding waste produced from a similar process using the same ingredients and/or materials; and/or ▪ Documentation of product specifications of input materials and output products.
Hazardous waste	Shall be defined in accordance with UAC R315-261-3.
Holding Time	The maximum time allowable between time of sampling and time of extraction and analysis, or both.
Incoming Load	Refers to a load when a waste shipment is received (as defined below) at CHGM through the time the waste shipment is rejected or accepted.

Term	Definition
Laboratory Manager	The individual or qualified designee responsible for implementation of the WAP and Supplemental WAP.
Macroencapsulation (40 C.F.R. § 268.45 – incorporated by reference in UAC R315-268-45)	A technology-based immobilization method for treating hazardous debris (MACRO), defined as "application of surface coating materials such as polymeric organics (e.g., resins and plastics) or use of a jacket of inert inorganic materials to substantially reduce surface exposure to potential leaching media." The performance standard requires that "encapsulating material must completely encapsulate debris and be resistant to degradation by the debris and its contaminants and materials into which it may come into contact after placement (leachate, other waste, microbes)."
Parameter	A specific material property, for example, pH, specific gravity, or viscosity.
PCB(s)	Polychlorinated biphenyls (PCB(s)) or PCB Item(s) as defined in 40 C.F.R. § 761.
PCB Waste	Any waste (e.g., mixture of liquid, solid, or sludge or any PCB-containing item) that contains PCBs regulated for disposal under 40 C.F.R. § 761.
Pre-acceptance	The period in which a waste stream's acceptability for storage and treatment at CHGM is evaluated. This is the same as the Profile Approval Period.
Precision	The agreement or repeatability of a set of replicate results among themselves or agreement among repeated observations made under the same conditions.
Profile	A detailed description of the waste or waste stream that the generator submits to the Clean Harbors Central Profiling Group (CPG) as part of the profiling process. The profile information includes analytical data along with a Clean Harbors Waste Material Profile Sheet (WMPS) or Waste Characterization Report (WCR). Both the CPG and CHGM review the profile information.
Radioactive	Any byproduct or source material licensable by the Utah Division of Waste Management and Radiation Control or the Nuclear Regulatory Commission, or any waste found to have a count rate as measured one inch from the surface that exceeds the background by three times or more.
RCRA hazardous waste	A waste considered hazardous as defined in UAC R315-261-3.
RCRA Empty	No more than 3% by weight of the total capacity of the container remains in the container if the container is less than or equal to 119 gallons in size; or no more than 0.3% by weight of the total capacity of the container remains in the container or inner liner if the container is greater than 119 gallons in size.
Receive or received	Waste is considered received when it passes into the fenced portion of CHGM.
Representative sample	A sample exhibiting average properties of the whole waste.
Screening Method	A semi-quantitative procedure for determination of the specific concentration, or characteristic of an analyte or analyte group.
Traceability	Laboratory documentation maintained at CHGM that allows a set of data to be traced from the analyst to the sampler and then to the waste itself.

Term	Definition
Unrestricted Waste	Waste that is not hazardous according to R315-261.
Waste Stream	A waste that is, or can be, identified as a line item on the Uniform Hazardous Waste Manifest from the same source of generation and delivered with the same load. Identical materials with the same waste profile number that are listed on separate manifest line items only because of container size or type are the same waste stream.
Waste Treatment Stream	Wastes that exhibit sufficiently similar characteristics that they could be placed together on the same line on the Uniform Hazardous Waste Manifest. For example, ash, slag, and baghouse dust from the Clean Harbors Aragonite incinerator.

1.2. FACILITY DESCRIPTION

CHGM is in a remote part of Tooele County, Utah that has been specially designated for waste disposal.

A variety of industries generate waste amenable for treatment, storage, and disposal at CHGM. Examples include:

- Aerospace
- Agriculture
- Asbestos Removal
- Automotive repair
- Automotive scrap recyclers
- Electronics
- Geothermal
- Governmental agencies
- Laboratories
- Machine shops
- Manufacturing
- Metal finishing and plating
- Military
- Mining
- Municipal wastewater treatment
- Small and very small quantity generators
- Service industries
- Site remediation activities
- Transportation
- Utilities
- Well drilling
- Oil extraction, refining, and processing
- Oil transportation
- Oil marketing

CHGM shall manage the following major waste types:

- Non-hazardous Industrial Waste – solid, sludge, or liquid non-hazardous industrial waste shall be stored, treated, and/or landfilled as required by the applicable regulation. Liquid waste shall be solidified prior to landfilling.
- RCRA Hazardous Waste as defined in UAC R315-260 through R315-261
- Wastes Regulated by TSCA regulations at 40 C.F.R. §761 and 40 C.F.R. §61 Subpart M (e.g., PCB waste and asbestos)
- Utah-specific regulated wastes as defined in R315-261-31 (nerve, military, and chemical agents (F999 and P999))
- The complete approved waste code list is in Appendix 2.

2.0 WASTE PRE-ACCEPTANCE PROCESS

2.1. WASTE PROFILE PREPARATION

The generator makes a waste determination and works with the Clean Harbors Central Profiling Group (CPG) to generate a Waste Material Profile Sheet (WMPS) (Exhibit 1).

The Waste Profile includes the following information from the Generator:

- Name
- Contact person
- Generating process
- DOT shipping name
- Chemical constituents (waste codes)
- Whether the waste is radioactive
- A certification form indicating whether the waste is subject to Land Disposal Restrictions (LDRs) in accordance with UAC R315-268
- Address
- EPA ID number
- Common name of the waste
- Hazardous class
- Chemical concentrations
- Whether the waste is infectious
- Whether the waste is subject to TSCA regulations.
- Signature (by the generator or representative)

Depending on the type of waste, the following information is also required:

- A representative sample and chain-of-custody.
    - Waste generators shall refer to UAC R315-261of for the appropriate sampling procedure.
    - A representative sample may not be required if CHGM determines that the pre-acceptance documentation provides sufficient information to maintain compliance with the permit and operational conditions, and if obtaining a sample would not aid in the disposal decision process.
- Additional analytical results, Safety Data Sheet(s) (SDS), manufacturer's technical fact sheets, product ingredient listings, etc.

- If the waste is in a lab pack, the generator shall describe the volume and the contents of the container(s). The generator of the lab pack shall supply the appropriate LDR notification/certification form.
- For hazardous waste to be treated in stabilization tanks and then placed in the landfill, the generator must certify that the waste at the point of generation does not contain greater than or equal to 500 parts per million weight (ppmw) volatile organic compounds (VOCs). The generator may use the WMPS to make this certification.
- For incinerator residue wastes from CHA that are to be treated and/or disposed of, CHGM may use the analysis of the waste sampled under the CHA WAP instead of conducting the analyses identified in Tables C-1 or C-2. A physical description shall be provided so that a visual inspection of the load can be made upon arrival.
- If the generator has certified that a RCRA listed waste meets the relevant LDR treatment standard for the constituents of concern, the generator must verify the certification by providing analytical results for that waste from a Utah Certified Laboratory.
- For TSCA regulated PCB wastes, the generator shall include a certification statement that the waste has not been deliberately diluted from an original PCB concentration of >50 ppm or deliberately mixed with soil to avoid the incineration requirements of 40 C.F.R. §761.60(a). The Generator shall also report the specific source of the waste, waste description, original PCB concentration, and other chemical constituents of the waste.

2.1.1. Analytical Parameters

CHGM shall sample RCRA characteristic (D codes) and listed (F, K, U and P codes) wastes on the initial load, and annually thereafter, to verify the analyses outlined in Table C-1 and the applicable parameters in Table C-2. If there is reason to believe that the characteristics of the waste have changed, then CHGM may be required to perform additional analyses listed in Table C-2. This shall ensure that the waste or treated waste complies with the applicable treatment standards set forth in UAC R315-268-40 through 49.

If CHGM is treating constituents of concern, the verification process will be completed on the treated waste as described in Section 9.0 of this attachment.

2.1.2. Waste Not Requiring Sampling and Analysis During the Profiling Process

The following wastes do not require sampling and analysis during the development of the waste profile:

- Lab Packs, which may include but are not limited to, discarded containers of laboratory chemicals, lab waste, lab equipment, lab clothing, debris from lab spills or clean up, and floor sweepings packed in accordance with UAC R315-264-316.
- RCRA Empty Containers.
- Contaminated trash and debris (i.e., contaminated paper, glass, wood, metal, rubber, plastic, cardboard, etc.).

- Single source emergency spill material from a known source.
- Commercial products or chemicals that are off specification, outdated, unused, contaminated, or banned. This includes products voluntarily removed from the marketplace by the manufacturer or distributor in response to allegations of adverse health effects associated with product use.
- Asbestos-Containing Waste.
- Beryllium-Containing Waste.
- Waste produced from the demolition, dismantling, or renovation of industrial process equipment or facilities. These may include equipment, crushed drums, disassembled tanks, large construction debris, concrete, wood, etc.
- Debris as defined by UAC R315-268-2(g). CHGM shall visually inspect these materials after receipt but before shipment acceptance to ensure that the waste meets the definition of debris.
- Controlled substances regulated by the federal government, including illegal drugs and/or materials from clandestine labs.
- Materials designated for storage only and subsequent shipment off-site/transfer to another facility.
- Waste that is visually identifiable through an inspection (e.g., cathode ray tubes, batteries, fluorescent light tubes, filters, and filter cartridges, wire, tubing, paper products, metal sheeting and parts, crushed glass, piping, etc.).
- Contaminated personal protective equipment (PPE) – This includes gloves, Tyveks, respirator cartridges, clothing, etc.
- PCB waste such as transformers, capacitors, PPE, wooden planks, concrete, asphalt, rags, empty containers, steel pieces, miscellaneous building debris, etc.
- On-site generated waste, unless otherwise required.
    - Site-generated wastes include rainwater from collection sumps, rainwater from wheel wash sumps, rainwater from trenches, spill clean-ups, and groundwater monitoring activities. These wastes shall be collected, solidified, and placed into RCRA landfills or sent to CHA for incineration.

2.2. WASTE PROFILE APPROVAL

The CPG reviews and approves the waste profile and makes an initial determination whether the waste profile is one that CHGM may accept.

Next, the CHGM Laboratory Manager evaluates the acceptability of each waste stream. The decision to accept or reject a profiled waste stream shall be based upon the following information:

- Waste profile information, analytical (physical and chemical) information, and LDR notification/certification information.

- Conditions or limitations of existing permit conditions and regulations.
- Capability to manage the waste in a safe and environmentally sound manner.
- CHGM management's technical experience and judgment. CHGM has the final say to accept the waste if the above is met.

Once CHGM has decided they can accept the waste, CHGM will officially accept the waste stream into the corporate WinWeb system.

2.2.1. Recertification of Profiles

Each year, generators are required to recertify that their waste profiles are accurate and complete. RCRA listed wastes for which the generator has certified that a particular chemical meets LDR standards shall be analyzed annually to verify the generator certification. Alternatively, the generator may provide laboratory analysis demonstrating that the waste constituent meets the LDR criteria.

In addition, the generator must recertify/reprofile their waste if:

- The process generating the waste has changed.
- CHGM has reason to suspect that the waste does not conform to the profile documentation.

CHGM is not required to recertify their profiles for site-generated wastes.

If a waste arrives at CHGM after the profile has expired but the profile was current when the generator shipped the material, then CHGM may accept the material without first obtaining a re-certification.

3.0 WASTE ACCEPTANCE PROCESS

3.1. WASTE RECEIVING PROCEDURES

Waste receiving procedures shall begin when a shipment of waste arrives at CHGM.

1. Upon arrival, CHGM shall weigh the truck.
2. The receiving staff shall review the manifests and accompanying paperwork for completeness.
   a. They will verify that the waste has an acceptable profile at CHGM.
   b. They will verify that the waste codes are listed with the information on the profile.
   c. They will ensure that wastes that are subject to the LDRs are accompanied by a form or document from the generator (or treater) notifying CHGM of the appropriate treatment standard and all applicable prohibitions. CHGM requires LDR forms with each waste shipment.
   d. If this review for completeness shows that information is needed (e.g., waste profile number, waste codes, LDR form, signatures, etc.), CHGM shall contact the generator.

e. If the generator cannot provide the necessary information, the load shall be rejected back to the generator.

Waste shipments that have been received at CHGM will not be accepted until such time that CHGM makes a final decision regarding waste acceptability.

3.1.1. Process for Waste that Arrives without an Approved Profile

If a waste shipment arrives at CHGM without an approved profile, CHGM may receive the waste. However, CHGM will not accept the waste until they contact the generator, the generator completes a profile, and the CPG and CHGM ascertain whether CHGM can accept the waste for management.

If such wastes arrive at CHGM, the transporter shall either retain custody of the waste or the wastes shall be placed into a permitted storage location based on its United States Department of Transportation (DOT) description while pre-acceptance procedures are completed, the waste profile is approved, and the waste is officially accepted. If the waste is placed into storage, the container will be clearly marked with the words "Awaiting Profile Approval."

If the generator cannot provide a WMPS in a paper or electronic format, does not have analytical results for the waste, or is not able to characterize the waste by process knowledge, one of the following will then occur:

- CHGM will reject the load back to the generator; or
- CHGM will sample the waste, submit the sample to a Utah Certified Laboratory for analysis, and evaluate the results.
- Based on the analytical results, CHGM will take one of the following actions:
  1. Reject the waste back to the generator;
  2. Reject the waste and send it to an appropriate TSDF; or
  3. Accept the waste for management at CHGM and record the waste profile information.

3.2. WASTE VERIFICATION - INSPECTIONS AND SAMPLING

When a shipment of hazardous and/or TSCA regulated waste arrives, CHGM will inspect, review the profile information, sample, and analyze the waste to:

1. Identify the chemical and physical waste characteristics of the waste shipment and compare the result to the profile information and manifest information; and
2. Ensure proper waste management and storage,
3. Ensure the proper treatment and/or disposal of the waste, including selection of the proper treatment recipes.

3.2.1. Visual Inspections

CHGM shall conduct visual inspections and sampling to verify that the waste conforms to the description in the waste profile. CHGM staff shall visually inspect and document all bulk loads and each container.

3.2.2. Sampling

CHGM shall sample all bulk waste loads except for large volumes of the same waste received from one source (e.g., contaminated soil from major remedial action). For these shipments, at least 10% of the loads shall be randomly selected, sampled, and analyzed according to Table C-6.

For a single waste stream shipped in multiple containers from a single generator, CHGM shall sample a minimum of 10% of the total number of containers in the shipment. For wastes in multiple containers with a count of less than ten, CHGM shall sample a minimum of one container.

Sample collection and analysis methods for incoming waste are discussed in sections 4.0 and 6.0.

3.2.3. Waste Verification Analysis (Fingerprinting)

At a minimum, the fingerprint analysis shall consist of the parameters listed in Table C-1 and where applicable, Table C-2. For TSCA regulated wastes, the fingerprint analysis will consist of the parameters listed in Table C-1 and where applicable, Tables C-2 and C-3. CHGM is not required to sample or analyze materials that are to be transferred off-site without treatment or processing. Fingerprint analysis is discussed in detail in Section 6.0.

3.2.4. Containers of Waste that are Not to Be Opened

CHGM is not required to open shipments of the waste types listed below due to their toxicity; however, the generator must furnish documentation and certification that the containers contain no free liquids and are at least 90% full.

- Nerve agent residues/wastes from military and chemical agents (e.g., F999 and P999 waste codes);
- Waste containing beryllium; and
- Any other waste deemed to pose a significant occupational hazard to CHGM employees due to its toxicity. Such wastes must have the appropriate approval from the Director or the EPA if they are TSCA regulated wastes.

3.2.5. Waste Not Requiring Sampling and Analysis During Waste Verification

CHGM is not required to sample and analyze the shipments or types of wastes listed in Section 2.1.2. In addition, CHGM is not required to sample and analyze the following:

- Waste from a remedial project (such as a CERCLA waste) in which the sampling and analysis plan was approved by a federal or state agency and the analysis was conducted by a Utah Certified Laboratory.

- Materials designated for storage and subsequent transfer to another facility. If it is determined that CHGM will process a waste previously designated for storage and transfer, CHGM shall sample and analyze that waste prior to any treatment or disposal activities.

In addition to these exceptions, CHGM may waive sampling and analysis where the pre-acceptance information is sufficient to ensure compliance with permit conditions and the operational constraints of the treatment process, and any one of the following conditions exist:

- Obtaining a sample poses an unnecessary risk of exposing CHGM employees to acutely or chronically hazardous carcinogenic, mutagenic, oncogenic, teratogenic, or sensitizing materials.
- CHGM cannot reasonably obtain a representative sample due to the nature of the material (for example filter cartridges, large pieces of contaminated concrete, metal, or wood, or other contaminated debris).

3.2.5.1. Samples Collected and Analyzed by the Generator

CHGM can use the analysis of a waste sample collected by a generator (or their designee) as a pre-acceptance sample and as the incoming load sample if all the conditions below are met:

1. The sample was collected in the presence of a CHGM employee.
2. The sample was sent to a Utah Certified Laboratory under chain-of-custody.
3. The sample has an approved profile issued by Clean Harbors.

If CHGM personnel collect the samples on behalf of the generator, they must follow this WAP.

3.2.5.2. Samples Taken at Aragonite or Clive

CHGM may use the analytical results for incoming load samples taken at CHA, Clive, or other Clean Harbors locations instead of sampling the incoming waste if all the conditions below are met:

1. The analytical results are from a Utah certified lab.
2. The analysis was performed using methods specified in this attachment.
3. The Clean Harbors facility that shipped the waste has reviewed the analyses prior to shipment.
4. CHGM has verified that the Clean Harbors facility that shipped the waste reviewed the analysis prior to shipment.

For example: CHA receives waste, fingerprints it, and ships it to CHGM for management. When the waste arrives at CHGM, they may accept it without taking additional incoming load samples provided that 1) the analytical results conform with the approved profile submitted by the generator, and 2) the CHGM laboratory manager approves the analytical results.

3.2.5.3. Wastes Generated at Aragonite

CHGM may use the analytical results from CHA for incinerator residue from their incinerator if CHGM has performed a visual verification that the waste matches the profile description for each load when it arrives at CHGM.

3.2.6. Decision to Require Additional Sample Analysis

CHGM may decide to require additional analysis based on the following:

- Profile information.
- Results of the fingerprint analysis.
- Knowledge of the generator and/or the waste generating process.
- Limits on targeted waste management units.
- Conditions and limitations of existing permits and regulations.
- Experience of facility management in determining the need to know more information.
- Any additional documentation obtained for the waste stream, including information that the waste is subject to the LDRs.

Table C-2 lists some of the additional analyses that may be required. CHGM shall document and maintain the results of the fingerprint analysis or waste verification analysis at CHGM either on paper or electronically.

3.3. Decision to Accept or Reject Waste

The CHGM Laboratory Manager shall review all the available information and decide whether to accept or reject the waste load. Waste verification analysis is not required for wastes that will be transferred to another TSDF. This decision shall be based on:

- Manifest information
- Load inspection
- Sample comparison, if applicable.
- Analytical results
- Profile documentation such as SDS, product ingredient(s), or pre-acceptance analysis.
- LDR notification/certification information
- CHGM management's judgment. CHGM has the final decision.

3.3.1. Discrepancy Policy

All acceptance criteria and laboratory control limits can be found in the associated standard operating procedures SOPs. CHGM keeps SOPs onsite and are listed in Table 10.1.

Discrepancies are defined by UAC R315-264-72. There are three basic types of discrepancies, variation in weight, piece count, or type. Discrepancies are as follows:

- For bulk waste (end dumps, roll-off bins, tank trucks, etc.), a discrepancy is when the actual weight of bulk shipments varies more than ± 10% of the weight shown on the manifest.
- For piece count (containers), a discrepancy is when the number of containers on the load does not match the number of containers listed on the manifest.
- For type (bulk and containerized waste), a discrepancy is when the fingerprint analysis as described in Table C-1 is not within the tolerance limits specified in Table C-4. Should a value or values fall outside of the specified tolerance limits, it shall be considered a load discrepancy and shall require further investigation and/or analyses to resolve it. CHGM may do one or more of the following to resolve the discrepancy:
  - Review the sampling and analytical data to verify that they are correct.
  - Conduct additional analyses to resolve the discrepancies or to re-profile the waste.
  - Contact the generator or authorized representative. In cases where the waste is eligible for storage or treatment, CHGM may store the waste while the discrepancy is resolved with the generator or authorized representative. This may involve creating a new profile for the waste or updating the existing profile.
- For lab packs, a discrepancy is when the number of containers listed does not match the manifest and/or the contents of the lab pack do not match load inventory sheet.
  - CHGM shall verify at least 10% of the lab packs for each manifest line and a minimum of one lab pack per manifest. CHGM shall reconcile discrepancies with the waste generator.
  - If CHGM documents a discrepancy, CHGM shall verify 100% of the lab packs from the load.
  - CHGM is not required to follow the verification procedure for lab packs generated on site.

CHGM can accept the waste if they resolve the discrepancy. CHGM shall clearly indicate the resolution of the discrepancy in the operating record. If the discrepancy is not resolved within 15 days, CHGM will provide written notification to the Director and EPA Region 8 for TSCA regulated wastes.

3.3.2. Rejection Policy

CHGM shall only accept incoming waste load(s) for treatment, storage, or disposal on condition that the manifest, load inspection, fingerprint analysis, and LDR forms are consistent with the profile.

CHGM shall consider incoming waste loads non-conforming and subject to further evaluation if:

- There is a difference between the quantity or type of waste designated on the manifest or shipping papers and the quantity or type of waste CHGM receives.

- The manifest contains other incorrect information.
- The load does not match the sample description, or the fingerprint results are not consistent with the results contained in the profile.
- The fingerprint test results are not consistent with the profile information and/or pre-evaluation test data.

If a waste load is non-conforming (Off-C), CHGM shall contact the generator and/or their designee as soon as practical to obtain additional information or to clarify information contained in supporting documentation (waste profile, manifest, and/or LDR notification/certification form). CHGM shall review the additional information and decide whether the non-conforming load is acceptable at CHGM. If it is, CHGM may amend the manifest at the direction of the generator or their designee. CHGM may either amend the profile or recharacterize the waste and create a new profile. CHGM may stage the load of waste in a permitted storage area at the facility while they work to rectify the problem with the non-conforming load.

If CHGM cannot accept the waste, they shall notify the generator. CHGM will reject the waste and return it to the generator or, with generator approval, manifest it off-site to an approved transfer, treatment, or disposal facility.

4.0 SAMPLING STRATEGIES AND FREQUENCY FOR INCOMING WASTE

The purpose of sampling and analysis is to ensure that the waste shipment matches the waste described on the accompanying manifest. CHGM shall select the appropriate representative sampling techniques, devices, and containers from the options presented in UAC R315-261 Appendix I. CHGM may accept and dispose of wastes that are restricted from land disposal at CHGM following the LDR rules.

CHGM shall collect representative samples using the relevant method outlined in:

- "Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods," SW 846, EPA.
- "Handbook for Sampling and Sample Preservation of Water and Wastewater," EPA-600/4-82-029.
- "Samplers and Sampling Procedures for Hazardous Waste Streams," EPA-600/2-80-018.
- UAC R315-261, Appendix I.

These sampling methods are employed for waste generated off-site and facility-generated waste. CHGM shall decide the sampling methods on both the nature of the waste and its location before sampling. In some instances, Clean Harbors personnel may sample the waste where it is generated. Samples may be collected at the Clive and CHA Facilities, and these sample results will be treated the same as any other analytical results that come to CHGM.

4.1. SAMPLING PERSONNEL

Trained personnel shall perform sampling. The CHGM Manager or a designee shall train sampling personnel and observe their sampling technique each month to ensure a thorough understanding of sample collection, storage, and transportation practices. CHGM shall incorporate the training provided to the sampling personnel into the operating record.

4.2. SAMPLE COLLECTION METHODS

CHGM shall collect waste samples according to the sampling protocols in the most current versions of EPA SW-846 and the American Society of Testing Materials (ASTM) standards (See Tables C-4 and C-5). The methods and equipment used for sampling waste materials may vary with the form and consistency of the waste materials to be sampled.

4.2.1. Sample Labels

CHGM shall use sample labels to identify samples. CHGM shall affix the labels to the containers prior to or at the time of sampling. CHGM shall include the following information on the labels:

- Sample identification,
- Place of collection,
- Date of collection,
- Name of person sampling, and
- Manifest number and generator name or load number, if applicable.

4.2.2. Sampling Small Containers

The term "small container" refers to receptacles (e.g., drums) designed for transporting materials on flat beds or vans and that are small enough to store in the container management facility (as opposed to bulk transport containers or stationary tanks).

COLIWASAs, triers, dip tubes, thiefs, weighted bottles, bomb samplers, or other appropriate sampling shall be used to sample containers.

For shipments of a single waste stream from the same generator, CHGM shall sample 10% of the containers (rounding to the next whole number). Samples of containers with similar physical appearance can be composited. Samples of dissimilar physical appearance cannot be composited.

Prior to treating or disposing of all the containers from a waste stream, CHGM shall open them all and compare their physical appearance to the containers that were sampled. If the waste does not appear to conform to those sampled, CHGM shall collect additional samples from the containers with non-conforming appearance.

For liquid wastes (or liquids with precipitated solids), the sampler shall use a COLIWASA or equivalent. CHGM shall take samples from locations dispersed

vertically and horizontally throughout the waste. CHGM shall insert the sampling device into the container from the top and push it down slowly until it reaches the bottom of the container. CHGM shall seal the device to retain the contents. CHGM shall transfer the contents of the sampling device to an appropriately labeled sample container. Alternatively, the sampling device may be stoppered at both ends, wiped dry with a disposable cloth, and then taken to the lab for analysis.

For solid containerized wastes, CHGM shall use a trier, thief, shovel, or scoop to collect the sample. The sampler shall collect a sample that uniformly represents the waste composition of the container (i.e., all layers and phases shall be represented in the sample). If the contents are solidified, such as concrete, clay, polymerized material, or glue, CHGM shall collect a sample from the top of the container.

4.2.3. Sampling Liquid Tanks

Typically, liquid tanks are sampled from the outlet valve or piping. The sampler will flush the valve prior to drawing a sample. The sampler shall place the liquid accumulated from the flushing process in a bucket and return it to the tank. Other equipment may be used that allows for sampling at different depths, such as weighted bottles or bomb samplers.

CHGM shall sample vacuum or tank type trailers through one of the top ports. If a vacuum truck is compartmentalized, CHGM shall sample each compartment. For wastes that must not be sampled through the top port, CHGM may collect the sample from a valve in accordance with the SOP. For example, a vacuum trailer containing a load of waste with a suspected pH of less than 3 may be sampled through the valve on the tanker to protect the sampler and the operator from potential exposure to hazardous fumes.

CHGM shall sample tank sediments from the bottom valve when the material cannot be sampled by other means.

4.2.4. Sampling Bulk Containers

Bulk containers are typically rolloff boxes, dump trucks, tank trucks, rail tank cars, or rail gondola cars. Where sampling of bulk loads is required, CHGM shall sample each container of each load as described below.

Bulk solids in rolloff boxes, dump trucks, or truck and pups shall be sampled at two locations in the container(s). CHGM shall use a trier, thief, auger, or shovel at each location to draw a sample from at least one foot in depth or the full depth of the waste, whichever is less. CHGM shall composite the samples so that one sample serves as the incoming load sample representing all the waste in the bulk container.

Bulk solids in rail gondola cars shall be sampled at four distinct locations in the container. At each location, a trier, thief, auger, or shovel shall be used to draw a sample from at least one foot in depth or the full depth of the waste, whichever is less. The samples shall be composited so that one sample represents all the waste in the bulk container. This sample shall be used as the incoming load

sample that represents all rolloff boxes or dump trucks filled from that gondola car. However, CHGM shall visually inspect each incoming load from that car to ensure visual conformance with the incoming load sample. A visual non-conformance will require CHGM to resolve the discrepancy.

Each compartment of a tanker truck shall be sampled when it contains bulk liquids or sludges. Bulk liquids are sampled using a COLIWASA or similar device that can sample vertical anomalies. Bulk sludges shall be sampled with a device appropriate for the consistency of the material such as a COLIWASA, trier, dip tube, thief, weighted bottle, or bomb sampler. Samples collected from multiple compartments that contain waste from the same generator and waste stream may be composited prior to analysis only if there is no difference in physical appearance.

Tank trucks without access ports shall be sampled through the valve. The sampler will flush the valve prior to drawing the sample. The flushed material shall be managed with the waste.

An exception may be made to the requirement to sample each load of bulk waste shipments when multiple bulk loads of a single waste stream are received from a single source (e.g., a major site clean-up of contaminated material or a large volume over a short time). In such cases, CHGM shall sample the first load of the day (and then the 11th, 21st, etc.) and analyze for the incoming load parameters. CHGM shall inspect all loads for physical appearance. A visual non-conformance will require CHGM to resolve the discrepancy.

4.2.5. Frozen Waste

Loads may arrive at temperatures that prevent collection of a representative sample. Under such circumstances, the waste will be allowed to warm until samples can be collected and analyzed. Sampling can occur at any temperature, provided that a representative sample can be obtained. Alternatively, and if conditions warrant (e.g., freezing conditions), a sample of PCB waste being delivered to CHGM may be obtained at the point of generation to satisfy the requirements of this attachment. Upon arrival, CHGM shall visually inspect the load for free liquids.

4.3. TRACEABILITY

CHGM shall maintain sample traceability for all internal sampling and analysis and for samples that are shipped to Utah Certified Laboratories. This includes using numbered and cross-referenced notebooks to document waste receiving and screening procedures. CHGM shall give all samples a unique identification number to facilitate this process. See the Quality Assurance Plan (Attachment II-RCRA-TSCA WAP, Appendix 1) Sections 5.2 & 5.4 for the requirements for seals and/or chain-of-custody.

4.4. SAMPLE PRESERVATION

All samples shall be preserved in accordance with the analytical method requirements for the parameter to be measured (Quality Assurance Plan Table 4.1). Hazardous waste samples do not require preservation but are subject to holding times.

4.5. SAMPLE DISPOSAL

CHGM shall dispose of samples of waste streams in the same fashion as the waste stream itself. Samples approved for the same management processes may be consolidated in containers. Samples of waste that was deemed unacceptable for management on-site may be returned to the generator (or representative) or sent to an approved facility for disposal.

4.6. SAMPLING APPARATUS CLEANING

Sampling tools shall be kept clean to prevent interference with future analyses. Sample apparatus used for screening shall be kept free of loose material that could enter the sample. Visually clean or new sampling equipment shall be required where the sampling is being performed to determine constituents in the parts per million range.

5.0 ANALYTICAL PARAMETERS AND TEST METHODS FOR WASTE VERIFICATION

CHGM has established procedures to identify waste and to collect the information required to manage waste properly and safely. Some procedures are industry standard methods, and some have been developed by CHGM through operating experience (Table 10.1 – Laboratory Standard Operating Procedures). The purpose of each screen is to determine proper waste management procedures and conformance with waste profiles. Screening results that do not match waste profiles or manifests require CHGM to investigate further (Section 3.3). Analyses are classified as either mandatory or supplemental/discretionary.

5.1. MANDATORY ANALYSIS

All incoming waste identification samples are subjected to the mandatory analyses listed in Table C-1 and briefly described below.

5.1.1. Physical Description

Physical Description is used to determine the general physical properties of the waste and compare it to prior waste descriptions or samples. It includes physical state, layering, color, viscosity, turbidity, the presence of free liquids, and any other observable attributes.

5.1.2. Specific Gravity

Specific gravity is the density of a liquid compared to the density of an equal volume of water at a specified temperature.

5.1.3. pH Screen

The pH is measured to determine the corrosivity of the waste. pH may not apply to certain waste types, for example, organic wastes or wastes that are not water soluble.

5.1.4. Water Reactivity Screen/Determination of Water Compatibility

Water reactivity is measured to determine whether the waste has the potential to react vigorously with water to form gases or other products, or to generate extreme heat. This screen also determines the water solubility. This test does not apply to wastes that are already in contact with excess water or to wastes that are known to be water reactive.

5.1.5. Reactive Sulfides Screen

The reactive sulfides screen is performed on wastewaters with a pH greater than 6 and other wastes that are to be treated in a process unit. This screen indicates whether the waste produces hydrogen sulfide upon acidification below pH 2.

5.1.6. Combustible Vapor Test (PID, FID)

This method is used to determine the presence of volatile organic compounds dissipating from a waste. A reading of greater than 200 ppm on the instrument (Flame Ionization Detector (FID), Photoionization Detector (PID), and/or Catalytic Combustible gas and vapor sensing instrument or equivalent) requires that a flash point analysis be performed to test for ignitability if the material is destined for direct land disposal. A reading of < 500 ppm on the instrument (FID, PID and or Catalytic Combustible gas and vapor sensing instrument or equivalent) is required if the material is destined for storage or treatment in tanks.

5.1.7. Ignitability Screen for Liquids

The ignitability screen indicates the fire-producing potential of the waste. This test is used to identify any obvious difference in waste type. This test is not performed on solids unless the waste contains free liquids as defined in UAC R315-260-10. This is a flash/no flash method and results are recorded as positive or negative.

5.1.8. Ignitability Screen for Liquids, Solids, and Sludges

The Setaflash and Pensky Martens methods are flash/no flash screening tests suitable for liquids, solids, highly viscous liquids, and sludges. The results shall be recorded as positive or negative.

5.1.9. Reactive Cyanides Screen

Cyanides Screening is performed on wastewaters with a pH greater than 6 and other wastes which are to be treated in a process unit. This screen indicates whether the waste produces hydrogen cyanide upon acidification below pH 2.0.

5.1.10. Oxidizer Screen

The oxidizer screen qualitatively determines whether a waste is an oxidizer and shall only be performed on wastes with pH greater than 2.0.

5.1.11. Radioactivity Screen

All incoming waste shipments shall be monitored for radioactivity using a count rate meter with a Geiger-Mueller detector or equivalent.

5.1.12. Halogenated Organic Compounds Screen

CHGM screens waste that will be land-disposed for halogenated organic compounds (HOCs), which may be incompatible with the landfill liners. If the screen shows HOC concentrations above 1000 ppm or equivalent TCLP levels, CHGM shall treat the waste or send it to another facility for appropriate treatment and disposal. HOCs of concern are listed in Appendix 3.

5.2. SUPPLEMENTAL DISCRETIONARY ANALYSES

Supplemental discretionary analyses are listed in Table C-2. Facility management may select additional supplemental analyses to obtain information required for efficient process control or to further evaluate a positive result from a mandatory screening test. For example, additional flash point testing may be run to provide more specific waste data when a positive flammability potential is reported during the mandatory analysis.

5.3. REFERENCES FOR TEST METHODS

Analytical parameters and associated test methods are listed in Table C-5. The laboratory at CHGM is a Utah Certified Laboratory and is authorized to use these methods and method updates/improvements. CHGM uses the following test method references:

- Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Edition, US EPA, 1986 and its updates.
- American Society for Testing and Materials (ASTM)
- EPA 600/4-79-020, Methods for Chemical Analysis of Water and Wastes
- Standard Methods for Examination of Water and Wastewater, Latest Edition
- EPA 40 C.F.R., 136, App. A Methods
- EPA Contract Laboratory Program, Inorganic SOW and Organic SOW Methods.
- Clean Harbors approved test methods (Table 10.1 – Laboratory Standard Operating Procedures).

6.0 WASTES THAT MAY BE DISPOSED DIRECTLY IN THE LANDFILL

CHGM may accept liquid and solid waste streams that are non-hazardous and meet LDRs.

6.1. VISUAL INSPECTION FOR FREE LIQUIDS

CHGM shall inspect all containers in the Container Management Building for the presence of free liquids prior to being sent for landfilling. A waste stream is considered without free liquids if the pre-acceptance description was "non-liquid," and the incoming load inspection confirmed the description. All storage containers (e.g., shipping containers, overpack containers, etc.) that contain free liquids shall be either solidified or decanted to remove the free liquids.

Lab packs and items that are excluded by the Permit or Director authorization are exempted from the free liquid visual inspection. Generators of these waste streams must certify that:

1. The waste does not contain free liquids, and
2. The container(s) holding the waste is/are at least 90% full.
3. Photo documentation is a mandatory part of the certification.

7.0 WASTE TREATMENT PROCESSES

CHGM's waste treatment processes include solidification, stabilization, oxidation/reduction, and/or debris treatment (microencapsulation/macroencapsulation). CHGM will treat RCRA hazardous waste that contains multiple treatment standards for constituents of concern to the most stringent regulatory or statutory treatment standard. Dilution as a substitute for treatment is prohibited (UAC R315-268-3). The following describes the treatment processes.

7.1. SOLIDIFICATION

Solidification is for waste containing free liquids. Pozzolanic and other appropriate materials are used to chemically fix the liquid. This process may also be used to neutralize a waste stream and meet the LDR technology standard of neutralizing and deactivating.

Pre-treatment analyses of the wastes are required to determine compatibility with the pozzolanic reactant. The analyses shall include the initial analysis, fingerprint analysis, and compatibility testing done prior to treatment. In-process analyses are not required for this treatment. Post-treatment analysis using a paint filter test is required to assure that all free liquids have been chemically reacted and the mixture is suitable for disposal in the landfill.

7.2. STABILIZATION / OXIDATION / REDUCTION

CHGM uses treatment "recipes." Recipes are developed using treatability studies and are based on the chemical constituents in the waste. They describe the type and quantity of solidification and stabilization reagents needed to treat the waste to meet LDR requirements. Reagents may alter the chemistry of the waste by converting the constituents of concern to insoluble salts, chemically bonding the constituents to an insoluble matrix, oxidizing them, reducing them, adjusting their pH, or buffering them.

CHGM may vary the quantity of reagent used to allow for variation in the moisture/liquid content of the waste. However, this variation may not deviate from the prescribed quantity in the recipe by more than 25%. The exceptions to this are water and cement kiln dust. Cement kiln dust can vary significantly in its effectiveness. CHGM shall record in the operating record the treatment recipes and the actual amounts of material and reagent used to treat the waste.

Technology standards that CHGM achieves through the stabilization process are:

- Chemically "fixing" inorganic metal component(s) in the waste. This is done by converting the more soluble metal compounds to less soluble compounds and/or combining the metal compounds with reagents that physically bind them. Depending on the waste stream and its constituents, oxidation and/or reduction reactions may also be required as part of the fixing process to meet the concentration-based stabilization standard.
- Chemically oxidizing or reducing a waste stream shall be required to reduce total and/or amenable cyanides or sulfides in a waste to below LDR concentration standards.
- Chemically oxidizing a waste stream to achieve the LDR treatment technology standard of "CHOXD" and/or "DEACT."
- Chemically reducing a waste stream to achieve the LDR treatment technology standard of "CHRED."
- Neutralizing a waste stream to meet the LDR treatment technology standard of "NEUTR."
- Macroencapsulation, microencapsulation, or sealing shall be used to treat hazardous debris (UAC R315-268-45 Table 1).
- Physical sizing of waste, as necessary, is allowed to facilitate stabilization treatment.

7.3. TREATMENT OF HAZARDOUS DEBRIS

CHGM may utilize the following Alternative Treatment Standards for Hazardous Debris contained in R315-268-45:

- Any of the physical extraction technologies listed in UAC R315-268-45, Table I, A.1.a through e. Documentation shall be available in the operating record and upon request.
- Any of the immobilization technologies listed in UAC R315-268-45, Table I, C.1., 2., and/or 3.
- For PCBs, any self-implementing treatment authorized in 40 C.F.R. § 761.79 Decontamination Standards and Procedures may be used to decontaminate RCRA wastes containing PCBs or materials containing PCBs.

7.3.1. Macroencapsulation

CHGM is permitted to entomb the hazardous debris in a macroencapsulation vault (macro vault) or to cover it with a high-density polyethylene (HDPE) inert

jacket. Macroencapsulation is a technology-based standard, so no sampling and analysis are required on wastes that meet the definition of hazardous debris.

7.3.1.1. Macroencapsulation in a Vault

A macro vault can be a container, assembled concrete forms, or a pit in the landfill cell. The vault is prepared in the cell, and wood blocks or other inert materials are placed in the vault to prevent the hazardous debris from contacting the bottom. Alternatively, a layer of concrete may be placed in the vault and allowed to begin to cure.

The hazardous debris is loaded into the vault. Flowable pozzolanic material is added to the vault to fill in the void spaces in the waste. Lack of void space is important to maintain structural integrity of the waste and the vault. Waste shall not protrude through the surface of the macro vault. The encapsulating material shall have long-term integrity such that potential leaching media within a hazardous waste cell would not cause it to deteriorate.

A macroencapsulated waste shall have the encapsulating material present and apparent upon surficial visual inspection at the point of disposal. A minimum exterior coating of one inch is required. Corrective action is required for any macro vault that is found to lack structural integrity prior to disposal in a lift.

7.3.1.2. Macroencapsulation with Inert Jacket

CHGM's inert jacket macroencapsulation method requires that a minimum 40-mil high density polyethylene geomembrane liner be welded around the debris. Inert jackets will typically be used on pipe and large manufactured items around which a jacket can be custom fitted. The encapsulation process can be completed off-site or at the CHGM facility, only if a CHGM representative has inspected the waste to ensure:

- That the waste is consistent with the profile description.
- That there are no free liquids in the waste.
- That void space shall be minimized within the inert jacket.

As an alternative to an inspection by CHGM, the generator of the waste shall certify that the above criteria have been met. CHGM shall incorporate the certification into the operating record.

7.4. Storage of Treated Wastes

CHGM can place treated wastes into a container or onto a liner within a hazardous waste landfill cell ("put pile") for no more than six months while awaiting verification analyses. The liner shall be visible on all sides of the waste to prevent commingling with the waste in the landfill and other put piles. CHGM shall label such waste with a tracking number and locate it to allow its complete retrieval should the analytical results indicate that it does not meet the LDR standards. Waste composing a put pile shall be disposed of within one year of receipt at CHGM. No more than 250 put piles can be in existence at one time.

8.0 LDR VERIFICATION PROCESS FOR TREATED WASTES

8.1. POST TREATMENT SAMPLING OF WASTE TREATED IN STABILIZATION TANKS

Grab samples will be collected from the treated waste batch based on the assumption that the waste/reagent mix is homogenous. CHGM shall follow the sampling and analysis requirements in R315-268-40(b). Any grab sample shall comply with treatment standards before the waste is disposed of.

Grab samples shall be collected using a scoop, shovel, bottle, cup, or similar device. The sample will be placed in a labeled container that is appropriate for the type of analysis.

8.1.1. Initial Sampling

One grab sample shall be collected from each batch of treated waste. It shall be collected from the tank after treatment is completed, during removal from the tank, from the transport vehicle used to move the waste to the staging location, or immediately after the waste is staged.

8.1.2. Re-Sampling

Waste that does not meet the LDR standards shall either be resampled or retreated immediately. Resamples shall consist of two grab samples per batch of material to verify the results of the initial sample. If one or both resamples fail, the waste shall be retreated. If both pass, CHGM will determine that the waste meets treatment standards and will release the waste for disposal.

CHGM may also decide to retreat the waste immediately without re-sampling to verify the initial result. The re-treated waste must be sampled and analyzed to verify that it meets the LDR standards.

8.2. ANALYSIS OF TREATED WASTE

A Utah Certified Laboratory shall perform the analysis of the treated waste. The treated waste shall be analyzed for all LDR constituents with numeric standards and underlying hazardous constituents (UHCs) as appropriate for the waste codes in the waste that did not meet treatment standards prior to treatment.

8.2.1. Frequency and Scope of Testing

CHGM shall use either Option A or Option B when testing wastes with numeric LDR standards that are destined for land disposal.

8.2.1.1. <u>Option A</u>

CHGM shall sample and have a Utah Certified Laboratory analyze every treated waste batch selected for this option. The resulting analytical data shall demonstrate that the treated waste meets all applicable treatment standards specified in R315-268 prior to disposal in the landfill.

8.2.1.2. Option B

CHGM is not required to sample and analyze every batch of treated waste if the conditions below are met. This is referred to as tiered testing. Tiered testing shall be allowed based on documented statistical confidence in the uniform effectiveness of a treatment recipe for a specific waste stream that has consistent chemical and physical properties. For example, ash, slag, and baghouse dust waste streams from CHA.

If there is a failure in meeting the LDR treatment standards (UAC R315-268) at any time, CHGM shall return to the previous tier in the sequence for all subsequent loads of the same waste stream (Figure 9-1). For example:

- If the waste is subject to Tier 2 testing – return to Tier 1.
- If the waste is subject to Tier 3 testing – return to Tier 3a.

Waste that has already been disposed of in the landfill is not affected by returning to Tier 1 or Tier 3a.

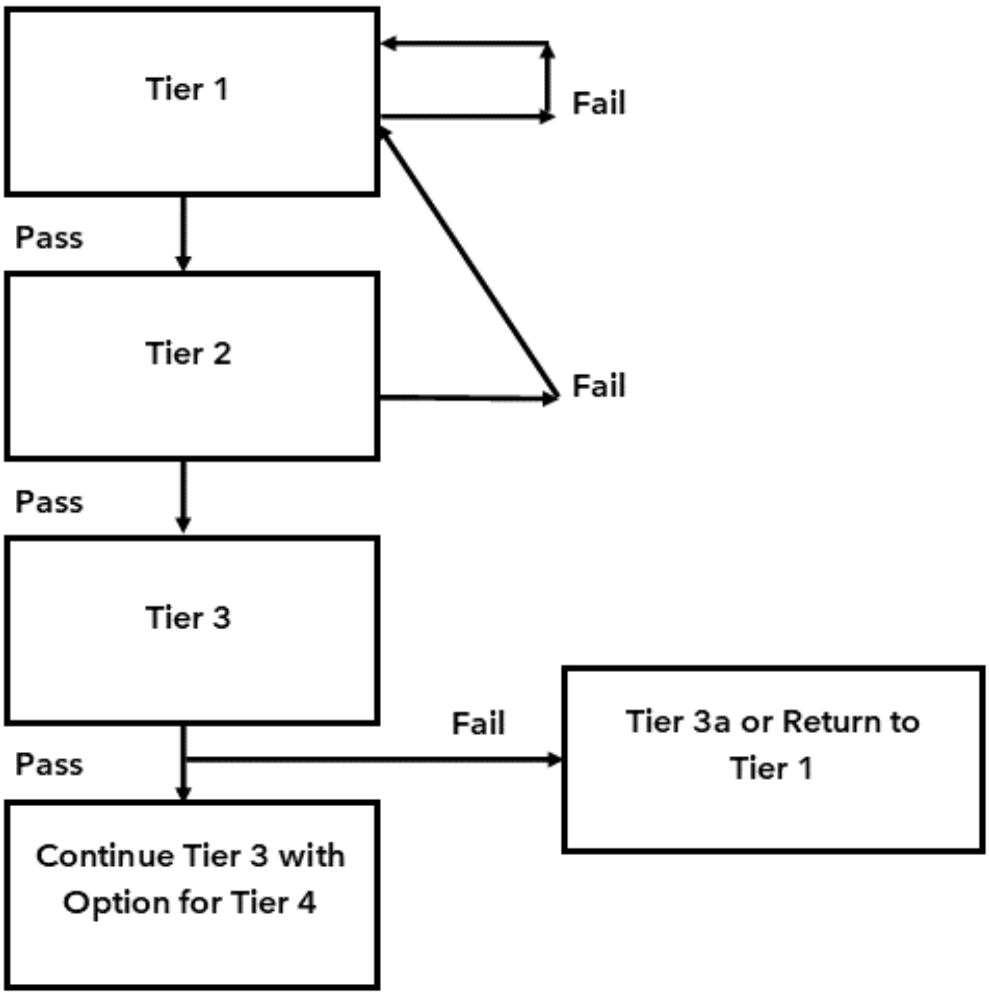

Figure 8-1. Option B Tier Testing Block Flow Diagram

A. Tier 1 Treatment Verification

Tier 1 begins with sampling and analyzing each batch of a waste treatment stream treated with the same recipe. The resulting analytical data must demonstrate that the treated wastes meet all applicable LDR treatment standards prior to land disposal. If the test results from the treatment of nine successive waste treatment stream batches demonstrate that all nine batches of treated waste meet treatment standards, CHGM shall be allowed to advance to Tier 2.

CHGM shall not proceed to Tier 2 until the analytical results of all nine batches are verified and determined to have met the LDR standards. Further, loads of the same waste stream that arrive at CHGM shall be subject to Tier 1 treatment verification until the analytical results of all nine batches are verified and determined to have met the LDR standards. If CHGM has verified 20 consecutive batches of the same waste stream treated with the same recipe, they can omit Tier 2 and go to Tier 3.

B. Tier 2 Treatment Verification

Tier 2 shall begin with sampling and analyzing the 10^{th} load. The analytical data from the 10^{th} load must demonstrate that the treated wastes meet all applicable LDR treatment standards prior to land disposal. If the next four batches of the same waste treatment stream are treated with the same recipe, they can be land-disposed of without testing. The 15^{th} batch shall be sampled and analyzed using applicable test method(s). The resulting analytical data from the 15^{th} batch must demonstrate that the treated wastes meet the LDR standards prior to land disposal. The next four batches of the same waste treatment stream that are treated with the same recipe can be land-disposed without further testing. CHGM then has the option to proceed to Tier 3.

CHGM shall not proceed to Tier 3 until the analytical results of the 15^{th} batch are verified and determined to have met the LDR standards. Further, loads of the same waste stream that arrive at CHGM shall be subject to Tier 2 treatment verification until the analytical results of the 15^{th} batch are verified and determined to have met the LDR standards.

If the analytical results indicate that any load analyzed during Tier 2 treatment verification failed to meet the standards, CHGM shall resume Tier 1 testing, starting at sample one as indicated on Table C-6.

C. Tier 3 Treatment Verification

Tier 3 shall begin with sampling and analyzing the 20^{th} load. The analytical data from the 20^{th} load must demonstrate that the treated wastes meet all applicable LDR treatment standards prior to land disposal. If the next nine batches of the same waste treatment stream are treated with the same recipe, they can be land-disposed without testing. The 30^{th} batch shall be sampled and analyzed using applicable test method(s). The resulting analytical data

from the 30th batch must demonstrate that the treated wastes meet LDR standards prior to land disposal. The next nine batches of the same waste treatment stream that have been treated with the same recipe can be land-disposed without further testing.

If the analytical results indicate that any load analyzed during Tier 3 testing failed to meet the standards, CHGM shall, at a minimum, proceed to Tier 3a treatment verification on the next load of the same waste stream that arrives at CHGM. CHGM has the option to return to Tier 1 treatment verification procedures in the event of a failure during Tier 3 treatment verification.

D. Tier 3a Treatment Verification

Tier 3a treatment verification is an option if a sample analyzed during Tier 3 treatment verification fails to meet the standards. Tier 3a shall require that five consecutive batches be sampled and analyzed. If all five consecutive samples meet the LDR treatment standards, CHGM may return to Tier 3 treatment verification.

E. Tier 4 Treatment Verification

If CHGM can demonstrate that a uniform and homogeneous waste treatment stream is adequately treated by an established recipe on a consistent basis, they may petition the Director to further reduce the post treatment verification analysis beyond that of Tier 3. This would entail a Class 1 permit modification requiring prior Director approval. CHGM would need to submit a combination of laboratory post treatment analysis and batch testing to demonstrate to the Director that the waste is consistent and uniform. Typically, a Tier 4 request will allow a reduction of sampling and analysis to one batch in every 20, although further reductions may be considered and approved by the Director.

9.0 QUALITY ASSURANCE/QUALITY CONTROL

A Quality Assurance Plan (QAP) for required waste analysis is included as Appendix 1 of this WAP. The QAP describes the methods and procedures that laboratory personnel use to assure that the analytical data they collect are technically sound, statistically valid, and properly documented.

This WAP is supported by Standard Operating Procedures (SOPs) that provide instructions for the required sample analysis. The SOPs are listed in Table 10.1 and are incorporated by reference as part of this WAP. They are required to obtain Utah certification of the laboratory and must be followed to comply with the permit.

Table 10.1. Lab Standard Operating Procedures.

SOP Number	Description
GM-13.03	Determination of Apparent Specific Gravity
GM-14.03	Recording Physical Description of Waste
GM-015.03	Screening Waste for the Presence of Oxidizers
GM-017.03	Determination of Water Compatibility
GM-024.05	Screening Waste Materials for Cyanide using Cyantesmo Paper
GM-027.02	Reactive Cyanides and Reactive Sulfides Screen
GM-029.00	Volatile Organic Compounds Screen by Photo Ionizing Detector
GM-031.02	Waste Sampling
GM-033.06	Determination of Waste pH
GM-037.03	Radioactivity Screen
GM-080.02	Screening Waste Materials for Reactive Sulfides using Lead Acetate Test Paper Strips
GMFP01	Pensky Martens Ignitability
GM-M001.08	pH Determination of Aqueous Liquids
SK-22A/B	HOC Screen with Electron Capture Detector or Electrometric Detection

10.0 RECORDKEEPING

Record (Logbook, Unload Work Order, or Equivalent)

All information pertinent to field surveys or sampling shall be recorded and incorporated into the operating record. Sufficient information shall be recorded to allow someone to reconstruct the sampling without reliance on the collector's memory. This record shall include, at a minimum, the following information:

- Location of sampling point
- Volume of samples taken
- Date of collection
- Sample identification number
- The name of the person sampling
- Comments or observations
- Sampling methodology
- Copy of the analytical results, if applicable

10.1. RECORD KEEPING FOR WASTE CODES

CHGM shall review waste codes and profiles for all waste streams that are sent to CHGM for storage and/or treatment. When waste arrives at CHGM, staff shall compare accompanying paperwork to the profile to assure that the codes match the profiles, LDR forms are completed, applicable LDR standards are met, and that the waste codes are those that CHGM can manage.

Most waste arrives at CHGM in discrete containers, and much of it meets LDR treatment standards upon arrival. Beyond profiling and receiving procedures, CHGM is not required to track waste codes for those wastes that already meet treatment standards. If, however, the waste needs to be treated prior to disposal, CHGM shall track waste codes in the cumulative treatment and storage vessels to ensure that all standards are met.

10.1.1. Leachate Storage Tanks

These tanks exclusively store leachate from the RCRA landfills. Other < 500 ppmw VOC water may be stored in these tanks with waste codes other than that for leachate. If that occurs, waste codes shall be tracked for those tanks.

10.1.2. Stabilization Tanks

These tanks shall be used only for treating waste and may contain different waste codes simultaneously. Each time the tank is emptied, all material is removed that can be removed with the trackhoe or equivalent. No waste code tracking shall be required unless multiples waste streams with different waste codes are being treated at the same time.

If the vessel is used for TSCA/RCRA waste, the vessels shall accumulate the TSCA /RCRA codes until either emptied by triple-rinsing (RCRA) or rinsed with a suitable solvent (TSCA). The third and final rinsate shall be tested and confirmed to be < 2 ppm PCBs to be considered clean to comply with TSCA. Alternatively, the surfaces shall be wipe sampled and confirmed to be < 10 ug/100 cm^2 PCBs to be considered clean.

10.1.3. Waste Code Tracking Procedure

When a new batch of compatible waste is added to the tank, the waste codes associated with this new waste shall be added to those waste codes already associated with the tank. This information shall be recorded in the documentation for the treated waste streams and will be kept in the operating record.

The tank may accumulate the same or compatible waste codes until the waste is removed (the vessel is emptied) or all waste codes that CHGM can accept for disposal are associated with that vessel. For RCRA only waste streams, the stabilization tanks will be considered empty when all the waste has been removed by normal means (e.g., the trackhoe). Once the vessel is emptied no waste codes remain in that vessel.

If batches with different waste codes are mixed, the LDR standards for all the waste codes in the batch shall be met prior to disposal.

10.1.4. Waste Code Record Keeping for Disposed Waste

CHGM shall comply with UAC R315-264-309 by maintaining the following information in the operating record:

1. A map with the exact location and dimensions, including the depth, of each cell with respect to permanently surveyed benchmarks.
2. A description and the quantity of each hazardous waste received (including manifest number) and the methods and dates of treatment and disposal.
3. The contents of each cell and the grid location of each waste disposed of at CHGM.
4. Other maps, diagrams, or tabulated supporting data may also be kept in the operating record.

11.0 SAMPLING AND ANALYSIS FOR ON-SITE GENERATED WASTE

Verification sampling is not required for on-site generated waste if it is managed as hazardous waste. Site-generated wastes include rainwater from collection sumps, rainwater from wheel wash collection tanks, rainwater from trenches, and spill clean-ups.

CHGM has determined that it meets the exemption to the air emission standards under UAC R315-264-1080 through 1091. Routine sampling and analysis of leachate and of the water from all wheel wash collection tanks is required to document the applicability of that exemption. The following sampling and analysis procedure shall be used.

11.1. LEACHATE FROM RCRA LEACHATE COLLECTION SYSTEMS

11.1.1. Frequency

The leachate from each active cell shall be analyzed during the 4th quarter to confirm that the Volatile Organics (VO) concentration in the leachate is < 500 ppmw.

11.1.2. Collection and Sampling of Leachate from Each RCRA Cell

For each RCRA cell, an equal amount of leachate shall be pumped from each active leachate sump (all risers) into the portable leachate collection tank. A sample from the portable leachate collection tank shall be collected using a COLIWASA tube. The leachate collection tank shall be emptied prior to sampling the following cell. Chain-of-custody procedures shall be used to send the sample to a Utah Certified Laboratory for analysis.

11.1.3. Analysis

The waste shall be analyzed in accordance with R315-268-1080 through 1091. The concentration of VO in the leachate must be < 500 ppmw for CHGM to maintain the exemption.

11.2. WATER FROM WHEEL WASH COLLECTION TANKS

11.2.1. Frequency

Water from the wheel wash tank(s) shall be analyzed annually to confirm that the VO concentration in the water is < 500 ppm.

11.2.2. Collection and Sampling of Wheel Wash Water

Prior to emptying the wheel wash tank(s), samples shall be collected, and chain-of-custody procedures shall be used to send the sample(s) to a Utah Certified Laboratory for analysis.

11.2.3. Analysis

The waste shall be analyzed in accordance with R315-268-1080 through 1091. The concentration of VO in the leachate must be < 500 ppmw for CHGM to maintain the exemption.

12.0 SAMPLING AND ANALYSIS OF THE SURFACE IMPOUNDMENTS

CHGM may place specific site generated wastes and non-hazardous liquid waste from off-site in the surface impoundment(s) as described in Permit Conditions V.B.1 and V.B.2. Waste must meet LDR standards prior to placement in the surface impoundment (Condition V.D.3). Condition V.D.4. requires CHGM to sample and analyze liquids and solids in the surface impoundment at least annually. The sample collection process is as follows:

12.1. LIQUID PHASE

Enough samples shall be collected from the surface impoundment to adequately represent the waste characteristics. At a minimum, three samples shall be collected, one from near the bottom and one from at least two sides of the impoundment. Additional samples may be needed depending on the volume of the waste in the impoundment.

Samples shall be composited unless stratification is observed. If stratification is present, discrete aliquots shall be taken as grab samples. If the waste stored in the impoundment is a homogeneous mixture (e.g., non-hazardous and/or F039 liquids), the sampling approach will be that of a non-stratified, free-flowing liquid.

12.2. SLUDGE PHASE

Enough sludge samples shall be collected from the surface impoundment to adequately represent the waste characteristics.

If the sludge on the bottom is less than three inches thick, CHGM shall collect four grab samples from the bottom and one from each side of the impoundment and composite them.

If the sludge thickness is three inches or more, at least four samples shall be collected from the thickest locations.

12.3. ANALYSIS OF SURFACE IMPOUNDMENT SAMPLES

CHGM will use a Utah Certified Laboratory to analyze the samples in accordance with permit condition V.D.4.

13.0 TEN-DAY TRANSFER OPERATIONS

CHGM may temporarily hold wastes that are manifested to another facility. These wastes may be stored for ten days or less, where day one is the first calendar day after arrival and day 10 ends at midnight of the 10th day at CHGM. There are no requirements for sampling or profile verification. CHGM shall comply with the transporter requirements in UAC R315-263-30 for these wastes. CHGM shall inspect the containers to ensure they are in good condition. The containers shall be segregated from other profiled wastes, clearly identified as 10-day wastes, and marked with the date of arrival. CHGM shall manage compatibility based on shipping paper information.

When this material is shipped off-site, the original manifest shall accompany the waste. The 10-day transfer loads shall be documented as part of the operating record.

Ten-day transfer waste is different from waste that is accepted for storage and then shipped to another facility. Waste that has been accepted for storage shall be re-manifested with CHGM as the generator when it is shipped.

14.0 STORAGE ONLY WASTES

CHGM may store RCRA and non-hazardous waste for up to one year. CHGM shall dispose of PCB waste streams within one year of the date of removal from service. Wastes intended for storage shall be profiled as described in Section 2.1. Upon arrival, CHGM shall complete a visual inspection as described in Section 2.5. If there is a variation in the weight, count, or type, CHGM will follow the discrepancy procedures in Section 2.8.

15.0 SPECIAL RECEIVING AND HANDLING PROCEDURES FOR TSCA WASTE

CHGM shall use its best efforts to complete the inspection/draining process, including the resolution of disputes with generators, as quickly as practicable. CHGM may use either paper or an electronic system to track the required PCB sampling. CHGM will track the number of loads of a waste stream that have been received and document which loads have been sampled.

For containerized PCB waste, CHGM shall sample at least 10% of the containers in each PCB waste stream prior to final disposal. After the load has been accepted, but before further processing, CHGM shall open and visually inspect all PCB waste containers. Containers on a manifest that have the same profile but appear on a different line due to different container types may be composited prior to analysis provided that the individual samples are similar in physical appearance.

For bulk PCB waste, CHGM shall sample one in every ten loads of a given waste stream. Once ten loads have been received and one of them has been sampled, the count restarts and at least one of the next ten loads shall be sampled. The sampling crew is responsible for determining

whether a given waste stream has been sampled within the last 10 loads. The samplers shall sample the first load every day that the waste stream is received and then the 11th ,21st, etc. load if that many are received in one day. If inconsistencies are documented during the receiving process, the sampling frequency shall be increased.

Most PCB-containing equipment that CHGM receives for disposal has already been drained, flushed, and had sorbent added. However, some PCB containing equipment such as transformers and hydraulic equipment may require draining and/or flushing. Sorbent material shall be added to the equipment prior to disposal. All draining and flushing of equipment shall be conducted in Drain and Flush Building Warehouse One (DFBWO). Once drained and flushed, the PCB-containing equipment shall be transported to a TSCA-permitted disposal cell.

Prior to landfilling, CHGM shall inspect drained PCB containing electrical equipment they receive to confirm that it has been drained. All PCB articles on each line item of each manifest shall be opened to check for the presence of free-flowing liquids. For equipment such as transformers, the inspection plates or access hatchways will be removed, and the interior will be visually inspected.

Visual inspections shall also verify that adequate sorbent material has been added to absorb any remaining liquids. At a minimum, sorbent approximately equal to 5% of the fluid capacity of the article should be present. If liquids are present or if there is insufficient sorbent, the articles shall be further drained, and sorbent added as needed.

PCB waste equipment and articles shall be drained in the permitted areas of DFBWO. All articles shall be fully opened by opening shut-off valves or removing drain plugs or caps and allowed to stand open for at least 30 minutes over a drain vat. Articles may be inverted, elevated at a slant, rotated, or otherwise moved to enhance drainage from complex internal geometries. Large transformers without drain plugs or valves shall be drained using a "stinger." PCB articles shall be allowed to drain until any stream or flow of liquid has ceased and only occasional drips remain. Flushing shall then take place as specified by 40 C.F.R. §761.

Finally, all valves shall be closed and drain plugs replaced to ensure no further dripping or leakage after the PCB article is removed from the drainage area. Sorbents shall be added through the inspection ports, to absorb liquids which may remain in the article. Sorbents shall equal approximately 5% of the fluid capacity of the article.

Not all PCB articles have inspection ports, drain valves, or plugs (for example, large, detachable ceramic PCB containing bushings). These articles may be opened by destructive means such as drilling, cracking, or breaking a hole in the ceramic with a hammer. If multiple isolated cavities are apparent, then multiple openings shall be made. Once opened, these articles shall be allowed to drain for at least 30 minutes and may be rotated, inverted, or otherwise moved to enhance drainage from complex internal geometries. When possible, sorbent shall be added to absorb liquids that could not be drained. The PCB articles will then be routed to the landfill for disposal.

Any free liquids remaining around drain ports or openings shall be wiped off with absorbent toweling. PCB articles that have been forcefully opened cannot be re-sealed, so some long-term seepage from the openings may be unavoidable. In addition, some oil staining of the exterior surface of the articles in the immediate area of the drain ports is considered normal and may remain.

Sorbent pads or toweling shall be wrapped or packed around any unsecured openings or valves known to be incompetent. Such wrapped articles shall be routed to a landfill cell for disposal within 24 hours after completion of the inspection/draining process or be stored in a PCB container for disposal. The 24-hour period allowed for disposal shall start when the article is removed from the PCB drain vats.

The time and date of removal from the drain vat shall be recorded as described below unless a specific notation is made otherwise.

- CHGM shall keep a record that includes the following:
  - The actions taken for each group of PCB articles.
  - The name of the technician performing those actions.
  - The date(s) the article(s) was/were handled.

Prior to transporting a PCB article to the landfill for disposal, the technician who inspected, drained, and flushed the article shall place their initials on it using an indelible marker.

16.0 PCB WASTE MANAGEMENT PROCEDURES

The following are examples of the types of PCB wastes that can be disposed of in a landfill at CHGM after receiving and acceptance procedures are complete:

- Contaminated debris and/or rags
- PCB-contaminated or small PCB capacitors
- Drained or drained and flushed PCB hydraulic machines per 40 C.F.R. § 761.60(b)(3)
- Drained PCB articles per 40 C.F.R. § 761.60(b)(5)(i)(B) and (ii) or containers per 40 C.F.R. § 761.60(c)(1)(ii) and (2)
- Flushed PCB transformers per 40 C.F.R. § 761.60(b)(1)(i)
- Asbestos or asbestos-containing materials contaminated with PCBs

The following PCB waste types shall be sampled and analyzed prior to disposal in the authorized cell:

- Contaminated soils
- All free liquids and sludges contaminated with <500 ppm PCB, provided that those wastes do not contain more than 10% TOC prior to solidification (e.g., dredged materials, industrial sludges, municipal sewage, and treatment sludges).

The following special PCB wastes shall be physically inspected to verify the contents; however, sampling and analysis is not required for disposal:

- Contaminated trash and debris – rags, clothing, sampling/analysis apparatus, contaminated lab debris, glassware, pallets, etc.
- "Empty" containers contaminated with PCB – this applies to a portable container that has been emptied but may hold residuals of PCBs. Examples of containers are portable tanks, drums, barrels, cans, bags, and liners. A container shall be determined "empty" according to the criteria in UAC R315-261-7.
- PCB equipment removed from service, provided that adequate information is available from the generator to determine regulatory status (e.g., PCB origin and concentration; manufacturer's status; etc.). Examples: fluorescent light tubes, microwave ovens and fixtures, and electronic equipment.
- PCB waste produced from the demolition or dismantling of industrial process equipment contaminated with PCBs. The generator must supply CHGM with sufficient chemical and physical characteristic information to allow them to properly manage the waste.

Containers requiring storage prior to landfill disposal shall be stored in the container storage area of DFBWO or in an area compliant with 40 C.F.R. § 761.65. "Staging" of PCB waste is only authorized for 30 calendar days or less in a permitted area outside of the TSCA disposal cell. Any PCB waste staged longer than 30 days shall be moved to the TSCA-approved storage area.

PCB wastes shall be managed in one of the 15 procedures in the following list:

1. Mineral oil dielectric fluid containing PCBs	May go to DFBWO for eventual shipment off-site to a suitable facility under 40 C.F.R. § 761.
2. Kerosene flushing fluid contaminated with PCBs	May go to DFBWO for eventual shipment off-site to a suitable facility under 40 C.F.R. § 761.
3. Commercially graded oil contaminated with PCBs	May go to DFBWO for eventual shipment off-site to a suitable facility under 40 C.F.R. § 761.
4. Other oils with <500 ppm PCB	May go to DFBWO for eventual shipment off-site to a suitable facility under 40 C.F.R. § 761.
5. Flushed PCB transformers, and transformers flushed at CHGM, with original PCB concentration >500 ppm per 40 C.F.R. § 761.60(b)(1)(i)	May go directly to a landfill for disposal after CHGM examines their physical appearance and completes the required inspections.
6. Asbestos/PCB-Contaminated Waste	May go directly to a landfill for disposal after CHGM examines their physical appearance and completes the required inspections.
7. Contaminated soil, debris and/or rags	May go directly to a landfill for disposal after CHGM examines their physical appearance and completes the required inspections.

8. Non-PCB (<50 ppm), PCB-contaminated, or small PCB capacitors	May go directly to a landfill for disposal after CHGM examines their physical appearance and completes the required inspections.
9. Drained or drained and flushed PCB hydraulic machines	May go directly to a landfill for disposal after CHGM examines their physical appearance and completes the required inspections.
10. Drained PCB articles or containers	May go directly to a landfill for disposal after CHGM examines their physical appearance and completes the required inspections. Note: this does not include transformers, which are addressed above.
11. Incidental Liquids <500 ppm PCB concentration (including solidified liquids) (40 C.F.R. § 761.60(a)(3))	CHGM shall complete a fingerprint analyses prior to accepting for final disposal. Fingerprint analyses, including any confirming additional analyses (i.e., PCB, TOC) shall be performed in a Utah Certified Laboratory. This type of waste shall be evaluated as described in Section 2.0. Aqueous-based liquids having a Specific Gravity of 1.0 ± 0.1, have a less than 10% separable oil phase, and demonstrates a TOC value of less than 10% may be solidified and landfilled. Liquids or sludges containing > 10% TOC shall be handled as PCB-contaminated oil and shipped offsite to a facility properly approved to manage PCBs of these types. In addition, if there is evidence to believe that the oil phase was diluted from > 500 ppm PCBs, the waste shall be managed according to Item 3 above.
12. Dredged materials, industrial sludges, and municipal sewage treatment sludges	CHGM shall complete a fingerprint analyses prior to accepting for final disposal. Fingerprint analyses (including any confirming additional analyses (i.e., PCB, TOC) shall be performed in a Utah Certified Laboratory.
13. Drained PCB-contaminated electrical equipment	May go directly to a landfill for disposal after CHGM examines their physical appearance and completes the required inspections.
14. Sludge-like chemical materials	CHGM shall complete a fingerprint analyses prior to accepting for final disposal. Fingerprint analyses, including any confirming additional analyses (i.e., PCB, TOC) shall be performed in a Utah Certified Laboratory. This type of waste shall be evaluated as described in Section 2.0. Aqueous-based liquids having a Specific Gravity of 1.0 ± 0.1, have a less than 10% separable oil phase, and demonstrates a TOC value of less than 10% may be solidified and landfilled. Liquids or sludges containing > 10% TOC shall be handled as PCB-contaminated oil and shipped offsite to a facility properly approved to manage PCBs of these types. In addition, if there is evidence to believe that the oil phase was diluted from > 500 ppm PCBs, the waste shall be managed according to Item 3 above.
15. Other PCB materials accepted for storage and transferred to off-site facilities	May go to DFBWO or the Drum Dock for eventual shipment off-site to a suitable facility under 40 C.F.R. § 761.

17.0 SPECIAL RECEIVING AND HANDLING PROCEDURES FOR WASTE CONTAINING ASBESTOS

The handling and disposal of asbestos is regulated under 40 C.F.R. § 61 Subpart M of the Clean Air Act. All asbestos-containing PCB waste is also subject to these requirements. Requirements of 40 C.F.R. § 61.154 include:

- Posting of warning signs on security fences;
- Daily cover (or once each 24-hours if operating continuously) of the asbestos waste, if there are any visible emissions from the site. Cover shall be non-asbestos-containing material at least six inches thick, or a sprayed-on resinous material.
- Reporting and recordkeeping.

For any management of containers of friable asbestos at CHGM, employees shall wear the standard Level C PPE.

Drummed, bagged, or boxed friable asbestos could contain a free liquid from the application of water as a wetting agent during asbestos abatement activities. To minimize the need to open containers of friable asbestos, CHGM shall observe loads of containerized friable asbestos to determine if any of the containers have free liquids. Wet cardboard on the bottom of boxed waste or pooled liquid at the bottom of bagged wastes are examples of visual indications of free liquids in the container.

- If the visual inspection identifies any container as potentially containing free liquids, the container shall be opened carefully so that no visible emissions occur and the liquid shall be drained into a drum, spill pan, or other collection device. Alternatively, the liquid may be stabilized with absorbing material.
- CHGM shall properly dispose of the drained or stabilized container.
- The liquid shall be analyzed according to Table C-1 to confirm that it is water.
  - If analysis confirms the liquid is water, it will be solidified and disposed of in a TSCA-approved cell.
  - If analysis indicates that the liquid is not water (i.e., specific gravity> 1.1 or < 0.9, or observed oil sheen), it will be shipped off-site for alternate disposal.

TABLES

Table C-1: Pre-acceptance, Storage, and Verification (Fingerprint) Analyses	
Parameter	**Rationale for Selection**
Physical Description	Shall be used to determine the general characteristics of the waste stream. This facilitates subjective comparison of the load sample with the approved profile.
pH Screen	Shall be required of all aqueous waste streams. It is used to indicate the corrosivity of the waste to ensure proper storage. It is also used as a parameter to compare the load sample to the approved profile.
Water Reactivity Screen	Shall be used to determine whether the waste has a potential to react with water to generate heat, flammable gases, or other products. Ensures prohibited waste is not accepted for storage or treatment unless approved by the Director. It is also used as a parameter to compare the load sample to the approved profile.
Reactive Sulfides Screen	Shall be used to indicate whether the waste produces hydrogen sulfide upon acidification below pH 2. It is also used as a parameter to compare the load sample to the approved profile. This screen is only conducted on wastes that have a pH > 2.0. Waste containing total releasable sulfide with concentrations less than 500 ppm are considered non-reactive. Not applicable to azide waste streams or others as approved by the Director.
Ignitability / VOC Screen	Shall be used to indicate the fire-producing potential of the waste, to indicate whether it might be a RCRA ignitable waste, or to indicate whether the waste is regulated as flammable or combustible by the U.S. Department of Transportation. This test can be applied to all waste liquids, semi-solids, or solids. The screen shall be supplemented with the flash point test for those materials exceeding 200 ppm if they are destined for land disposal. If the screened material > 500 ppm, CHGM may not process the waste. CHGM shall either resolve the disposition of the waste with the generator or reject the waste. This screen shall not be required if an ignitability test was already or will be performed or for wastes destined for incineration if the waste is treated as ignitable waste.
*LEL / VOC Screen	Shall be used in lieu of the Ignitability/VOC Screen. The VOC screen shall be used for all waste that is not required to be sampled but that will be treated in the stabilization system or stored in a tank. CHGM generated waste is excluded from this requirement. The VOC screen shall be used to detect volatile organics in the waste. A reading of > 10% LEL shall CHGM to perform the VOC screen or equivalent test on the waste. If the waste is < 500 ppm, it may be processed. If the waste is > 500 ppm, CHGM may not process the waste. CHGM shall either resolve the disposition of the waste with the generator or reject the waste.
Reactive Cyanides Screen	Shall indicate whether the waste produces hydrogen cyanide upon acidification below a pH of 2. It shall also be used as a parameter to compare the load sample to the approved profile. This screen is only conducted on wastes that have a pH > 2.0 Wastes containing

	total releasable cyanide with concentrations less than 250 ppm are considered non-reactive. Not applicable to azide waste streams or others as approved by the Director.
Oxidizer Screen	Shall be used to determine whether a waste is an oxidizer. Oxidizers have the potential to react with a wide range of waste streams and need to be segregated. It shall also be used as a parameter to compare the load sample to the approved profile. This screen is only conducted on wastes that have a pH > 2.0.
Radioactivity Screen	Shall be used to screen out radioactive waste, which is prohibited at CHGM. It shall also be used as a parameter to compare the load sample to the approved profile.
Specific Gravity	Shall be used for liquids to compare the load sample to the approved profile.
Waste Compatibility Qualitative Assessment	Shall be part of the profile approval procedures, the chemical characteristics (pH, corrosivity of non-aqueous wastes, reactivity, flammability, etc.) of waste streams shall be assessed by waste acceptance personnel. This assessment shall be based on information about the waste, not necessarily on any analyses.
Supplemental Discretionary Analyses	Shall be used when CHGM determines that additional analysis is required to properly manage the waste. Table C-2

Table C-2: Treatment & Supplemental Analysis	
Parameter	**Rationale for Selection**
RCRA Metals (As, Ba, Be, Cd, Cr, Pb, Hg, Ni, Ag, Sb, Se, Tl, Va, Zn)	Analysis of one or more of these metals may be required to demonstrate compliance with LDR standards.
Ignitability	Indicates the fire-producing potential of the waste and determines whether the waste is RCRA ignitable. It is also used as a parameter to compare the load sample to the approved profile.
Reactive Cyanide (Releasable)	Ensures waste is handled safely and determines if treatment may be required.
Reactive Sulfide (Releasable)	Ensures waste is handled safely and determines if treatment may be required.
Total Cyanide	May be required to demonstrate compliance with LDR standards.
Amenable Cyanide	May be required to demonstrate compliance with LDR standards.
No Free Liquids by Paint Filter	Analysis is necessary to ensure free liquids are not placed into the landfill. This procedure may be done in the stabilization area.
Specific Organic Analysis	Gas chromatography and gas chromatography/mass spectrometry may be used to identify and quantify specific regulated organic compounds, (i.e., listed waste constituents of concern, characteristic wastes, etc.) when the generator is unaware of the waste stream's composition.
Halogenated Organic Compounds (HOC) Screen	Used to detect the presence of HOC or leachable HOC that might adversely affect the cell liner. Any one of the three SK methods in Appendix 4 of this WAP may be used.
PCB Analysis	May be used to determine if PCBs are present in liquids, except for leachate and water, at less than 500 ppm and therefore amenable to solidification and landfilling. It is one of the two organic analyses required for determining the acceptability of liquid PCB wastes.
Total Organic Carbon (TOC) Analysis (for PCB liquids < 500 ppm)	May be used to determine if a liquid, except for leachate and water, contains organic compounds in concentrations that would allow solidification of waste prior to landfilling. Liquids or sludges containing <10% TOC must be solidified prior to landfilling or may be shipped off-site for disposal. Liquid or sludges containing ≥10% TOC cannot be managed at CHGM.

Table C-3: Specific PCB Waste Type of Analyses	
PCB Waste Type	**Analyses Run**
Contaminated debris/trash, etc. (including demolition materials)	Physical Appearance
Empty containers, tanks, drums, barrels, liners, etc.	Physical Appearance
PCB Contaminated or small capacitors*	Physical Appearance
Drained or drained and flushed PCB hydraulic machines.	Physical Appearance
Drained PCB Articles or containers and article containers/electrical equipment.	Physical Appearance
Flushed PCB transformers.	Physical Appearance
Contaminated soil or sludges (e.g., dredged materials, industrial sludges, municipal sewage, treatment sludges) that DO NOT require organic analyses per this WAP.	Physical Appearance pH VOC Screen Reactive Cyanides(1) Reactive Sulfides(2) PCB Concentration(3) Leachable Total Organic Carbon (TOC)(4) Paint Filter Liquids Test (PFLT)(5)
Liquids (leachate, tire wash water, ground water, etc.) from onsite TSCA operations.	Physical Appearance pH VOC Screen Specific Gravity Reactive Cyanides(1) Reactive Sulfides(2) PCB Concentration(3) Leachable TOC(4) PLFT(6)

Table C-3: Notes

*Defined as smaller than 100 in^3 or between 100 in^3 and 200 in^3 and weighing less than 9 lbs.

1. Reactive Cyanides Screen shall be run to indicate whether the PCB waste produces hydrogen cyanide upon acidification below pH 2. It is not required if the pH of the waste is less than 6, if the waste is not water-soluble, or if the waste is not aqueous.
2. Reactive Sulfides Screen shall be run to indicate whether the PCB waste produces hydrogen sulfide upon acidification below pH 2. It is not required if the pH of the waste is less than 6, or if the waste is not water-soluble, or if the waste is not aqueous.
3. PCB concentration: If the liquid is water with no visual indication of oil, the PCB concentration need not be determined. If a phase separation is indicated, the oil shall be analyzed for PCBs, but analysis of the water is not required; any free oil phase shall be removed and handled separately as a PCB-contaminated oil. If there is doubt as to whether the liquid is water, a specific gravity test shall be conducted on the liquid. If the specific gravity is not 1.0 within +/- 0.10 accuracy, the waste profile sheet shall be reviewed and a determination as to the type of liquid shall be made.
4. If the liquids appear to be an oil/water emulsion, water/soil slurry or suspension, or a similar aqueous-based liquid, both the specific gravity test and a TOC or PCB test shall be conducted. Liquids that have a specific gravity of 1.0 ± 0.1 that also contain less than 10% TOC or < 50 ppm PCB may be approved for solidification and landfill. Any liquids outside of these parameters shall be handled separately as PCB contaminated oil.
5. If there is doubt as to the presence or absence of free liquids via the physical appearance determination, CHGM shall run the PFLT.
6. PFLT Test is run to determine if solidified materials are suitable for TSCA landfill management (disposal).

Table C-4: Methods and Tolerance Limits	
Parameter Limits	**Tolerance**
Physical Description	Shall be consistent with profile.
Specific Gravity	± 20%
pH Screen	± 2 pH units if the profile pH is >2 and < 12.5. If the profile pH is ≤ 2 or ≥ 12.5, the incoming load sample must be the same.
VOC Screen	If > 200 ppm, and destined for landfill, flash point shall be conducted. If the VOC Screen is <200 ppm, the flashpoint is considered >140°F and it may be disposed of in a landfill. Shall be < 500 ppm if destined for storage or treatment in tanks.
Water Reactivity Screen	No tolerance; load samples must agree with profile.
Reactive Sulfides Screen	Shall be consistent with profile [1, 2]
Reactive Cyanides Screen	Shall be consistent with profile [1, 3]
Ignitability	Shall be consistent with profile (e.g., if profile is reported as being >140°F it must test >140°F).
Radioactivity Screen	No tolerance; load samples shall be less than 40 microR/hr over background unless authorization is obtained as described in Module II.D.2. No explanation is required for waste profiled with a positive radioactive screen and arriving with a negative screen.
Oxidizer Screen	Shall be consistent with profile. [1]
HOC Screen or Specific Analysis of those chemicals in Appendix 3 of this WAP	The limit shall be 1000 ppm HOCs or equivalent leachable HOCs by either method. If the screen shows > 1000 ppm or equivalent leachable HOC, the specific Appendix 3 analysis shall be used to determine if the waste contains > 1000 ppm of those compounds or the equivalent that are leachable. If it does, the waste shall either be retreated until it no longer contains >1000 ppm of these compounds or the equivalent leachable HOCs or it will not be land-disposed at CHGM.

Table C-4: Notes

Test methods will be certified or approved for use by a Utah Certified Lab.

1. For out of tolerance results or results inconsistent with the profile, CHGM shall contact the generator for an explanation of the difference. The answer and any follow-up from CHGM shall be documented in CHGM's operating record.
2. If this material is to be disposed of directly into the landfill, an increase above 500 ppm for sulfide shall require explanation, further analysis, or different handling.
3. If this material is to be disposed of directly into the landfill, an increase above 250 ppm for CN shall require explanation, further analysis, or different handling.

Table C-5: Analytical Parameters and Associated Methods		
PARAMETER	**METHOD NUMBER**	**REFERENCE**
*Acid-Base Partition Cleanup	3650	(1)
*Acid Digestion of Sediments, Sludges, and Soils	3050	(1)
*Acid Digestion of Aqueous Samples and Extracts for Total Metals for Analysis by Flame Atomic Absorption Spectroscopy or Inductively Coupled Plasma Spectroscopy	3010 3010-MOD 3005	(1)
*Acid Digestion of Aqueous Samples and Extracts for Total Metals for Analysis by Furnace Atomic Absorption Spectroscopy	3020	(1)
*Alumina Column Cleanup	3610	(1)
*Aluminum (AA)	7020	(1)
*Aluminum (ICP) (ICP/MS)	6010 6020	(1)
*Antimony (ICP) (ICP/MS)	6010 6020	(1)
*Antimony (AA)	7040 7041	(1) (1)
*Aromatic and Halogenated Volatile Organics	8021	(1)
*Arsenic (ICP) (ICP/MS)	6010 6020	(1)
*Arsenic (AA)	7060 7061	(1)
*Ash	D482	(2)
*Atomic Absorption Spectroscopy	7000	(1)

Table C-5: Analytical Parameters and Associated Methods		
PARAMETER	**METHOD NUMBER**	**REFERENCE**
*Barium (ICP) (ICP/MS)	6010 6020	(1)
*Barium (AA)	7080 7081	(1) (1)
*Beryllium (ICP) (ICP/MS)	6010 6020	(1)
*Beryllium (AA)	7090 7091	(1) (1)
*Bromide	9056	(1)
Bulk Density, Solids	D5057	(2)
*Cadmium (ICP) (ICP/MS)	6010 6020	(1)
*Cadmium (AA)	7130 7131	(1) (1)
*Calcium (ICP) (ICP/MS)	6010 6020	(1)
*Calcium (AA)	7140	(1)
*Carbamate pesticides (LCMS)	8321	(1)
*Chloride	9253	(1)
*Chloride (Ion Chromatography)	9056	(1)
*Chlorinated Herbicides	8151 8151-MOD	(1) (1)
*Chromium (ICP) (ICP/MS)	6010 6020	(1)

Table C-5: Analytical Parameters and Associated Methods		
PARAMETER	**METHOD NUMBER**	**REFERENCE**
*Chromium (AA)	7190 7191	(1) (1)
*Cobalt (ICP) (ICP/MS)	6010 6020	(1)
*Cobalt (AA)	7201	(1)
*Copper (ICP) (ICP/MS)	6010 6020	(1)
*Copper (AA)	7210 7211	(1) (1)
*Continuous Liquid-Liquid Extraction	3520	(1)
* Dithiocarbamates as Ziram, total	630 and 630-MOD / Modified CDFA Procedure	(3) and (12)
*Fluoride (Ion Chromatography)	9056	(1)
*Fluoride	340.2 5050 D3987	(3) (1) (2)
*Florisil Column Cleanup	3620	(1)
*Gas Chromatography	8000	(1)
*Gas Chromatography/Mass Spectrometry for Volatile Organics	8260	(1)
*Gas Chromatography/Mass Spectrometry for Semi-volatile Organics	8270	(1)
*Gel-Permeation Cleanup	3640	(1)
*Halogenated Volatile Organics	8010 8021	(1) (1)

Table C-5: Analytical Parameters and Associated Methods		
PARAMETER	**METHOD NUMBER**	**REFERENCE**
*Headspace	3810	(1)
*Heat of Combustion (BTU)	D240 D240-MOD 5050	(2) (2) (1)
HOC Screen (Oil, Soil, Water)	9078	(1)
HOC Screen (Oil)	D-5384, 9077	(2), (1)
*HOC Screen	22 a*/b 9022 9023	(4) (1) (1)
*Ion Chromatography	9056	(1)
Ignitability, Setaflash	D3278	(2)
Ignitability, Pensky Marten, actual flashpoint	1010	(1)
Ignitability Liquid, actual flashpoint, no suspended solids	1020	(1)
Ignitability Liquid, at 140°F, no suspended solids	8b	(4)
Ignitability Liquid or Solids, room temperature	D4982	(2)
Ignitability Sludge, at 140°F	8b	(4)
*Iron (AA)	7380 7381	(1) (1)
*Iron (ICP) (ICP/MS)	6010 6020	(1)
*Lead (ICP) (ICP/MS)	6010 6020	(1)
*Lead (AA)	7420 7421	(1) (1)

Table C-5: Analytical Parameters and Associated Methods		
PARAMETER	**METHOD NUMBER**	**REFERENCE**
LEL	14	(4)
Liquids, Sludge Compatibility (see note 3)	D5058	(2)
*Magnesium (ICP) (ICP/MS)	6010 6020	(1)
*Magnesium (AA)	7450	(1)
*Manganese (ICP) (ICP/MS)	6010 6020	(1)
*Manganese (AA)	7460 7461	(1) (1)
*Mercury Cold Vapor (AA) (ICP/MS)	7470 6020 7471	(1) (1)
*Microwave Assisted Acid Digestion of Aqueous Samples and Extracts	3015	(1)
*Microwave Assisted Acid Digestion of Sediments, Sludges, Soils and Oils	3051	(1)
*Moisture (organic liquids)	D1533	(2)
*Moisture (Inorganics)	2540	(5)
*Molybdenum (ICP) (ICP/MS)	6010 6020	(1)
*Molybdenum (AA)	7480 7481	(1) (1)
*Nickel (ICP) (ICP/MS)	6010 6020	(1)
*Nickel (AA)	7520	(1)
*Total Kjeldahl Nitrogen	D3590	(2)

Table C-5: Analytical Parameters and Associated Methods		
PARAMETER	**METHOD NUMBER**	**REFERENCE**
*Nitrate/Nitrite Ion Chromatography	9056	(1)
*Nitrogen, Total	7.025-7.031	(7)
*Nonhalogenated Volatile Organics	8015	(1)
*Organic Extraction and Sample Preparation	3500	(1)
*Organochlorine Pesticides	8081	(1)
*Organophosphorus Compounds by Capillary Column GC	8141	(1)
Oxidizer Screen	D4981	(2)
Paint Filter	9095	(1)
*PCDD	8280 8290	(1) (1)
*PCDF	8280 8290	(1) (1)
*PCBs	8082	(1)
*PCB and Pesticides (GC/MS)	680	(6)
*PCB Wipes	5503	(8)
pH Screen	D4980	(2)
pH Electrometric	9040	(1)
pH Paper	9041	(1)
pH Waste	9045	(1)
pH Solids	9045	(1)
Physical Description	D4979	(2)

Table C-5: Analytical Parameters and Associated Methods		
PARAMETER	**METHOD NUMBER**	**REFERENCE**
*Potassium (ICP) (ICP/MS)	6010 6020	(1)
*Potassium (AA)	7610	(1)
*Purge-and-Trap	5030	(1)
Radioactivity Screen	N/A	(4)
Reactive Cyanide Screen (see note 2)	D5049	(2)
Reactive Sulfide Screen Confirmation (see note 2)	D4978	(2)
*Cyanide (Releasable)	Chapter 7, Sec. 7.3.3.2	(1)
*Sulfide (Releasable)	Chapter 7 Sec. 7.3.4.2	(1)
*Selenium (ICP) (ICP/MS)	6010 6020	(1)
*Selenium (AA)	7740 7741	(1) (1)
*Separatory Funnel Liquid-Liquid Extraction	3510	(1)
*Silica Gel Cleanup	3630	(1)
*Silver (ICP) (ICP/MS)	6010 6020	(1)
*Silver (AA)	7760 7761	(1) (1)
*Sodium (ICP) (ICP/MS)	6010 6020	(1)
*Sodium (AA)	7770	(1)

Table C-5: Analytical Parameters and Associated Methods		
PARAMETER	**METHOD NUMBER**	**REFERENCE**
Solids Compatibility (see note 3)	N/A D5058	(9) (2)
*Sonication Extraction	3550	(1)
*Soxhlet Extraction	3540	(1)
Specific Conductance	120.1	3)
Specific Gravity Specific Gravity/ Bulk Density	D1429 D5057	(2) (2)
*Sulfides	9030 9031 9034* 376.1	(1) (1) (1) (3)
*Sulfate Ion Chromatography	9056	(1)
*Sulfur	D2784 D1266	(2) (2)
*Sulfur Cleanup	3660	(1)
*Sulfuric Acid Cleanup	3665	(1)
*Thallium (ICP) (ICP/MS)	6010 6020	(1)
*Thallium (AA)	7841 7840	(1) (1)
*Tin (ICP) (ICP/MS)	6010 6020	(1)
*TCLP	1311	(1)
VOC Screen	5 5-MOD	(4)

Table C-5: Analytical Parameters and Associated Methods		
PARAMETER	**METHOD NUMBER**	**REFERENCE**
*Total and Amenable Cyanide (Distillation)	9010	(1)
*Total and Amenable Cyanide (Colorimetric, Automated UV)	9012	(1)
*Titrimetric and Manual Spectrophotometric Determinative Methods for Cyanide	9014	(1)
*Total Organic Carbon	9060	(1)
*Total Halogen	5050 9253 9056 9212	(1) (1)
*Vanadium (ICP) (ICP/MS)	6010 6020	(1)
*Vanadium (AA)	7910 7911	(1) (1)
*Viscosity	D2983	(2)
*Volatile Organic Compounds	21 25 All Listed	(10) (10) (11)
Waste Compatibility Qualitative Assessment	12	(4)
*Waste Dilution	3580	(1)
Water Reactivity Screen (see note 1)	D5058	(2)
*Zinc (ICP) (ICP/MS)	6010 6020	(1)
*Zinc (AA)	7950 7951	(1) (1)
** typically conducted at an off-site laboratory*		

Table C5: References for Analytical Parameters and Associated Methods

(1) Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, EPA Publication SW-846.

(2) American Society for Testing and Materials.

(3) Methods for Chemical Analysis of Water and Wastes, EPA 600/4-79-020.

(4) Facility Methods, not based on any standard method.

(5) Standard Methods for the Examination of Water and Wastewater, Latest Edition, APHA, WEF.

(6) Alford-Steven, A.; Eichelberger, J.W. and Budde, W.L. Method 680. Determination of Pesticides and PCBs in Water and Soil/Sediment by Gas Chromatography/Mass Spectrometry. Physical and Chemical Methods Branch. Environmental Monitoring and Support Laboratory Office of Research and Development. U.S. EPA, Cincinnati, Ohio 45268. November 1985.

(7) Association of Official Analytical Chemists, 14th Edition.

(8) National Institute for Occupational Safety and Health.

(9) A Method for Determining the Compatibility of Hazardous Wastes, EPA-600/2-80-076, April 1980.

(10) 40 C.F.R. § 60 Appendix A.

(11) 40 C.F.R. § 265.1085 (c).

(12) Method 630 is for liquids. Method 630-MOD / Modified California Department of Food and Agriculture (CDFA) Procedure was developed for solids. Both rely on the fact that when dithiocarbamates are acidified, carbon disulfide is released. Method 630 is a colorimetric method while 630-MOD / Modified CDFA Procedure analyzes the headspace by gas chromatography using a FPD detector. GMF could only find one commercial lab in the USA that analyzes total dithiocarbamates in solids: Environmental Micro Analysis (E.M.A. Inc.) in Woodland, CA. The modified method is theirs.

Table C-5: NOTES

(1) A significant temperature rise is defined as ≥15°C (paragraph 24.8, ASTM method D5058-90). The test does not apply to waste already in contact with excess water, nor is a wastewater reactive if the heat generation is due solely to a strong acid/base reaction as verified by pH analysis or heat of solution (e.g., lime is not water reactive). Occurrence of the reactions listed in paragraph 24.4 of ASTM method D5058-90 result in failure of the water reactivity test, except that formations of precipitates or emulsions are considered failures only if the ability to mix and pump the resulting liquids is impaired.

(2) The test is not required for wastes with pH < 2.

(3) A temperature rise is defined as ≥ 15°C (paragraph 11.8, ASTM method D5058-90). Occurrence of the reactions listed in paragraph 11.7 of ASTM method D5058-90 result in failure of the compatibility test, except that formations of layers, precipitation, emulsification, or increases in viscosity are considered failures only if the ability to manage the resulting liquids is impaired.

(4) Test methods will be certified or approved for use by a Utah Certified Lab.

TABLE C-6

Tier Testing Sampling Frequency

Tier Number	Batch Number	Testing Y/N
1	1 – 9	Y
2	10	Y
	11 – 14	N
	15	Y
	16 – 19	N
3	20	Y
	21 – 29	N
	30	Y
	31-39	N
	40	Y
	41-49	N

EXHIBIT

EXAMPLE WASTE MATERIAL PROFILE SHEET

(THIS FORM IS SUBJECT TO CHANGE)

WASTE MATERIAL PROFILE SHEET

Clean Harbors Profile No. CH639323

A. GENERAL INFORMATION

GENERATOR EPA ID #/REGISTRATION # ***UTD991301748*** GENERATOR NAME: ***Clean Harbors Grassy Mountain LLC***

GENERATOR CODE (Assigned by Clean Harbors) ***GM*** CITY ***Grantsville*** STATE/PROVINCE ***UT*** ZIP/POSTAL CODE ***84029***

ADDRESS ***3 Miles East 7 Miles North of Knolls Exit 41 off I-80*** PHONE: **(435) 884-8900**

CUSTOMER CODE (Assigned by Clean Harbors) ***GM*** CUSTOMER NAME: ***Clean Harbors Grassy Mountain LLC***

ADDRESS ***3 Miles East 7 Miles North of Knolls Exit 41 off I-80*** CITY ***Grantsville*** STATE/PROVINCE ***UT*** ZIP/POSTAL CODE ***84029***

B. WASTE DESCRIPTION

WASTE DESCRIPTION:

PROCESS GENERATING WASTE:

IS THIS WASTE CONTAINED IN SMALL PACKAGING CONTAINED WITHIN A LARGER SHIPPING CONTAINER ?

C. PHYSICAL PROPERTIES (at 25C or 77F)

PHYSICAL STATE
- SOLID WITHOUT FREE LIQUID
- POWDER
- MONOLITHIC SOLID
- LIQUID WITH NO SOLIDS
- LIQUID/SOLID MIXTURE
- % FREE LIQUID
- % SETTLED SOLID
- % TOTAL SUSPENDED SOLID
- SLUDGE
- GAS/AEROSOL

NUMBER OF PHASES/LAYERS

1 2 3 % BY VOLUME (Approx.)

TOP ***0.00***
MIDDLE ***0.00***
BOTTOM ***0.00***

VISCOSITY (If liquid present)
- 1 - 100 (e.g. Water)
- 101 - 500 (e.g. Motor Oil)
- 501 - 10,000 (e.g. Molasses)
- > 10,000

COLOR

ODOR
- NONE
- MILD
- STRONG

Describe:

BOILING POINT °F (°C)
- <= 95 (<=35)
- 95 - 100 (35-38)
- 101 - 129 (38-54)
- >= 130 (>54)

MELTING POINT °F (°C)
- < 140 (<60)
- 140-200 (60-93)
- > 200 (>93)

TOTAL ORGANIC CARBON
- <= 1%
- 1-9%
- >= 10%

FLASH POINT °F (°C)
- < 73 (<23)
- 73 - 100 (23-38)
- 101 -140 (38-60)
- 141 -200 (60-93)
- > 200 (>93)

pH
- <= 2
- 2.1 - 6.9
- 7 (Neutral)
- 7.1 - 12.4
- >= 12.5

SPECIFIC GRAVITY
- < 0.8 (e.g. Gasoline)
- 0.8-1.0 (e.g. Ethanol)
- 1.0 (e.g. Water)
- 1.0-1.2 (e.g. Antifreeze)
- > 1.2 (e.g. Methylene Chloride)

ASH
- < 0.1
- 0.1 - 1.0
- 1.1 - 5.0
- 5.1 - 20.0
- > 20
- Unknown

BTU/LB (MJ/kg)
- < 2,000 (<4.6)
- 2,000-5,000 (4.6-11.6)
- 5,000-10,000 (11.6-23.2)
- > 10,000 (>23.2)

Actual:

D. COMPOSITION (List the complete composition of the waste, include any inert components and/or debris. Ranges for individual components are acceptable. If a trade name is used, please supply an MSDS. Please do not use abbreviations.)

CHEMICAL	MIN	--	MAX	UOM

DOES THIS WASTE CONTAIN ANY HEAVY GAUGE METAL DEBRIS OR OTHER LARGE OBJECTS (EX., METAL PLATE OR PIPING >1/4" THICK OR >12" LONG, METAL REINFORCED HOSE >12" LONG, METAL WIRE >12" LONG, METAL VALVES, PIPE FITTINGS, CONCRETE REINFORCING BAR OR PIECES OF CONCRETE >3")? YES NO

If yes, describe, including dimensions:

DOES THIS WASTE CONTAIN ANY METALS IN POWDERED OR OTHER FINELY DIVIDED FORM? YES NO

DOES THIS WASTE CONTAIN OR HAS IT CONTACTED ANY OF THE FOLLOWING; ANIMAL WASTES, HUMAN BLOOD, BLOOD PRODUCTS, BODY FLUIDS, MICROBIOLOGICAL WASTE, PATHOLOGICAL WASTE, HUMAN OR ANIMAL DERIVED SERUMS OR PROTEINS OR ANY OTHER POTENTIALLY INFECTIOUS MATERIAL? YES NO

I acknowledge that this waste material is neither infectious nor does it contain any organism known to be a threat to human health. This certification is based on my knowledge of the material. Select the answer below that applies:

The waste was never exposed to potentially infectious material. YES NO

Chemical disinfection or some other form of sterilization has been applied to the waste. YES NO

I ACKNOWLEDGE THAT THIS PROFILE MEETS THE CLEAN HARBORS BATTERY PACKAGING REQUIREMENTS. YES NO

I ACKNOWLEDGE THAT MY FRIABLE ASBESTOS WASTE IS DOUBLE BAGGED AND WETTED. YES NO

SPECIFY THE SOURCE CODE ASSOCIATED WITH THE WASTE.

SPECIFY THE FORM CODE ASSOCIATED WITH THE WASTE.

E. CONSTITUENTS

Are these values based on testing or knowledge? Knowledge Testing

If constituent concentrations are based on analytical testing, analysis must be provided. Please attach document(s) using the link on the Submit tab.

Please indicate which constituents below apply. Concentrations must be entered when applicable to assist in accurate review and expedited approval of your waste profile. Please note that the total regulated metals and other constituents sections require answers.

RCRA	REGULATED METALS	REGULATORY LEVEL (mg/l)	TCLP mg/l	TOTAL	UOM	NOT APPLICABLE
D004	ARSENIC	5.0				
D005	BARIUM	100.0				
D006	CADMIUM	1.0				
D007	CHROMIUM	5.0				
D008	LEAD	5.0				
D009	MERCURY	0.2				
D010	SELENIUM	1.0				
D011	SILVER	5.0				
	VOLATILE COMPOUNDS					
D018	BENZENE	0.5				
D019	CARBON TETRACHLORIDE	0.5				
D021	CHLOROBENZENE	100.0				
D022	CHLOROFORM	6.0				
D028	1,2-DICHLOROETHANE	0.5				
D029	1,1-DICHLOROETHYLENE	0.7				
D035	METHYL ETHYL KETONE	200.0				
D039	TETRACHLOROETHYLENE	0.7				
D040	TRICHLOROETHYLENE	0.5				
D043	VINYL CHLORIDE	0.2				
	SEMI-VOLATILE COMPOUNDS					
D023	o-CRESOL	200.0				
D024	m-CRESOL	200.0				
D025	p-CRESOL	200.0				
D026	CRESOL (TOTAL)	200.0				
D027	1,4-DICHLOROBENZENE	7.5				
D030	2,4-DINITROTOLUENE	0.13				
D032	HEXACHLOROBENZENE	0.13				
D033	HEXACHLOROBUTADIENE	0.5				
D034	HEXACHLOROETHANE	3.0				
D036	NITROBENZENE	2.0				
D037	PENTACHLOROPHENOL	100.0				
D038	PYRIDINE	5.0				
D041	2,4,5-TRICHLOROPHENOL	400.0				
D042	2,4,6-TRICHLOROPHENOL	2.0				
	PESTICIDES AND HERBICIDES					
D012	ENDRIN	0.02				
D013	LINDANE	0.4				
D014	METHOXYCHLOR	10.0				
D015	TOXAPHENE	0.5				
D016	2,4-D	10.0				
D017	2,4,5-TP (SILVEX)	1.0				
D020	CHLORDANE	0.03				
D031	HEPTACHLOR (AND ITS EPOXIDE)	0.008				

OTHER CONSTITUENTS	MAX	UOM	NOT APPLICABLE
BROMINE			
CHLORINE			
FLUORINE			
IODINE			
SULFUR			
POTASSIUM			
SODIUM			
AMMONIA			
CYANIDE AMENABLE			
CYANIDE REACTIVE			
CYANIDE TOTAL			
SULFIDE REACTIVE			

HOCs

NONE
< 1000 PPM
>= 1000 PPM

PCBs

NONE
< 50 PPM
>=50 PPM

IF PCBS ARE PRESENT, IS THE WASTE REGULATED BY TSCA 40 CFR 761?

YES NO

ADDITIONAL HAZARDS

DOES THIS WASTE HAVE ANY UNDISCLOSED HAZARDS OR PRIOR INCIDENTS ASSOCIATED WITH IT, WHICH COULD AFFECT THE WAY IT SHOULD BE HANDLED?

YES NO (If yes, explain)

CHOOSE ALL THAT APPLY

DEA REGULATED SUBSTANCES	EXPLOSIVE	FUMING	OSHA REGULATED CARCINOGENS
POLYMERIZABLE	RADIOACTIVE	REACTIVE MATERIAL	NONE OF THE ABOVE

F. REGULATORY STATUS

YES NO USEPA HAZARDOUS WASTE?

YES NO DO ANY STATE WASTE CODES APPLY?

Texas Waste Code

YES NO DO ANY CANADIAN PROVINCIAL WASTE CODES APPLY?

YES NO IS THIS WASTE PROHIBITED FROM LAND DISPOSAL WITHOUT FURTHER TREATMENT PER 40 CFR PART 268?

LDR CATEGORY:
VARIANCE INFO:

YES NO IS THIS A UNIVERSAL WASTE?

YES NO IS THE GENERATOR OF THE WASTE CLASSIFIED AS A VERY SMALL QUANTITY GENERATOR (VSQG) OR A STATE EQUIVALENT DESIGNATION?

YES NO IS THIS MATERIAL GOING TO BE MANAGED AS A RCRA EXEMPT COMMERCIAL PRODUCT, WHICH IS FUEL (40 CFR 261.2 (C)(2)(II))?

YES NO DOES TREATMENT OF THIS WASTE GENERATE A F006 OR F019 SLUDGE?

YES NO IS THIS WASTE STREAM SUBJECT TO THE INORGANIC METAL BEARING WASTE PROHIBITION FOUND AT 40 CFR 268.3(C)?

YES NO IS THIS WASTE STREAM "USED OIL" WHICH IS TO BE MANAGED UNDER 40 CFR PART 279 - STANDARDS FOR THE MANAGEMENT OF USED OIL?

YES NO DOES THIS WASTE CONTAIN VOC'S IN CONCENTRATIONS >=500 PPM?

YES NO DOES THE WASTE CONTAIN GREATER THAN 20% OF ORGANIC CONSTITUENTS WITH A VAPOR PRESSURE >= .3KPA (.044 PSIA)?

YES NO DOES THIS WASTE CONTAIN AN ORGANIC CONSTITUENT WHICH IN ITS PURE FORM HAS A VAPOR PRESSURE > 76.6 KPA (11.1 PSIA)?

YES NO IS THIS CERCLA REGULATED (SUPERFUND) WASTE ?

YES NO IS THE WASTE SUBJECT TO ONE OF THE FOLLOWING NESHAP RULES?

Hazardous Organic NESHAP (HON) rule (subpart G) Pharmaceuticals production (subpart GGG)

YES NO IF THIS IS A US EPA HAZARDOUS WASTE, DOES THIS WASTE STREAM CONTAIN BENZENE?

YES NO Does the waste stream come from a facility with one of the SIC codes listed under benzene NESHAP or is this waste regulated under the benzene NESHAP rules because the original source of the waste is from a chemical manufacturing, coke by-product recovery, or petroleum refinery process?

YES NO Is the generating source of this waste stream a facility with Total Annual Benzene (TAB) >10 Mg/year?

What is the TAB quantity for your facility? Megagram/year (1 Mg = 2,200 lbs)

The basis for this determination is: Knowledge of the Waste Or Test Data Knowledge Testing

Describe the knowledge :

G. DOT/TDG INFORMATION

DOT/TDG PROPER SHIPPING NAME:

H. TRANSPORTATION REQUIREMENTS

ESTIMATED SHIPMENT FREQUENCY ONE TIME WEEKLY MONTHLY QUARTERLY YEARLY OTHER

CONTAINERIZED

0-0 CONTAINERS/SHIPMENT

STORAGE CAPACITY:
CONTAINER TYPE:

PORTABLE TOTE TANK BOX|CARTON|CASE

CUBIC YARD BOX DRUM

OTHER: DRUM SIZE:

BULK LIQUID

GALLONS/SHIPMENT: ***0 Min -0 Max*** GAL.

BULK SOLID

SHIPMENT UOM: TON YARD

TONS/YARDS/SHIPMENT: ***0 Min - 0 Max***

I. SPECIAL REQUEST

COMMENTS OR REQUESTS:

GENERATOR'S CERTIFICATION

I certify that I am authorized to execute this document as an authorized agent. I hereby certify that all information submitted in this and attached documents is correct to the best of my knowledge.I also certify that any samples submitted are representative of the actual waste.If Clean Harbors discovers a discrepancy during the approval process, Generator grants Clean Harbors the authority to amend the profile, as Clean Harbors deems necessary, to reflect the discrepancy.

AUTHORIZED SIGNATURE NAME (PRINT) TITLE DATE

Addendum

B. WASTE DESCRIPTION

Waste Material Profile Certification

Waste is being transported in the form of a combination package. A combination package is defined for transportation purposes as consisting of one or more inner packages secured in a non-bulk outer packaging.

The following conditions have been met and the listed material(s) have been properly classified, packaged, marked and labeled, and are in proper condition for transportation.

Shipping Containers:

- When applicable, must be a UN approved & stamped container
- Acids or bases when present will be packaged in poly containers

YES NO

Packaging Material and Inner Containers:

- All containers must utilize an absorbent or compatible packaging material.
- All inner containers are sealed and packaged upright.
- All inner containers are chemically compatible with the waste material.
- Glass containers will not exceed one gallon.
- Metal and plastic containers will not exceed 5.3 gallons if liquid or 50 lbs if solid.

YES NO

D. COMPOSITION

F. REGULATORY STATUS

APPENDICES

APPENDIX 1: QUALITY ASSURANCE PLAN (QAP)

Modifications to this QAP constitute a Class 1 modification to the permit and may be made without prior approval of the Director if the changes are necessary to stay current with the most recent SW-846 methods or to comply with Utah Public Health Laboratory requirements. A copy of the modified QAP must be provided to the Director within seven days of making the changes.

_____ _____

LABORATORY / TECHNICAL MANAGER DATE

1.0 QUALITY ASSURANCE PLAN DESCRIPTION

Data of unknown quality is useless. It is this premise on which CHGM bases its approach to quality control. Quality control (QC) must be an integral part of daily operations and relies on everyone within the program to make data quality their primary objective.

There are three primary areas where data quality is of concern. They are as follows:

1. Waste Approval: CHGM examines the chemical and physical properties of each waste stream and determines if it can accept the material under its permit conditions.
2. Waste Acceptance: CHGM performs quality control checks to determine that the waste received is the same waste that was previously approved. CHGM also assesses the waste's compatibility with other wastes already being stored.
3. Treatment Residue Monitoring: CHGM conducts sampling and analysis to demonstrate that treated wastes meet the requirements of the Land Disposal Restrictions prior to land disposal.

This manual identifies the policies, organizational objectives, functional objectives, and specific quality activities designed to achieve the quality goals desired for operation of the laboratory. This manual describes the measures the laboratory employs to implement the quality assurance program. It is intended to be flexible and adapt to changes in methods, techniques, and personnel. This plan does not apply to analyses that may be performed to assist in determining treatment recipes.

1.1. PURPOSE

The purpose of this QAP is to ensure that all information, data, and resulting decisions are technically sound, statistically valid, properly documented, and are adequate to meet the requirements for which they are performed.

Quality Assurance (QA) is the program that plans, designs, and monitors QA procedures and affirms the data quality in reports.

Quality Control (QC) is the program through which QA achieves its goals. QC defines the frequency and methods of checks, audits, and reviews necessary to identify problems and dictate corrective action.

1.2. SCOPE

The QAP encompasses the entire measurement system from initial sampling to the final reporting and interpretation of results. This QAP is for the CHGM laboratory. Data generated by Utah Certified Laboratories for CHGM must meet the requirements of this QAP.

1.3. OBJECTIVE

This QAP is designed to produce accurate and reliable data. To accomplish this objective, the following criteria have been met:

- All procedures and practices must be accepted by the client and/or regulatory agency.
- An ongoing review process shall monitor the performance of the program.
- A mechanism is employed to correct problems that are identified by the monitoring assessment.

2.0 LABORATORY ORGANIZATION AND RESPONSIBILITY

The organizational structure of the laboratory is shown in Figure 2.1 and a description of the laboratory roles and responsibilities is below.

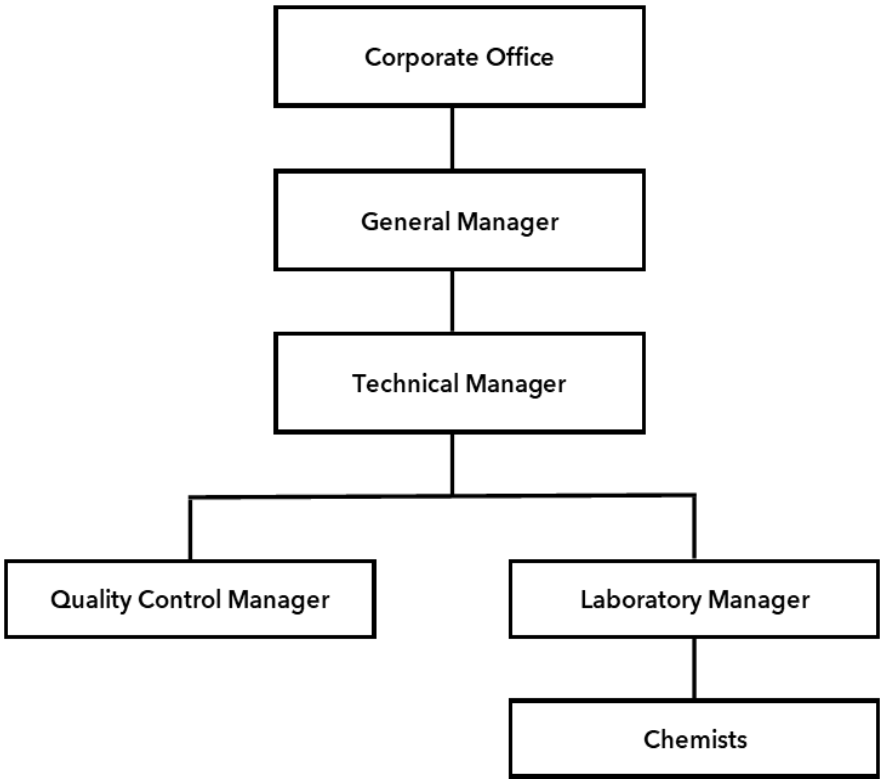

Figure 2-1. Laboratory reporting structure.

Note: CHGM may use personnel from another facility to fulfill any of the positions listed above. For example, the Technical Manager, Lab Manager and QC Manager may be Clean Harbors employees from other locations that function in the same capacities. Depending on the operations being performed at CHGM, only the General Manager, Lab Manager and QC positions must be filled to maintain an operating laboratory, and the Lab Manager must be stationed at CHGM.

2.1. QUALITY CONTROL MANAGER

The QC Manager is responsible for identifying quality problems, recommending solutions, and verifying that the solutions are implemented. QC Manager duties include all the following:

- Developing mechanisms to carry out QA/QC objectives
- Administering QC procedures
- Implementing corrective action(s)
- Maintaining QA/QC records

2.2. LABORATORY MANAGER

The Laboratory Manager is responsible for the daily operation and management of the laboratory. The manager's duties include all the following:

- Managing laboratory personnel
- Overseeing and coordinating instrument and equipment maintenance
- Reviewing work procedures and daily laboratory practices
- Work scheduling
- Record keeping
- Training of laboratory personnel
- Administering laboratory QC

2.3. LABORATORY SUPERVISOR

The Laboratory Supervisor oversees the daily operation and management of the laboratory. The supervisor's duties include all the following:

- Managing chemists and technicians
- Overseeing and coordinating instrument and equipment maintenance
- Reviewing work procedures and daily laboratory practices
- Work scheduling
- Record keeping
- Training of laboratory personnel
- Administering laboratory QC

2.4. CHEMISTS

The Chemist's duties are as follows:

- Making recommendations for technical decisions
- Evaluating and reviewing test procedures
- Reviewing and signing laboratory reports
- Ensuring that results are accurate and reproducible
- Calculating and interpreting test results
- Calibrating and operating equipment and instruments
- Preparing and analyzing samples

2.5. LABORATORY TECHNICIANS

The laboratory technicians duties are as follows:

- Performing sample preparations and analysis
- Maintaining a clean and safe working environment
- Making recommendations to supervisors regarding analysis or QA/QC performance
- Performing QA/QC analysis
- Reviewing and signing laboratory reports

2.6. SAMPLING TECHNICIANS

Sampling technicians are responsible for sampling containers, vessels, tanks, and process streams. They may be chemists, engineers, laboratory technicians, or operations personnel. They have specialized training in sampling techniques, including the use of various sampling apparatus, sample site selection, sampling methodologies, and chain of custody procedures.

The CHGM Manager or designee interacts with the sampling technicians to assure understanding of selection, collection, storage, transportation, and documentation practices (Figure 2.1).

3.0 QUALITY ASSURANCE OBJECTIVES

QA objectives for measurement are defined as follows:

- Precision – is the measure of agreement among a set of replicate results. Precision is assessed using duplicate/replicate sample analysis.
- Accuracy – is the nearness of a result, or the mean (X) of a set of results, to the true value or an established laboratory mean. Accuracy is assessed using reference samples and % recoveries.
- Completeness – is the measure of the amount of valid data derived from a system of measurement as compared to the amount of data that was expected to result from the system of measurement.

3.1. ACCURACY

Using one or more of the following techniques generates accuracy information for quantitative measurements:

3.1.1. Calibration Checks

Calibration checks determine the acceptability of a calibration. The limits are method specified.

Calibration Check Standards are used as continuing checks for organic analysis. The equation for the Calibration Check Standard is:

% Recovery = 100 (result/true value)

Calibration Verification Standards (CVS) are second-source standards (a different lot from those used for generating a calibration curve) to check the accuracy of the calibration curve. The equation for the CVS is:

% Recovery = 100 (result/true value)

3.1.2. Method Accuracy Checks

Method Accuracy checks determine the acceptability of a batch of samples that have been subjected to a preparation step (i.e., digestion, extraction, combustion, etc.). The limits are method specified or statistically generated. The means and limits are tracked by generating statistical data. Statistically generated data must also meet the method-specified range, if there is one, to be used to demonstrate method accuracy. If the Method Accuracy check does not fall within the control limit, the batch is rejected and rerun for the failed constituent(s).

Control Limit = method / QAP specified

or

mean $\pm$3sd

Laboratory Control Sample or Blank Spike (LCS) consists of an aliquot of clean (control) matrix and is the same weight or volume as the sample matrix. The LCS is spiked with the same analytes at the same concentrations as the matrix spike. When the results of the matrix spike analysis indicate a potential problem due to the sample matrix itself, the LCS results are used to verify that the laboratory can perform the analysis in a clean matrix, thus validating the laboratory's analytical process.

Control Blank Spikes are blanks that are spiked with the constituents being analyzed.

3.1.3. Matrix Accuracy Checks

Matrix Spikes (MS) are samples that are spiked with the constituents being analyzed. They are only used as method accuracy checks when the matrix has demonstrated a lack of interference in the analysis.

% Matrix Spike Recovery = 100(Sample Spike Result-Sample Amount)/Spike Amount

3.2. PRECISION

Performing a Matrix Duplicate or a Matrix Spike Duplicate generates precision information for quantitative measurements. The results of the duplication are compared to the initial accuracy check. The limits are method specified or statistically generated. As appropriate, the means and limits are tracked by generating statistical data. Statistically generated data must also meet the method specified control limit, if there is one, to be used to demonstrate precision. All precision outliers must be explained in the permanent laboratory record.

Control Limit = Method / QAP specified

or

Upper Control Limit

LCS Duplicates or *Control Blank Spike Duplicates* are analyzed by the same procedure as the initial method accuracy check.

Matrix Spike Duplicates (MSD) are samples spiked with the constituents being analyzed. They are only used as precision checks when the matrix has demonstrated a lack of interference in the analysis.

Method Specified Limits for precision are compared to results generated by either:

Relative Percent Difference = 100(Range of Results/Average of Results)

or

Coefficient of Variation = 100(standard deviation/mean)

Upper Control Range Limits are generated by historical statistical techniques.

Upper Control Range Limit = Mean of Ranges x (D_2/d_2)

where:

Range = absolute difference between replicates

D_2 = 99% confidence upper limit (equivalent to ±3sd) on a population mean of replicate averages (when n=2, D_2=3.686).

d_2 = factor that converts a range into a standard deviation between replicates (when n=2, d_2=1.128). Source of D_2 and d_2: ASTM Manual, *Quality Control of Materials.*

3.3. METHOD PREPARATION CHECKS

Objectives and limits for accuracy, precision, and method preparation are detailed in Table 3.1. When a method preparation check is outside the prescribed limits, a notation (flag), is documented in the final report.

3.3.1. Matrix Spikes

Samples that are spiked with the constituents being analyzed. The results are compared to method specified limits or statistically generated limits to determine preparation efficiency.

3.3.2. Matrix Spike Duplicates

The same as Matrix Spikes. The results are compared to the initial Matrix Spike result to determine the precision of preparation efficiency.

3.3.3. Surrogates

Surrogates are constituents that are not commonly found in the natural environment or in commercial waste products. In organic chromatographic analysis, they are clearly distinguishable from target compounds and are somewhat less susceptible to inferences. They are added to the sample at the beginning of the preparation step and are used as an additional determination of preparation efficiency.

3.3.4. Surrogate Recovery

The strategy used for evaluating surrogate recovery is as follows:

If the surrogate recovery falls outside the $\pm$3 standard deviation (SD) limits, and review of the chromatography does not indicate matrix interference, the analyst must perform either step 1 or step 2 below:

1) Rerun the extract.

   (a) If the result is within $\pm$3 sd, the analysis is finished.
   (b) If the result is still outside the limits, the sample must be re-extracted once and rerun on the instrument.

      i. If the result is within $\pm$3 sd, the analysis is finished.
      ii. If it continues to fall outside the SD limits, the analysis is finished, and the final report must be flagged (matrix interference can be assumed).

2) Re-extract the sample and rerun it on the instrument.

   (a) If the result is within $\pm$3 sd, the analysis is finished.
   (b) If it continues to fall outside the SD limits, the analysis is finished, and the final report must be flagged (matrix interference can be assumed).

3.4. DATA COMPLETENESS

A data package is considered complete when the following applicable items are finished:

- All appropriate logbooks contain all essential information.
- Data validation has been performed.
- Data files contain raw data, completed data validation forms, and all worksheets that document acceptable accuracy, and precision.
- Results are placed into the laboratory record, the corporate LIMS system, or paper records.

TABLE 3.1: ACCURACY, PRECISION, METHOD PREPARATION - ACRONYMS

AA	Atomic absorption
BFB	4-bromofluoro-benzene
CCC	Calibration check compounds
CVS	Calibration verification standard
DFTPP	Decafluorotriphenylphosphine
EICP	Extracted ion current profile
GC	Gas chromatography
GC/MS	Gas chromatography/mass spectrometry
HPLC	High performance liquid chromatography
ICP	Inductively coupled plasma
IDL	Instrument detection limit
ICP/MS	Inductively coupled plasma – mass spectrometry
LCS	Laboratory control sample/blank spike
MS	Matrix spike
MSD	Matrix spike duplicate
RF	Response factor
RPD	Relative percent difference
RRF	Relative response factor
RSD	Relative standard deviation
SD	Standard deviation
SPCC	System performance check compounds
TCLP	Toxicity characteristic leaching procedure

TABLE 3.1: ACCURACY, PRECISION, METHOD PREPARATION: OBJECTIVES AND LIMITS

*ICP Metals, AA Metals, Hg (CVAA), Cyanide, Reactive Sulfide

Analysis	Calibration Checks	Limits	Method Accuracy Checks	Limits	Method Precision Checks	Limits	Method Preparation Check (Efficiency)	Limits	Method Preparation Check (Precision)	Limits
ICP Metals (Totals and TCLP)	Calibration Verification Standard	90-110%	Control Blank Spike	75-125%	NA	NA	MS	75 – 125%	MSD	RPD <20
	Continuing Calibration Blanks	<3 IDL or avg of 2 or more repeated results <3 SD of background mean					Post-Digestion Spike	75 – 125%		
	Interelement Interference	As specified by method					TCLP Matrix Spike	50%		
AA Metals	Calibration Verification Standard	90-110%	Control Blank Spike (after initial)	80-120%	NA	NA	MS	80-120%	MSD	RPD <20
Hg	Calibration Verification Standard	90-110%	Control Blank Spike (after initial)	80-120%	NA	NA	MS TCLP MS	80-120%>50%[1]	MSD	RPD <20
Reactive Sulfide	NA	NA	Control standard	75-125%	NA	NA	NA	NA	Sample Duplicate	<20% RPD
Cyanide	High and Low Calibration Verification Standards	Titrametric–N/A Colorometric – 85-115%	Control Blank Spike	85-115%	NA	NA	MS	85-115%	Sample Duplicate	<20% RPD

[1] Perform Method of Standard Additions when (1) the recovery of the spike TCLP extract is <50% and the unspiked extract does not exceed the regulatory level, or (2) the concentration of the metal in the extract is within 20% of the appropriate regulatory level.

TABLE 3.1 (Cont.): ACCURACY, PRECISION, METHOD PREPARATION: OBJECTIVES AND LIMITS - GC/MS VOLATILES

Analysis	Calibration Checks	Limits	Method Accuracy Checks	Limits	Method Precision Checks	Limits	Method Preparation Check (Efficiency)	Limits	Method Preparation Check (Precision)	Limits
GC/MS Volatiles	Initial BFB Tuning	Per Table 4, (8260)	Control Blank Spike (5 MS Compounds)	±3 SD	Control Blank Spike Duplicate	<Upper Range Limit	MS (5 MS Compounds)	±3 SD	MSD	< Upper Range Limit
	CCC	RF RSD <30	OR		OR		Surrogates (3)		N/A	N/A
	SPCC	Min RRF 0.10 (0.30 for CBZ, Tet CF)	MS (5 MS Compounds)	±3 SD	MSD	<Upper Range Limit		±3 SD		
	Daily SPCC	0.10 (0.30 for CBZ, Tet CF)								
	CCC	< 25% difference from initial								
	Internal Standard EICP	As required by 8260								

TABLE 3.1 (Cont.): ACCURACY, PRECISION, METHOD PREPARATION: OBJECTIVES AND LIMITS – GC/MS SEMIVOLATILES

Analysis	Calibration Checks	Limits	Method Accuracy Checks	Limits	Method Precision Checks	Limits	Method Preparation Check (Efficiency)	Limits	Method Preparation Check (Precision)	Limits
GC/MS Semi-volatiles	Initial DFTPP Tuning	Per Table 3 (8270A)	Control Blank Spike (11 MS Compounds)	±3 SD	Control Blank Spike Duplicate	Upper Range Limit	MS (11 MS Compounds)	±3 SD	MSD	< Upper Range Limit
			OR		OR					
	CCC	RF SD < 30					Surrogates (6)	±3 SD	N/A	N/A
	SPCC	Min RRF 0.050	MS (11 MS Compounds)	±3 SD	MSD	<Upper Range Limit				
	Daily SPCC	Min RRF 0.050								
	CCC	< 30% difference from initial								
	Internal Standard EICP	As required by 8270								

TABLE 3.1 (Cont.): ACCURACY, PRECISION, METHOD PREPARATION: OBJECTIVES AND LIMITS – PESTICIDES, PCBs, HOMOLOGS

Analysis	Calibration Checks	Limits	Method Accuracy Checks	Limits	Method Precision Checks	Limits	Method Preparation Check (Efficiency)	Limits	Method Preparation Check (Precision)	Limits
Pesticides	Initial Calibration Factor (External Standard Method)	RSD < 20	Control Blank Spike (6 MS Compounds)	±3sd	Control Blank Spike Duplicate	<Upper Range Limit	MS (6 MS Compounds)	±3 SD	MSD	<Upper Range Limit
			OR		OR					
	RF (Internal Standard Method)	RSD < 20	MS (6 MS Compounds)	±3 SD	MSD	<Upper Range Limit	Surrogates	±3 SD	N/A	N/A
	4,4'-DDT and Endrin Breakdown	< 15%								
	Daily CCC	85 – 115% (or average of 85 – 115%)								
PCBs	Initial Calibration Factor (External Standard Method)	RSD < 20	Laboratory Control Sample	±3 SD	Laboratory Control Sample Duplicate	<Upper Range Limit	MS	±3 SD	MSD	<Upper Range Limit
		OR	OR		OR					
	Daily CCC		MS	±3 SD	MSD	<Upper Range Limit	Surrogates	±3 SD	N/A	N/A

TABLE 3.1 (Cont.): ACCURACY, PRECISION, METHOD PREPARATION: OBJECTIVES AND LIMITS -HERBICIDES, METHANOL

Analysis	Calibration Checks	Limits	Method Accuracy Checks	Limits	Method Precision Checks	Limits	Method Preparation Check (Efficiency)	Limits	Method Preparation Check (Precision)	Limits
Herbicides	Initial									
	Calibration Factor (External Standard Method)	RSD < 20	Control Blank Spike (3 MS Compounds)	±3 SD	Control Blank Spike Duplicate	<Upper Range Limit	Matrix Spike (3 MS Compounds)	±3 SD	Matrix Spike Duplicates	<Upper Range Limit
			OR		OR					
	Daily									
	Continuing Calibration Compounds	85 – 115%	Matrix Spike (3 MS Compounds)	±3 SD	Matrix Spike Duplicate	<Upper Range Limit	Surrogates	±3 SD	N/A	N/A
Methanol & Other GC Volatiles	Initial									
	Calibration Factor (External Standard Method)	RSD < 20	Control Blank Spike	±3 SD	Control Blank Spike Duplicate	<Upper Range Limit	Matrix Spike	±3 SD	Matrix Spike Duplicates	<Upper Range Limit
	Daily		OR		OR					
	Continuing Calibration Compounds	85 – 115%	Matrix Spike	±3 SD	Matrix Spike Duplicate	<Upper Range Limit	Surrogates	±3 SD	N/A	N/A

TABLE 3.1 (Cont.): ACCURACY, PRECISION, METHOD PREPARATION: OBJECTIVES AND LIMITS – DIOXINS/FURANS (LOW RESOLUTION)

Analysis	Calibration Checks	Limits	Method Accuracy Checks	Limits	Method Precision Checks	Limits	Method Preparation Check (Efficiency)	Limits	Method Preparation Check (Precision)	Limits
Dioxins/Furans (Low Resolution)	Initial									
	Relative Response Factor	RSD < 15 Triplicate injections of each level.	N/A	N/A	N/A	N/A	Internal to Recovery Standard	40 – 120%	N/A	N/A
	Initial Tuning									
	Isotopic Ratio Measurements w/ Column Performance Check Mixture	As per 8280 Table 3								
	Valley Percent Resolution for 2,3,7,8-TCDD and 1,2,3,4-TCDD	< 25								
	Daily/Continuing									
	Mid-level Check Standard	± 30% of the Initial Calibration RRFs								
	Daily Tuning									
	Same as Initial Tuning	Same as Initial Tuning								

TABLE 3.1 (Cont.): ACCURACY, PRECISION, METHOD PREPARATION: OBJECTIVES AND LIMITS – DIOXINS/FURANS (HIGH RESOLUTION)

Analysis	Calibration Checks	Limits	Method Accuracy Checks	Limits	Method Precision Checks	Limits	Method Preparation Check (Efficiency)	Limits	Method Preparation Check (Precision)	Limits
	Initial									
Dioxins/Furans (High Resolution)	Relative Response Factor 17 unlabeled 9 labeled	RSD < 20 RSD < 30	N/A	N/A	N/A	N/A	Internal to Recovery Standard	40 – 135%	Matrix Spikes and Matrix Spike Duplicates	RPD <20 RPD <25
	Initial Tuning									
	Isotopic Ratio Measurements for 17 unlabeled 11 labeled	As per 8290 Table 8 <25							Unspiked Duplicates	
	Isotopic Ratio Measurements for Column Performance Check Standard	<10								
	Valley Percent Resolution [PFK] m/z 304.09824 & TCDF m/z 303.9016	±20% ±30% of the Initial Calibration RRFs								
	Daily/Continuing									
	High Resolution Calibration Compound-3 17 unlabeled 9 labeled	Same as Initial Tuning RPD <25 RPD <35 of the previous 12-hour HRCC-3 Check								
	Daily Tuning									
	Same as Initial Tuning									
	End Cal Check									
	HRCC-3 17 Unlabeled 9 labeled									

TABLE 3.1 (Cont.): ACCURACY, PRECISION, METHOD PREPARATION: OBJECTIVES AND LIMITS – WET CHEMISTRY

Analysis	Calibration Checks	Limits	Method Accuracy Checks	Limits	Method Precision Checks	Limits	Method Preparation Check (Efficiency)	Limits	Method Preparation Check (Precision)	Limits
Heat of Combustion (BTU)	Initial									
	Generate an EE value with 6 runs of benzoic acid on two non-consecutive days	Results must be within 56 BTU/lb of each other	Laboratory Control Sample	+200 BTU/lb or +3 SD of historical mean (use the more stringent)	Laboratory Control Sample Duplicate	Within 56 BTU/lb of initial LCS run or <upper Range Limit (use the more stringent)	N/A	N/A	N/A	N/A
	Daily									
	Benzoic Acid	11373 BTU/lb +56								
Chloride (for Total Halogens)	Calibration Verification Standard	90-110%	Laboratory Control Sample	±3 SD of historical mean	Laboratory Control Sample Duplicate	<Upper Range Limit	Matrix Spike	±3 SD	Matrix Spike Duplicates	<Upper Range Limit
Ignitability: Setaflash	n-Butanol	98°F ±2	Select a compound with a flashpoint near 140°F	Pass/Fail	N/A	N/A	N/A	N/A	N/A	N/A
	OR									
	p-Xylene	81°F ±2								
	OR									
	n-Hexanol	145°F ±10								
Ignitability: Pensky-Marten	p-Xylene	81°F ±2	Select a compound with a flashpoint near 140°F	Pass/Fail	N/A	N/A	N/A	N/A	N/A	N/A
	OR									
	n-Butanol	98°F ±2								
	OR									
	n-Hexanol	145°F ±10								
Percent Moisture: Evaporation	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Duplicate	RPD < 10
Percent Moisture: Karl Fischer	Hydranal	90-110%	N/A	N/A	N/A	N/A	N/A	N/A	Duplicate	RPD < 10

Analysis	Calibration Checks	Limits	Method Accuracy Checks	Limits	Method Precision Checks	Limits	Method Preparation Check (Efficiency)	Limits	Method Preparation Check (Precision)	Limits
Percent Ash	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Duplicate	RPD < 10
Fluoride (from Combustate)	Calibration Verification Standard	90 – 110%	Laboratory	±3 SD of historical mean	Laboratory Control Sample Duplicate	<Upper Range Limit	Matrix Spike	±3 SD	Matrix Spike Duplicates	<Upper Range Limit
Viscosity	Calibration Verification Standard	90-110%	N/A	N/A	N/A	N/A	N/A	N/A	Duplicate	RPD <10
Specific Gravity / Bulk Density	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Duplicate	RPD <10
pH: Water	pH Buffers appropriate for waste being tested	N/A	Calibration Verification Standard	+0.1 pH Units	N/A	N/A	N/A	N/A	Duplicates on all water samples	±0.1 pH Units
pH: Paper Screen	Check each lot against NIST traceable buffer	± 1 color increment	N/A	N/A	N/A	N/A	N/A	N/A	Duplicate per batch	± 1 color increment
pH: Paper	Check each lot against NIST traceable buffer	± 1 color increment	N/A	N/A	N/A	N/A	N/A	N/A	Duplicate on all samples	±1 color increment on narrow range paper
pH: Waste	pH Buffers appropriate for waste being tested	N/A	Calibration Verification Standard	±0.1 pH Units	N/A	N/A	N/A	N/A	Duplicate per batch	±0.1 pH Units
pH: Solids	pH Buffers appropriate for waste being tested	N/A	Calibration Verification Standard	±0.1 pH Units	N/A	N/A	N/A	N/A	Duplicate per batch	±0.1 pH Units

4.0 SAMPLING PROCEDURES

A comprehensive waste sampling program is essential to ensure that all samples collected are appropriate for the analysis being performed, that the analysis is complete and accurate, and that the final reports contain sufficient information to achieve their intended purpose. The purpose of sampling waste is the safe and efficient treatment and disposal of hazardous waste.

Waste samples do not require preservation but are subject to holding times. The analytical methods included in this QAP refer to the optimum means of preservation. Since the chemical make-up of certain samples can alter the effectiveness of sample preservation measures, all samples are analyzed as soon as possible after sampling and before the maximum recommended holding time is exceeded.

Table 4.1 indicates the parameter of interest, appropriate container, preservation, and maximum holding times for samples of various matrix types. A copy of this table may be sent to generators to assist them in properly preserving the integrity of samples sent to laboratories for analysis.

4.1. SAMPLE COLLECTION

Sampling may be representative, composite, grab or surface area depending on sample strategy. The methods and equipment used for sampling waste material vary with the form and consistency of the waste, and by the type and purpose of the analysis.

Detailed sampling methods for small containers, bulk containers, tanks, and frozen waste are described in section 4.6.2 through 4.6.5 of the main body of the WAP.

The following sampling procedures may be utilized for the following types of materials:

Extremely viscous liquids	ASTM D140 SW846
Crushed or powdered material	ASTM D346 SW846
Soil or rock-like material	ASTM D420 SW846
Soil-like material	ASTM 1452 SW846
Fly-ash-like material	ASTM D2234 SW846
Stratified liquids	EPA-600/2-80-018 SW846

Table 4.1: SAMPLING CONTAINERS, PRESERVATION, AND HOLDING TIMES

MATRIX	ANALYSIS	CONTAINER	PRESERVATION [1]	MAXIMUM HOLDING TIME
Solids, Organic Liquids, Sludges	Semi-Volatile Organics	Glass	4°C	Extraction: 14 Days Extract: 40 Days
	Volatile Organics	VOA Vial / (Glass)[2]	4°C	14 Days
	ICP Metals	Glass, Plastic	4°C	6 Months
	Mercury	Glass, Plastic	4°C	Extraction: 28 Days Extract: 28 Days
	Cyanide	Glass, Plastic	4°C	14 Days
	Wet Chemistry and Fingerprint	Glass, Plastic	4°C	6 months
Aqueous Liquids	Semi-Volatile Organics	Glass	4°C	Extraction: 7 Days Extract: 40 Days
	Volatile Organics	VOA Vial / (Glass)[2]	4°C	14 Days 7 days without a preservative
	ICP Metals	Glass, Plastic	4°C, HNO_3 to pH<2	6 Months
	Mercury	Glass, Plastic	4°C, $HNO_3$to pH<2	28 Days w/Glass 13 Days w/Plastic
	Cyanide	Glass, Plastic	4°C, NaOH to pH>12	14 Days
	Wet Chemistry and Fingerprint	Glass, Plastic	4°C	6 months

NOTES

1. Hazardous Waste Samples Require No Preservation (Sources: SW-846 Volume II, Chapter 9, Page NINE-71, Paragraph 5., and Paul White, USEPA Method and Information Exchange (703) 676-4690.)
2. Glass for Hazardous Waste samples only.

4.2. SAMPLING SURFACES FOR PCBS

The 40 C.F.R. § 761.123 contains standardized EPA procedures for collecting PCB surface wipe samples. The definition constitutes the minimum requirements for an appropriate wipe testing protocol. A standard size template (10 cm X 10 cm) is used to identify the sampling area; the wiping media is an all-collection gauze pad which has been saturated with hexane. The wipe is performed quickly once the gauze is exposed to air.

4.3. SAMPLING FOR SITE GENERATED WASTE

See Section 5.0 of the main body of the Waste Analysis Plan.

5.0 TRACEABILITY

CHGM routinely follows sample traceability for all internal sampling and analysis. This involves the documentation of procedures so that a set of data can be traced back through the analyst, to the person performing the sampling, and then to the waste itself. All samples receive a unique sample identification number to facilitate this process.

To trace sample possession from the time of collection, a traceability record containing the following information is completed and accompanies the sample:

- Sample ID
- Signature of the collector
- Date collected
- Waste type
- Signature of people involved
- Inclusive date of possession
- Cross reference to manifest (if applicable)

5.1. SAMPLE LABELS

Sample labels are necessary to prevent misidentification of samples. The labels are gummed and affixed to the containers prior to or at the time of sampling. The labels are filled out at the time of collection.

5.2. SAMPLE SEALS

Sample seals are used to detect any tampering during shipment for samples sent off site. The seals are initialed, dated, and then affixed to the sample containers or shipping containers before the samples leave the custody of the lab. Sample seals are not necessary for samples taken onsite at CHGM and sent to the onsite laboratory or if being transported by CHGM personnel or the personnel from the laboratory that is going to perform the analysis. They are required for Chain-of-Custody events where CHGM personnel are not transporting the samples.

5.3. SAMPLING RECORD

All information pertinent to field surveys or sampling is recorded in the operating record. Since sampling situations vary widely, no set of rules can be given as to the extent of information that must be entered in the operating record. However, sufficient information is recorded to allow someone to reconstruct the sampling without reliance on the collector's memory. This record includes at a minimum the following information:

- Location of sampling point
- Volume of samples taken
- Date of collection
- Sample identification number
- Person sampling
- Comments or observations
- Sampling methodology

5.4. CHAIN OF CUSTODY

Chain-of-custody is used when shipping samples off-site and is maintained as required by the client or regulatory agency. A chain-of-custody is used to ensure the data from sample collection to data reporting is legally defensible. This includes the ability to trace the possession and handling of samples from the time of collection through analysis and final disposition.

The components of the chain-of-custody include the following: sample seals, a log, and chain-of-custody record. The procedures for their use are described in further detail.

A sample is considered under a person's custody if any of the following apply:

- It is in a person's physical possession.
- It is in view of the person after possession has taken place.
- It is secured by that person so that undetected tampering with the sample cannot occur.
- It is secured by that person in an area which is restricted to authorized personnel.

Once the lab receives the sample(s) they are entered into the sample receipt log. All chain-of-custody samples are directed to the sample custodian. The shipping containers and sample bottles are inspected for proper seals and labels. The contents of the containers are then checked against the chain-of-custody record.

The chain-of-custody record must include but is not limited to the following:

- Sampler Signature
- Date Sampled
- Sample ID
- Type of sample (composite or grab)
- Number of Containers
- A place for comments
- Blocks for the person relinquishing the sample to sign, print their name, and put the date and time the sample was relinquished.
- Blocks for the person receiving the sample to sign, print their name, and put the date and time the sample was received.

If the chain-of-custody information is complete and the integrity of the sample(s) has not been broken, each sample is assigned a unique identification number. If the information on the chain-of-custody record is not complete, the sample custodian shall contact the appropriate facility personnel to obtain the missing information. Once the missing information is received, a unique identification number is assigned. All problem resolutions will be documented in the sample receipt log.

The samples are then put into storage to await analysis. Maximum holding times for the samples are described in Section 6 of this Quality Assurance Plan.

6.0 CALIBRATION PROCEDURES AND FREQUENCIES

All instruments are calibrated in accordance with the appropriate analytical method. Common QC methods are referenced in Section 9.0. These methods cite the appropriate calibration procedures and frequencies. In addition, all instruments are calibrated in accordance with the manufacturer's procedures.

Prior to analyzing samples, instruments are either calibrated or their calibrations verified. Calibration curves of signal response versus concentration are generated on each applicable analytical instrument.

Calibrations are evaluated using calibration check standards. Should this sample fall outside of acceptable limits as specified by the method, the instrument is recalibrated. Table 6.1 summarizes instrument calibration procedures and frequencies.

Sources of reference materials include the National Bureau of Standards and reputable commercial vendors. PCB reference materials will be obtained from EPA's reference laboratory or from a suitable chemical supply firm.

TABLE 6.1: SUMMARY OF CALIBRATION PROCEDURES AND FREQUENCIES		
Instrument	**Standards**	**Frequency**
GC	Mid-level Standard	Daily and every 10^{th} sample.
	5-7 Standards	Recalibration if CVS is greater than 15% of expected value.
GC/MS	Mid-level Standard	Daily
	5-7 Standards	Recalibration if continuing calibration check (CCC) is greater than 30% for semi-volatiles and 25% for volatiles.
	Mass Calibration (GC/MS tuning)	Every 12 hours.
ICP	Calibration Verification Standard (CVS)	Beginning and end of analytical run and every 10^{th} sample.
	3-5 Standards	Recalibration if CVS not within $\pm$ 10% of expected value.
AAS	3-5 Standards	Analysis of standards at the beginning of an analytical run.

7.0 ANALYTICAL METHODS

The analytical methods for waste verification are listed in Section 6.0 of this WAP.

8.0 DATA REDUCTION, VALIDATION, AND REPORTING

Data reduction procedures include several levels of data review. Data validation begins with the person generating data: the chemist or analyst makes the initial calculations and records the results. Each section supervisor or designee revies the data and 10% of the hand calculations generated by their group. Discrepancies and/or errors are corrected or sent back to the chemist or analyst performing the analysis. If necessary, the samples are reprepared and reanalyzed.

Figure 8.1 depicts the data reduction, validation, and reporting process.

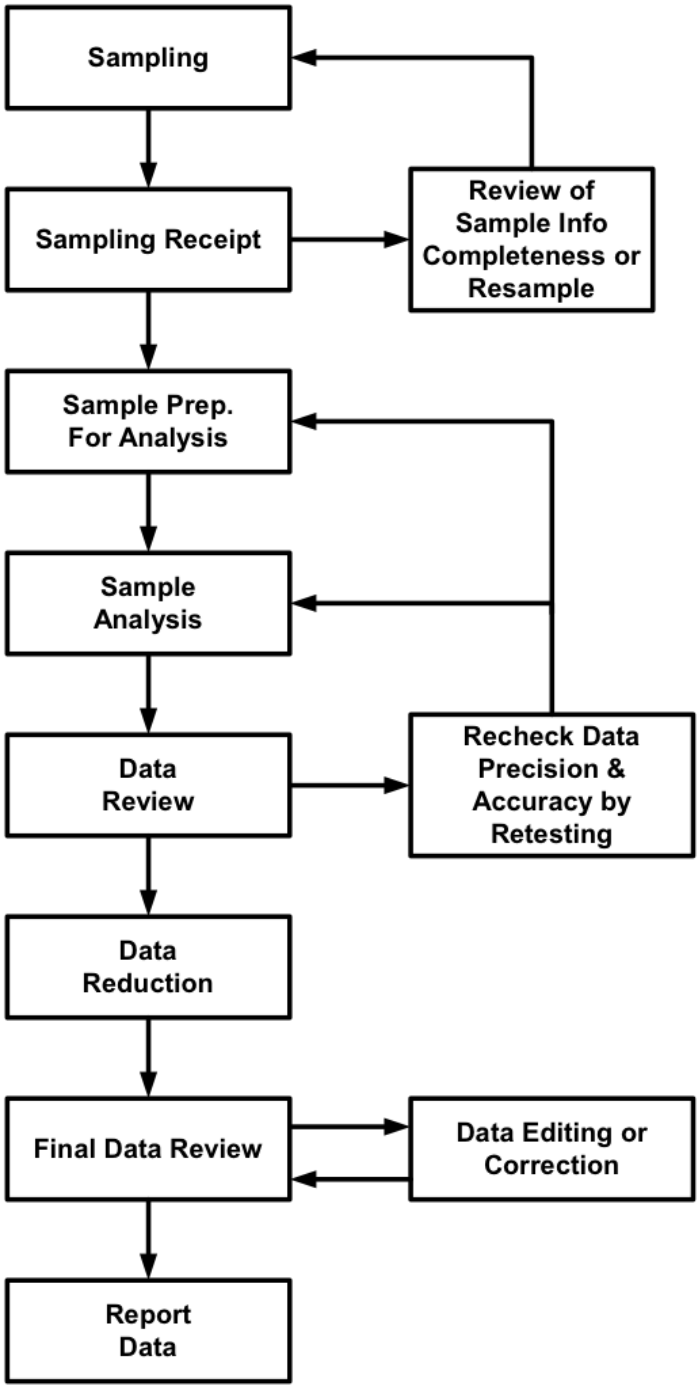

Figure 8-1. Data Reporting.

8.1. DATA REDUCTION

Raw data from chromatographs, spectrometers, recorders, and physical measurements are reduced to yield concentrations of the analytes of interest. All data reduction is performed in accordance with the applicable method as referenced in section 9.0.

Data reduction is recorded in ink on worksheets or in lab notebooks. It is not computerized.

8.2. DATA VALIDATION

All data are validated and reviewed for both editorial and technical validity.

The editorial review consists of a check for transpositional, transcription, omission, and other written errors. This review also includes a review of any text which may accompany the data.

The technical review consists of a check to see that all precision, accuracy, and detection limit requirements have been met. In addition, the data are reviewed for completeness and representativeness.

8.3. DATA REPORTING

Once the data have been reviewed and all requirements for completeness, representativeness, precision, accuracy, and detection limits have been met, CHGM reports the results to the client.

Typically, only the final reduced data is reported. All QC data, calculations, chromatograms, etc., that support the reported data are retained in the laboratory records.

9.0 INTERNAL QUALITY CONTROL CHECKS

A minimum level of quality control is maintained as described in SW-846 Chapter 1 "Quality Control."

Table 3.1 describes the quality control strategies for each analysis. A glossary of terms is in Section 9.2.

9.1. FIELD QUALITY CONTROL

The procedures that are used in the field to ensure data quality include:

- Using approved (EPA, DWMRC, Industry Standard) sampling techniques.
- Justifying and documenting any field action contrary to approved or specified techniques.
- Documenting activities such as container preparation, instrument calibration, etc.
- Documenting field measurement QC Data.
- Documenting field activities.

- Documenting post-field activities including sample shipment and receipt, equipment check-in, and de-briefing.
- Generating QC samples, including duplicates.

9.2. ANALYTICAL QUALITY CONTROL

The procedures used in the laboratory to ensure analytical data quality include:

Matrix Spike

Matrix spikes are aliquots of environmental samples to which known concentrations of certain target analytes have been added before sample preparation, cleanup, and determinative procedures have been implemented.

The matrix spike analysis is used to assess the performance of the method by measuring the effects of interferences caused by the sample matrix and reflects the bias of the method for the matrix in question.

Matrix Spike Duplicates

Matrix spike duplicates (MSDs) are additional replicates of matrix spike samples that are subjected to the sample preparation and analytical scheme as the original sample. A matrix spike duplicate sample would normally be included with each preparation batch of samples processed. Analysis of spiked duplicate samples ensures a positive value, allowing for estimation of analytical precision.

Matrix spike duplicates are used to document the precision as well as bias of a method in each sample matrix. When critical decisions are based on the matrix spike and matrix spike duplicate recoveries, the laboratory should maintain control charts for these samples to monitor precision and bias for each matrix.

MSDs are analyzed (when applicable) with every analytical batch or once in ten samples, whichever is more frequent. Spiked analytes are stipulated by the method, applicable regulations, or agreement with the client. Selection of the sample to be spiked and/or split depends on the information required and the variety of conditions within a typical matrix. In most cases, the laboratory will select the sample to be spiked. In some situations, requirements of the sample site dictate that the sampler selects a sample to be split and spiked based on a pre-visit evaluation or on-site inspection. This does not preclude the laboratory's spiking a sample of its own selection.

Blanks

Blanks are samples of analyte-free media that accompany each batch of samples through the entire analytical procedure.

Surrogate Standards

Surrogates are organic compounds that are similar to the target analytes in chemical composition and behavior in the analytical process but are not normally found in environmental samples. Surrogates are most used to monitor the performance of organic analyses. They are spiked into samples according to the procedures specified

in the relevant analytical method. Surrogate spike recoveries will fall within the control limits specified in the method.

Check Samples

Check samples are a representative subset of the analytes of interest that are used to evaluate equipment performance.

Clean-Ups

Clean ups are used to eliminate interferences in organic extracts. All associated QC samples must undergo the same procedures as field samples.

Column-Check Sample

Column-check samples are used to verify column performance. The elution pattern is reconfirmed after activating or de-activating a batch of absorbent.

Instrument Adjustment

Instrument adjustments are instrument and method specific. Analytical instruments are tuned and aligned according to the requirements for each instrument.

Calibration

Calibrations are performed according to the manufacturer's requirements and the procedures specified in the applicable method.

9.3. SPECIFIC REQUIREMENTS FOR INORGANIC ANALYSIS – STANDARD CURVES

Standard curves represent the relationship between two quantities and are used in the determination of inorganic analytes. They are prepared as follows:

- Standard curves are prepared for each analyte using data derived from one reagent blank and at least one additional concentration.
- The response for each prepared standard is based upon the average of three replicate readings of each standard.
- Sample results must fall within the concentration range of the standard curve.
- If the results of the verification are not within ±10% of the original standard curve for ICP and 10% of the original standard curve for Atomic Absorption, a reference standard is employed to determine if the discrepancy is with the standard or with the instrument.
- New standards are prepared on a quarterly basis.
- All data used in drawing or describing the curve are indicated on the curve or its description and a record is made of this verification.
- Standard deviations and relative standard deviations are calculated from the absolute recovery of analytes from the spike sample duplicates.

9.4. SPECIFIC REQUIREMENTS FOR ORGANIC ANALYSIS

The following requirements are applied to the analysis of samples by gas chromatography, liquid chromatography, and gas chromatography/mass spectrometry.

- The calibration of each instrument is verified at frequencies specified in the methods.
- Standard curves are prepared as specified in the methods.
- The tune of each GC/MS system used for the determination of organic analytes is checked with BFB for volatiles and with DFTPP for semi-volatiles. The required ion abundance criteria must be met before measuring any analytes.
- If the system does not meet the required specification for one or more of the required ions, the instrument is retuned and rechecked before proceeding with sample analysis. The tune performance check criteria are reviewed daily or for each 12-hour operation period, whichever is more frequent.
- The background subtraction is straightforward and designed only to eliminate column bleed or instrument background. Background subtractions resulting in spectral distortions for the sole purpose of meeting special requirements are contrary to the objectives of QA and are unacceptable.
- For determinations by high performance liquid chromatography or GC, the instrument calibration is verified as specified in the methods.

10.0 PROFICIENCY TESTING AND SYSTEM AUDITS

CHGM must conduct internal and external proficiency testing and system audits to monitor the capability and performance of the total measurement systems.

10.1. PROFICIENCY TESTING

The laboratory participates in blind round-robin tests with other laboratories that perform environmental analysis semi-annually. If round robins are available more frequently than semi-annually, participation is only required semi-annually. Proficiency testing helps management evaluate the precision and accuracy of its own laboratories, as well as providing information about the amount of inter-laboratory deviation that can be associated with a particular method. If the CHGM laboratory fails a proficiency testing audit, they will generate and implement a corrective action plan as described in Section 12 of this QAP.

For samples that are part of the certification process, the following rules apply:

1. The laboratory shall follow the proficiency testing provider's instructions for preparing the proficiency testing sample and shall analyze the proficiency testing sample as if it were a client sample.

2. The following are strictly prohibited:
    - Performing multiple analyses (replicates, duplicates) which are not normally performed during the analysis of routine samples.
    - Averaging the results of multiple analyses for reporting when not specifically required by the method.
    - Discussing the results of a proficiency testing audit with any other laboratory prior to the deadline to submit results to the proficiency testing provider.
    3. The laboratory shall maintain a copy of all proficiency testing records, including analytical worksheets.
    4. The Technical Manager of the laboratory shall sign and retain an attestation stating that the certified laboratory followed the proficiency testing provider's instructions for preparing the sample and that they analyzed it as if it were a client sample.
    5. The laboratory staff shall be trained on the proper handling of proficiency testing samples.

10.2. INTERNAL SYSTEM AND PERFORMANCE AUDITS

In the systems audit, all components of the measurement system are evaluated, including a careful evaluation of both field and laboratory quality control procedures. System audits are normally performed prior to or shortly after a new system has been implemented. Performance audits are then performed on a routine basis, at least semi-annually, during the lifetime or continuing operation of the system.

Internal performance audits are conducted on a semi-annual basis. The audits are completed by the QC Manager under the direction of the Facility Manager. The audit report is due to the Director 30 days following the conclusion of the audit.

The audit evaluates the system from the receipt of samples to the reporting of results. Specific areas that are addressed include: sample flow through the lab, sample storage, sample preparation, sample analysis, data reduction, data reporting, QC samples, logbooks, and raw data storage.

11.0 PREVANTATIVE MAINTENANCE

The laboratory is equipped and maintained to provide the best conditions possible for performing analysis. Equipment that has become obsolete by the advancement of technology is replaced or upgraded. All equipment is inspected daily to ensure that it is working properly.

Equipment is maintained according to the manufacturer's recommendations. All major pieces of equipment are covered by manufacturer service contracts. Whenever possible, CHGM maintains an inventory of spare parts that frequently need replacement such as septa, GC columns, ion volumes, torches, and regulators.

Table 11.1 lists pieces of equipment or components, the type of maintenance they require, and the frequency at which they are serviced.

TABLE 11.1: MAINTENANCE SCHEDULE

EQUIPMENT COMPONENT	MAINTENANCE PERFORMED	FREQUENCY
Gas Chromatograph		
Septa	Replace	As required
Column	Replace/condition	As required
Syringes	Replace	As required
Inlet liner (tube)	Clean/replace	As required
Electrolytic Conductivity Detector (ELCD) (HALL)	Leak check	As required
Ni catalyst	Replace/condition	As required
Solvent resin	Replace	As required
Electron Capture Detector	Wipe test	Semi-annually
	Leak check	As required
	Factory clean/recondition	As required
Photoionization Detector (PID)	Leak check	As required
Lamp	Replace	As required
Flame Ionization Detector (FID)	Leak check	As required
Jets	Clean	As required
Inductively Coupled Plasma (ICP)		
Nebulizer	Clean/replace	As required
Pump tubing	Replace	As required
Air filters	Clean	As required
Torch	Clean/replace	As required
Mercury Analyzer		
Drying tube desiccant	Replace	Daily
Sample tubing	Replace	Twice/week
Stannous chloride tubing	Replace	As required
Drain tubing	Replace	As required
Lamp	Replace	As required
Optics	Clean	As required
Calorimeter		
Bombs	Calibrate/certify	After 500 firings
Tubing	Check/replace	Daily

EQUIPMENT COMPONENT	MAINTENANCE PERFORMED	FREQUENCY
Compressed Gases		
Fittings	Leak checks	As required
Traps	Replace	As required

12.0 CORRECTIVE ACTION

QC procedures are designed to identify the need for corrective action. Most corrective actions are performed by the chemists doing the analysis and are usually as simple as recalibrating an instrument if the check sample is out of acceptable range. Most of the corrective actions come from the methods, standard operating manuals, and instrument manuals.

Corrective actions may also be initiated due to QA activities, including:

1. Performance audits
2. System audits
3. Laboratory or comparison studies
4. Program audits
5. Final review of data reports

The QA/QC Manager shall review the recorded corrective actions and ensure that they are implemented. The standard approach for corrective action consists of the following:

1. Defining the problem.
2. Determining the cause(s) of the problem.
3. Identifying possible solutions to the problem.
4. Implementing corrective action(s).
5. Verifying that the corrective action is effective.

All employees are encouraged to bring any problem or practice that they feel may affect data quality to their supervisor's attention.

13.0 QUALITY ASSURANCE REPORTS TO MANAGEMENT

The QC Manager reports to the Laboratory Manager on the performance of measurement systems and data quality. The Laboratory and Facility Manager each review and return the report to the QC Manager. These reports include:

1. Assessment of measurement data accuracy, precision, and completeness.
2. Results of performance audits.
3. Results of system audits.
4. Significant Quality Assurance problems and recommended solutions.

APPENDIX 2: APPROVED WASTE CODE LIST

	Module III (Containers)	Module IV (Tanks)	Module IV (Tanks)	Module VI (Landfills)
EPA Waste Code List	**May store these wastes**	**May store these wastes**	**May treat these wastes**	**May dispose these wastes**
	CONTAINERS	**STORAGE**	**STABILIZATION**	**LANDFILLS**
		TANKS	**TANKS**	
(See Note 1)	**(See Notes 2, 5)**	**(See Notes 2, 4, 5)**	**(See Notes 2, 4, 5)**	**(See Notes 3, 5)**
D001	D001	D001	D001	D001
D002	D002	D002	D002	D002
D003	D003	D003	D003	D003
D004	D004	D004	D004	D004
D005	D005	D005	D005	D005
D006	D006	D006	D006	D006
D007	D007	D007	D007	D007
D008	D008	D008	D008	D008
D009	D009	D009	D009	D009
D010	D010	D010	D010	D010
D011	D011	D011	D011	D011
D012	D012	D012	D012	D012
D013	D013	D013	D013	D013
D014	D014	D014	D014	D014
D015	D015	D015	D015	D015
D016	D016	D016	D016	D016
D017	D017	D017	D017	D017

	Module III (Containers)	Module IV (Tanks)	Module IV (Tanks)	Module VI (Landfills)
EPA Waste Code List	**May store these wastes**	**May store these wastes**	**May treat these wastes**	**May dispose these wastes**
D018	D018	D018	D018	D018
D019	D019	D019	D019	D019
D020	D020	D020	D020	D020
D021	D021	D021	D021	D021
D022	D022	D022	D022	D022
D023	D023	D023	D023	D023
D024	D024	D024	D024	D024
D025	D025	D025	D025	D025
D026	D026	D026	D026	D026
D027	D027	D027	D027	D027
D028	D028	D028	D028	D028
D029	D029	D029	D029	D029
D030	D030	D030	D030	D030
D031	D031	D031	D031	D031
D032	D032	D032	D032	D032
D033	D033	D033	D033	D033
D034	D034	D034	D034	D034
D035	D035	D035	D035	D035
D036	D036	D036	D036	D036
D037	D037	D037	D037	D037

	Module III (Containers)	Module IV (Tanks)	Module IV (Tanks)	Module VI (Landfills)
EPA Waste Code List	**May store these wastes**	**May store these wastes**	**May treat these wastes**	**May dispose these wastes**
D038	D038	D038	D038	D038
D039	D039	D039	D039	D039
D040	D040	D040	D040	D040
D041	D041	D041	D041	D041
D042	D042	D042	D042	D042
D043	D043	D043	D043	D043
F001	F001	F001	F001	F001
F002	F002	F002	F002	F002
F003	F003	F003	F003	F003
F004	F004	F004	F004	F004
F005	F005	F005	F005	F005
F006	F006	F006	F006	F006
F007	F007	F007	F007	F007
F008	F008	F008	F008	F008
F009	F009	F009	F009	F009
F010	F010	F010	F010	F010
F011	F011	F011	F011	F011
F012	F012	F012	F012	F012
F019	F019	F019	F019	F019
F020	F020	F020*	F020*	F020*

	Module III (Containers)	Module IV (Tanks)	Module IV (Tanks)	Module VI (Landfills)
EPA Waste Code List	**May store these wastes**	**May store these wastes**	**May treat these wastes**	**May dispose these wastes**
F021	F021	F021*	F021*	F021*
F022	F022	F022*	F022*	F022*
F023	F023	F023*	F023*	F023*
F024	F024	F024	F024	F024
F025	F025	F025	F025	F025*
F026	F026	F026*	F026*	F026*
F027	F027	F027*	F027*	F027*
F028	F028	F028*	F028*	F028*
F032	F032	F032	F032	F032
F034	F034	F034	F034	F034
F035	F035	F035	F035	F035
F037	F037	F037	F037	F037
F038	F038	F038	F038	F038
F039	F039	F039	F039	F039
NA	F999	F999	F999	F999
K001	K001	K001	K001	K001
K002	K002	K002	K002	K002
K003	K003	K003	K003	K003
K004	K004	K004	K004	K004
K005	K005	K005	K005	K005

	Module III (Containers)	Module IV (Tanks)	Module IV (Tanks)	Module VI (Landfills)
EPA Waste Code List	**May store these wastes**	**May store these wastes**	**May treat these wastes**	**May dispose these wastes**
K006	K006	K006	K006	K006
K007	K007	K007	K007	K007
K008	K008	K008	K008	K008
K009	K009	K009	K009	K009
K010	K010	K010	K010	K010
K011	K011	K011	K011	K011
K013	K013	K013	K013	K013
K014	K014	K014	K014	K014
K015	K015	K015	K015	K015
K016	K016	K016	K016	K016
K017	K017	K017	K017	K017
K018	K018	K018	K018	K018
K019	K019	K019	K019	K019
K020	K020	K020	K020	K020
K021	K021	K021	K021	K021
K022	K022	K022	K022	K022
K023	K023	K023	K023	K023
K024	K024	K024	K024	K024
K025	K025	K025	K025	K025
K026	K026	K026	K026	K026

	Module III (Containers)	Module IV (Tanks)	Module IV (Tanks)	Module VI (Landfills)
EPA Waste Code List	**May store these wastes**	**May store these wastes**	**May treat these wastes**	**May dispose these wastes**
K027	K027	K027	K027	K027
K028	K028	K028	K028	K028
K029	K029	K029	K029	K029
K030	K030	K030	K030	K030
K031	K031	K031	K031	K031
K032	K032	K032	K032	K032
K033	K033	K033	K033	K033
K034	K034	K034	K034	K034
K035	K035	K035	K035	K035
K036	K036	K036	K036	K036
K037	K037	K037	K037	K037
K038	K038	K038	K038	K038
K039	K039	K039	K039	K039
K040	K040	K040	K040	K040
K041	K041	K041	K041	K041
K042	K042	K042	K042	K042
K043	K043	K043	K043	K043
K044	K044	K044	K044	K044
K045	K045	K045	K045	K045
K046	K046	K046	K046	K046

	Module III (Containers)	Module IV (Tanks)	Module IV (Tanks)	Module VI (Landfills)
EPA Waste Code List	**May store these wastes**	**May store these wastes**	**May treat these wastes**	**May dispose these wastes**
K047	K047	K047	K047	K047
K048	K048	K048	K048	K048
K049	K049	K049	K049	K049
K050	K050	K050	K050	K050
K051	K051	K051	K051	K051
K052	K052	K052	K052	K052
K060	K060	K060	K060	K060
K061	K061	K061	K061	K061
K062	K062	K062	K062	K062
K069	K069	K069	K069	K069
K071	K071	K071	K071	K071
K073	K073	K073	K073	K073
K083	K083	K083	K083	K083
K084	K084	K084	K084	K084
K085	K085	K085	K085	K085
K086	K086	K086	K086	K086
K087	K087	K087	K087	K087
K088	K088	K088	K088	K088
K093	K093	K093	K093	K093
K094	K094	K094	K094	K094

	Module III (Containers)	Module IV (Tanks)	Module IV (Tanks)	Module VI (Landfills)
EPA Waste Code List	**May store these wastes**	**May store these wastes**	**May treat these wastes**	**May dispose these wastes**
K095	K095	K095	K095	K095
K096	K096	K096	K096	K096
K097	K097	K097	K097	K097
K098	K098	K098	K098	K098
K099	K099	K099	K099	K099
K100	K100	K100	K100	K100
K101	K101	K101	K101	K101
K102	K102	K102	K102	K102
K103	K103	K103	K103	K103
K104	K104	K104	K104	K104
K105	K105	K105	K105	K105
K106	K106	K106	K106	K106
K107	K107	K107	K107	K107
K108	K108	K108	K108	K108
K109	K109	K109	K109	K109
K110	K110	K110	K110	K110
K111	K111	K111	K111	K111
K112	K112	K112	K112	K112
K113	K113	K113	K113	K113
K114	K114	K114	K114	K114

	Module III (Containers)	Module IV (Tanks)	Module IV (Tanks)	Module VI (Landfills)
EPA Waste Code List	**May store these wastes**	**May store these wastes**	**May treat these wastes**	**May dispose these wastes**
K115	K115	K115	K115	K115
K116	K116	K116	K116	K116
K117	K117	K117	K117	K117
K118	K118	K118	K118	K118
K123	K123	K123	K123	K123
K124	K124	K124	K124	K124
K125	K125	K125	K125	K125
K126	K126	K126	K126	K126
K131	K131	K131	K131	K131
K132	K132	K132	K132	K132
K136	K136	K136	K136	K136
K140	K140	K140	K140	K140
K141	K141	K141	K141	K141
K142	K142	K142	K142	K142
K143	K143	K143	K143	K143
K144	K144	K144	K144	K144
K145	K145	K145	K145	K145
K147	K147	K147	K147	K147
K148	K148	K148	K148	K148
K149	K149	K149	K149	K149

	Module III (Containers)	Module IV (Tanks)	Module IV (Tanks)	Module VI (Landfills)
EPA Waste Code List	**May store these wastes**	**May store these wastes**	**May treat these wastes**	**May dispose these wastes**
K150	K150	K150	K150	K150
K151	K151	K151	K151	K151
K156	K156	K156	K156	K156
K157	K157	K157	K157	K157
K158	K158	K158	K158	K158
K159	K159	K159	K159	K159
K161	K161	K161	K161	K161
K169	K169	K169	K169	K169
K170	K170	K170	K170	K170
K171	K171	K171	K171	K171
K172	K172	K172	K172	K172
P001	P001	P001	P001	P001
P002	P002	P002	P002	P002
P003	P003	P003	P003	P003
P004	P004	P004	P004	P004
P005	P005	P005	P005	P005
P006	P006	P006	P006	P006
P007	P007	P007	P007	P007
P008	P008	P008	P008	P008
P009	P009	P009	P009	P009

	Module III (Containers)	Module IV (Tanks)	Module IV (Tanks)	Module VI (Landfills)
EPA Waste Code List	**May store these wastes**	**May store these wastes**	**May treat these wastes**	**May dispose these wastes**
P010	P010	P010	P010	P010
P011	P011	P011	P011	P011
P012	P012	P012	P012	P012
P013	P013	P013	P013	P013
P014	P014	P014	P014	P014
P015	P015	P015	P015	P015
P016	P016	P016	P016	P016
P017	P017	P017	P017	P017
P018	P018	P018	P018	P018
P020	P020	P020	P020	P020
P021	P021	P021	P021	P021
P022	P022	P022	P022	P022
P023	P023	P023	P023	P023
P024	P024	P024	P024	P024
P026	P026	P026	P026	P026
P027	P027	P027	P027	P027
P028	P028	P028	P028	P028
P029	P029	P029	P029	P029
P030	P030	P030	P030	P030
P031	P031	P031	P031	P031

	Module III (Containers)	Module IV (Tanks)	Module IV (Tanks)	Module VI (Landfills)
EPA Waste Code List	**May store these wastes**	**May store these wastes**	**May treat these wastes**	**May dispose these wastes**
P033	P033	P033	P033	P033
P034	P034	P034	P034	P034
P036	P036	P036	P036	P036
P037	P037	P037	P037	P037
P038	P038	P038	P038	P038
P039	P039	P039	P039	P039
P040	P040	P040	P040	P040
P041	P041	P041	P041	P041
P042	P042	P042	P042	P042
P043	P043	P043	P043	P043
P044	P044	P044	P044	P044
P045	P045	P045	P045	P045
P046	P046	P046	P046	P046
P047	P047	P047	P047	P047
P048	P048	P048	P048	P048
P049	P049	P049	P049	P049
P050	P050	P050	P050	P050
P051	P051	P051	P051	P051
P054	P054	P054	P054	P054
P056	P056	P056	P056	P056

	Module III (Containers)	Module IV (Tanks)	Module IV (Tanks)	Module VI (Landfills)
EPA Waste Code List	**May store these wastes**	**May store these wastes**	**May treat these wastes**	**May dispose these wastes**
P057	P057	P057	P057	P057
P058	P058	P058	P058	P058
P059	P059	P059	P059	P059
P060	P060	P060	P060	P060
P062	P062	P062	P062	P062
P063	P063	P063	P063	P063
P064	P064	P064	P064	P064
P065	P065	P065	P065	P065
P066	P066	P066	P066	P066
P067	P067	P067	P067	P067
P068	P068	P068	P068	P068
P069	P069	P069	P069	P069
P070	P070	P070	P070	P070
P071	P071	P071	P071	P071
P072	P072	P072	P072	P072
P073	P073	P073	P073	P073
P074	P074	P074	P074	P074
P075	P075	P075	P075	P075
P076	P076	P076	P076	P076
P077	P077	P077	P077	P077

	Module III (Containers)	Module IV (Tanks)	Module IV (Tanks)	Module VI (Landfills)
EPA Waste Code List	**May store these wastes**	**May store these wastes**	**May treat these wastes**	**May dispose these wastes**
P078	P078	P078	P078	P078
P081	P081	P081	P081	P081
P082	P082	P082	P082	P082
P084	P084	P084	P084	P084
P085	P085	P085	P085	P085
P087	P087	P087	P087	P087
P088	P088	P088	P088	P088
P089	P089	P089	P089	P089
P092	P092	P092	P092	P092
P093	P093	P093	P093	P093
P094	P094	P094	P094	P094
P095	P095	P095	P095	P095
P096	P096	P096	P096	P096
P097	P097	P097	P097	P097
P098	P098	P098	P098	P098
P099	P099	P099	P099	P099
P101	P101	P101	P101	P101
P102	P102	P102	P102	P102
P103	P103	P103	P103	P103
P104	P104	P104	P104	P104

	Module III (Containers)	Module IV (Tanks)	Module IV (Tanks)	Module VI (Landfills)
EPA Waste Code List	**May store these wastes**	**May store these wastes**	**May treat these wastes**	**May dispose these wastes**
P105	P105	P105	P105	P105
P106	P106	P106	P106	P106
P108	P108	P108	P108	P108
P109	P109	P109	P109	P109
P110	P110	P110	P110	P110
P111	P111	P111	P111	P111
P112	P112	P112	P112	P112
P113	P113	P113	P113	P113
P114	P114	P114	P114	P114
P115	P115	P115	P115	P115
P116	P116	P116	P116	P116
P118	P118	P118	P118	P118
P119	P119	P119	P119	P119
P120	P120	P120	P120	P120
P121	P121	P121	P121	P121
P122	P122	P122	P122	P122
P123	P123	P123	P123	P123
P127	P127	P127	P127	P127
P128	P128	P128	P128	P128
P185	P185	P185	P185	P185

	Module III (Containers)	Module IV (Tanks)	Module IV (Tanks)	Module VI (Landfills)
EPA Waste Code List	**May store these wastes**	**May store these wastes**	**May treat these wastes**	**May dispose these wastes**
P188	P188	P188	P188	P188
P189	P189	P189	P189	P189
P190	P190	P190	P190	P190
P191	P191	P191	P191	P191
P192	P192	P192	P192	P192
P194	P194	P194	P194	P194
P196	P196	P196	P196	P196
P197	P197	P197	P197	P197
P198	P198	P198	P198	P198
P199	P199	P199	P199	P199
P201	P201	P201	P201	P201
P202	P202	P202	P202	P202
P203	P203	P203	P203	P203
P204	P204	P204	P204	P204
P205	P205	P205	P205	P205
	P999 w/F999	P999 w/F999	P999 w/F999	P999 w/F999
PCBs	PCBs	PCBs[1]	PCBs[1]	PCBs[1]
U001	U001	U001	U001	U001
U002	U002	U002	U002	U002
U003	U003	U003	U003	U003

	Module III (Containers)	Module IV (Tanks)	Module IV (Tanks)	Module VI (Landfills)
EPA Waste Code List	**May store these wastes**	**May store these wastes**	**May treat these wastes**	**May dispose these wastes**
U004	U004	U004	U004	U004
U005	U005	U005	U005	U005
U006	U006	U006	U006	U006
U007	U007	U007	U007	U007
U008	U008	U008	U008	U008
U009	U009	U009	U009	U009
U010	U010	U010	U010	U010
U011	U011	U011	U011	U011
U012	U012	U012	U012	U012
U014	U014	U014	U014	U014
U015	U015	U015	U015	U015
U016	U016	U016	U016	U016
U017	U017	U017	U017	U017
U018	U018	U018	U018	U018
U019	U019	U019	U019	U019
U020	U020	U020	U020	U020
U021	U021	U021	U021	U021
U022	U022	U022	U022	U022
U023	U023	U023	U023	U023
U024	U024	U024	U024	U024

	Module III (Containers)	Module IV (Tanks)	Module IV (Tanks)	Module VI (Landfills)
EPA Waste Code List	**May store these wastes**	**May store these wastes**	**May treat these wastes**	**May dispose these wastes**
U025	U025	U025	U025	U025
U026	U026	U026	U026	U026
U027	U027	U027	U027	U027
U028	U028	U028	U028	U028
U029	U029	U029	U029	U029
U030	U030	U030	U030	U030
U031	U031	U031	U031	U031
U032	U032	U032	U032	U032
U033	U033	U033	U033	U033
U034	U034	U034	U034	U034
U035	U035	U035	U035	U035
U036	U036	U036	U036	U036
U037	U037	U037	U037	U037
U038	U038	U038	U038	U038
U039	U039	U039	U039	U039
U041	U041	U041	U041	U041
U042	U042	U042	U042	U042
U043	U043	U043	U043	U043
U044	U044	U044	U044	U044
U045	U045	U045	U045	U045

	Module III (Containers)	Module IV (Tanks)	Module IV (Tanks)	Module VI (Landfills)
EPA Waste Code List	**May store these wastes**	**May store these wastes**	**May treat these wastes**	**May dispose these wastes**
U046	U046	U046	U046	U046
U047	U047	U047	U047	U047
U048	U048	U048	U048	U048
U049	U049	U049	U049	U049
U050	U050	U050	U050	U050
U051	U051	U051	U051	U051
U052	U052	U052	U052	U052
U053	U053	U053	U053	U053
U055	U055	U055	U055	U055
U056	U056	U056	U056	U056
U057	U057	U057	U057	U057
U058	U058	U058	U058	U058
U059	U059	U059	U059	U059
U060	U060	U060	U060	U060
U061	U061	U061	U061	U061
U062	U062	U062	U062	U062
U063	U063	U063	U063	U063
U064	U064	U064	U064	U064
U066	U066	U066	U066	U066
U067	U067	U067	U067	U067

	Module III (Containers)	Module IV (Tanks)	Module IV (Tanks)	Module VI (Landfills)
EPA Waste Code List	**May store these wastes**	**May store these wastes**	**May treat these wastes**	**May dispose these wastes**
U068	U068	U068	U068	U068
U069	U069	U069	U069	U069
U070	U070	U070	U070	U070
U071	U071	U071	U071	U071
U072	U072	U072	U072	U072
U073	U073	U073	U073	U073
U074	U074	U074	U074	U074
U075	U075	U075	U075	U075
U076	U076	U076	U076	U076
U077	U077	U077	U077	U077
U078	U078	U078	U078	U078
U079	U079	U079	U079	U079
U080	U080	U080	U080	U080
U081	U081	U081	U081	U081
U082	U082	U082	U082	U082
U083	U083	U083	U083	U083
U084	U084	U084	U084	U084
U085	U085	U085	U085	U085
U086	U086	U086	U086	U086
U087	U087	U087	U087	U087

	Module III (Containers)	Module IV (Tanks)	Module IV (Tanks)	Module VI (Landfills)
EPA Waste Code List	**May store these wastes**	**May store these wastes**	**May treat these wastes**	**May dispose these wastes**
U088	U088	U088	U088	U088
U089	U089	U089	U089	U089
U090	U090	U090	U090	U090
U091	U091	U091	U091	U091
U092	U092	U092	U092	U092
U093	U093	U093	U093	U093
U094	U094	U094	U094	U094
U095	U095	U095	U095	U095
U096	U096	U096	U096	U096
U097	U097	U097	U097	U097
U098	U098	U098	U098	U098
U099	U099	U099	U099	U099
U101	U101	U101	U101	U101
U102	U102	U102	U102	U102
U103	U103	U103	U103	U103
U105	U105	U105	U105	U105
U106	U106	U106	U106	U106
U107	U107	U107	U107	U107
U108	U108	U108	U108	U108
U109	U109	U109	U109	U109

	Module III (Containers)	Module IV (Tanks)	Module IV (Tanks)	Module VI (Landfills)
EPA Waste Code List	**May store these wastes**	**May store these wastes**	**May treat these wastes**	**May dispose these wastes**
U110	U110	U110	U110	U110
U111	U111	U111	U111	U111
U112	U112	U112	U112	U112
U113	U113	U113	U113	U113
U114	U114	U114	U114	U114
U115	U115	U115	U115	U115
U116	U116	U116	U116	U116
U117	U117	U117	U117	U117
U118	U118	U118	U118	U118
U119	U119	U119	U119	U119
U120	U120	U120	U120	U120
U121	U121	U121	U121	U121
U122	U122	U122	U122	U122
U123	U123	U123	U123	U123
U124	U124	U124	U124	U124
U125	U125	U125	U125	U125
U126	U126	U126	U126	U126
U127	U127	U127	U127	U127
U128	U128	U128	U128	U128
U129	U129	U129	U129	U129

	Module III (Containers)	Module IV (Tanks)	Module IV (Tanks)	Module VI (Landfills)
EPA Waste Code List	**May store these wastes**	**May store these wastes**	**May treat these wastes**	**May dispose these wastes**
U130	U130	U130	U130	U130
U131	U131	U131	U131	U131
U132	U132	U132	U132	U132
U133	U133	U133	U133	U133
U134	U134	U134	U134	U134
U135	U135	U135	U135	U135
U136	U136	U136	U136	U136
U137	U137	U137	U137	U137
U138	U138	U138	U138	U138
U140	U140	U140	U140	U140
U141	U141	U141	U141	U141
U142	U142	U142	U142	U142
U143	U143	U143	U143	U143
U144	U144	U144	U144	U144
U145	U145	U145	U145	U145
U146	U146	U146	U146	U146
U147	U147	U147	U147	U147
U148	U148	U148	U148	U148
U149	U149	U149	U149	U149
U150	U150	U150	U150	U150

	Module III (Containers)	Module IV (Tanks)	Module IV (Tanks)	Module VI (Landfills)
EPA Waste Code List	**May store these wastes**	**May store these wastes**	**May treat these wastes**	**May dispose these wastes**
U151	U151	U151	U151	U151
U152	U152	U152	U152	U152
U153	U153	U153	U153	U153
U154	U154	U154	U154	U154
U155	U155	U155	U155	U155
U156	U156	U156	U156	U156
U157	U157	U157	U157	U157
U158	U158	U158	U158	U158
U159	U159	U159	U159	U159
U160	U160	U160	U160	U160
U161	U161	U161	U161	U161
U162	U162	U162	U162	U162
U163	U163	U163	U163	U163
U164	U164	U164	U164	U164
U165	U165	U165	U165	U165
U166	U166	U166	U166	U166
U167	U167	U167	U167	U167
U168	U168	U168	U168	U168
U169	U169	U169	U169	U169
U170	U170	U170	U170	U170

	Module III (Containers)	Module IV (Tanks)	Module IV (Tanks)	Module VI (Landfills)
EPA Waste Code List	**May store these wastes**	**May store these wastes**	**May treat these wastes**	**May dispose these wastes**
U171	U171	U171	U171	U171
U172	U172	U172	U172	U172
U173	U173	U173	U173	U173
U174	U174	U174	U174	U174
U176	U176	U176	U176	U176
U177	U177	U177	U177	U177
U178	U178	U178	U178	U178
U179	U179	U179	U179	U179
U180	U180	U180	U180	U180
U181	U181	U181	U181	U181
U182	U182	U182	U182	U182
U183	U183	U183	U183	U183
U184	U184	U184	U184	U184
U185	U185	U185	U185	U185
U186	U186	U186	U186	U186
U187	U187	U187	U187	U187
U188	U188	U188	U188	U188
U189	U189	U189	U189	U189
U190	U190	U190	U190	U190
U191	U191	U191	U191	U191

	Module III (Containers)	Module IV (Tanks)	Module IV (Tanks)	Module VI (Landfills)
EPA Waste Code List	**May store these wastes**	**May store these wastes**	**May treat these wastes**	**May dispose these wastes**
U192	U192	U192	U192	U192
U193	U193	U193	U193	U193
U194	U194	U194	U194	U194
U196	U196	U196	U196	U196
U197	U197	U197	U197	U197
U200	U200	U200	U200	U200
U201	U201	U201	U201	U201
U202	U202	U202	U202	U202
U203	U203	U203	U203	U203
U204	U204	U204	U204	U204
U205	U205	U205	U205	U205
U206	U206	U206	U206	U206
U207	U207	U207	U207	U207
U208	U208	U208	U208	U208
U209	U209	U209	U209	U209
U210	U210	U210	U210	U210
U211	U211	U211	U211	U211
U213	U213	U213	U213	U213
U214	U214	U214	U214	U214
U215	U215	U215	U215	U215

	Module III (Containers)	Module IV (Tanks)	Module IV (Tanks)	Module VI (Landfills)
EPA Waste Code List	**May store these wastes**	**May store these wastes**	**May treat these wastes**	**May dispose these wastes**
U216	U216	U216	U216	U216
U217	U217	U217	U217	U217
U218	U218	U218	U218	U218
U219	U219	U219	U219	U219
U220	U220	U220	U220	U220
U221	U221	U221	U221	U221
U222	U222	U222	U222	U222
U223	U223	U223	U223	U223
U225	U225	U225	U225	U225
U226	U226	U226	U226	U226
U227	U227	U227	U227	U227
U228	U228	U228	U228	U228
U234	U234	U234	U234	U234
U235	U235	U235	U235	U235
U236	U236	U236	U236	U236
U237	U237	U237	U237	U237
U238	U238	U238	U238	U238
U239	U239	U239	U239	U239
U240	U240	U240	U240	U240
U243	U243	U243	U243	U243

	Module III (Containers)	Module IV (Tanks)	Module IV (Tanks)	Module VI (Landfills)
EPA Waste Code List	**May store these wastes**	**May store these wastes**	**May treat these wastes**	**May dispose these wastes**
U244	U244	U244	U244	U244
U246	U246	U246	U246	U246
U247	U247	U247	U247	U247
U248	U248	U248	U248	U248
U249	U249	U249	U249	U249
U271	U271	U271	U271	U271
U278	U278	U278	U278	U278
U279	U279	U279	U279	U279
U280	U280	U280	U280	U280
U328	U328	U328	U328	U328
U353	U353	U353	U353	U353
U359	U359	U359	U359	U359
U364	U364	U364	U364	U364
U367	U367	U367	U367	U367
U372	U372	U372	U372	U372
U373	U373	U373	U373	U373
U387	U387	U387	U387	U387
U389	U389	U389	U389	U389
U394	U394	U394	U394	U394
U395	U395	U395	U395	U395

	Module III (Containers)	Module IV (Tanks)	Module IV (Tanks)	Module VI (Landfills)
EPA Waste Code List	**May store these wastes**	**May store these wastes**	**May treat these wastes**	**May dispose these wastes**
U404	U404	U404	U404	U404
U408	U408	U408	U408	U408
U409	U409	U409	U409	U409
U410	U410	U410	U410	U410
U411	U411	U411	U411	U411

NOTES

1. "EPA LIST" (Column 1) are all EPA Waste Codes found in 40 C.F.R. § 261.
2. Must meet Condition II.D.7(Permitted and Prohibited Waste). Of this permit and other conditions of this RCRA-TSCA WAP for storage of waste and the waste must be compatible with storage vessel materials of construction.
3. Must meet LDR Standards (40 C.F.R. § 268) or Approved Variances.
4. The volatile organics in the waste must be < 500 ppm per subpart CC method or CHGM/Generator knowledge.
5. For the dioxin wastes marked with an asterisk, refer to the Supplemental Waste Management Plan, Attachment II-8, and Condition II.D.7 (Permitted and Prohibited Waste).

APPENDIX 3: HALOGENATED ORGANIC COMPOUNDS OF CONCERN

ANALYTE	CAS Number	Analysis Method
VOLATILE ORGANICS		
Bromodichloromethane	75-27-4	SW-846 8260B
Bromoform (Tribromomethane)	75-25-2	SW-846 8260B
Bromomethane	74-83-9	SW-846 8260B
Carbon tetrachloride	56-23-5	SW-846 8260B
Chlorobenzene	108-90-7	SW-846 8260B
2-Chloro-1,3-butadiene (Chloroprene)	126-99-8	SW-846 8260B
Chloroethane	75-00-3	SW-846 8260B
2-chloroethyl vinyl ether	110-75-3	SW-846 8260B
Chloroform	67-66-3	SW-846 8260B
Chloromethane	74-87-3	SW-846 8260B
3-Chloropropene (Allyl Chloride)	107-05-1	SW-846 8260B
Dibromochloromethane	124-48-1	SW-846 8260B
1,2-Dibromo-3-chloropropane	96-12-8	SW-846 8260B or 8270C
1,2-Dibromoethane	106-93-4	SW-846 8260B
Dibromomethane (methylene bromide)	74-95-3	SW-846 8260B
trans-1,4-Dichloro-2-butene	110-57-6	SW-846 8260B
Dichlorodifluoromethane	75-71-8	SW-846 8260B
1,1-Dichloroethane	75-34-3	SW-846 8260B
1,2-Dichloroethane	107-06-2	SW-846 8260B

ANALYTE	CAS Number	Analysis Method
trans-1,2-Dichloroethene	156-60-5	SW-846 8260B
1,1-Dichloroethene	75-35-4	SW-846 8260B
1,2-Dichloropropane	78-87-5	SW-846 8260B
cis-1,3-Dichloropropene	10061-01-5	SW-846 8260B
trans-1,3-Dichloropropene	10061-02-6	SW-846 8260B
Methyl iodide (Iodomethane)	74-88-4	SW-846 8260B
Methylene chloride (Dichloromethane)	75-09-2	SW-846 8260B
Pentachloroethane	76-01-7	SW-846 8260B or 8270C
1,1,1,2-Tetrachloroethane	630-20-6	SW-846 8260B
1,1,2,2-Tetrachloroethane	79-34-5	SW-846 8260B
Tetrachloroethene	127-18-4	SW-846 8260B
1,1,1-Trichloroethane	71-55-6	SW-846 8260B
1,1,2-Trichloroethane	79-00-5	SW-846 8260B
Trichloroethene	79-01-6	SW-846 8260B
Trichlorofluoromethane	75-69-4	SW-846 8260B
1,2,3-Trichloropropane	96-18-4	SW-846 8260B
Vinyl chloride	75-01-4	SW-846 8260B
SEMIVOLATILE COMPOUNDS (ACID/BASE/NEUTRAL EXTRACTABLES)		
bis(2-Chloroethoxy)methane	111-91-1	SW-846 8270C
bis(2-Chloroethyl) ether	111-44-4	SW-846 8270C
bis(2-Chloroisopropyl) ether (2,2'-oxybis(1-Chloropropane))	108-60-1	SW-846 8270C

ANALYTE	CAS Number	Analysis Method
p-Chloroaniline	106-47-8	SW-846 8270C
Chlorobenzilate	510-15-6	SW-846 8270C
4-Chloro-3-methylphenol (p-Chloro-m-cresol)	59-50-7	SW-846 8270C
2-Chloronaphthalene	91-58-7	SW-846 8270C
2-Chlorophenol	95-57-8	SW-846 8270C
3-Chloropropionitrile		
1,2-Dichlorobenzene (o-Dichlorobenzene)	95-50-1	SW-846 8270C
1,3-Dichlorobenzene (m-Dichlorobenzene)	541-73-1	SW-846 8270C
1,4-Dichlorobenzene (p-Dichlorobenzene)	106-46-7	SW-846 8270C
3,3'-Dichlorobenzidine	91-94-1	SW-846 8270C
2,4-Dichlorophenol	120-83-2	SW-846 8270C
2,6-Dichlorophenol	87-65-0	SW-846 8270C
Hexachlorobenzene	118-74-1	SW-846 8270C
Hexachlorobutadiene	87-68-3	SW-846 8270C
Hexachlorocyclopentadiene	77-47-4	SW-846 8270C
Hexachloroethane	67-72-1	SW-846 8270C
Hexachlorophene	70-30-4	SW-846 8270C
Hexachloropropene	1888-71-7	SW-846 8270C
4,4-Methylinebis(2-chloroaniline)		
Isodrin	465-73-6	SW-846 8270C
Pentachlorobenzene	608-93-5	SW-846 8270C
Pentachloronitrobenzene	82-68-8	SW-846 8270C

ANALYTE	CAS Number	Analysis Method
Pentachlorophenol	87-86-5	SW-846 8270C
Pronamide	23950-58-5	SW-846 8270C
1,2,4,5-Tetrachlorobenzene	95-94-3	SW-846 8270C
2,3,4,6-Tetrachlorophenol	58-90-2	SW-846 8270C
1,2,4-Trichlorobenzene	120-82-1	SW-846 8270C
2,4,5-Trichlorophenol	95-95-4	SW-846 8270C
2,4,6-Trichlorophenol	88-06-2	SW-846 8270C
Tris(2,3-dibromopropyl)phosphate		
ORGANOCHLORINE PESTICIDES & PCBs		
Aldrin	309-00-2	SW-846 8081A or 8270
Hexachlorocyclohexane alpha-BHC	319-84-6	SW-846 8081A or 8250
Hexachlorocyclohexane beta-BHC	319-85-7	SW-846 8081A or 8250
Hexachlorocyclohexane delta-BHC	319-86-8	SW-846 8081A or 8250
Hexachlorocyclohexane gamma-BHC (Lindane)	58-89-9	SW-846 8081A or 8250
Chlordane	57-74-9	SW-846 8081A or 8250
4,4'-DDD	72-54-8	SW-846 8081A or 8270
4,4'-DDE	72-55-9	SW-846 8081A or 8270
4,4'-DDT	50-29-3	SW-846 8081A or 8270
Dieldrin	60-57-1	SW-846 8081A or 8270
alpha-Endosulfan (Endosulfan I)	959-98-8	SW-846 8081A or 8270
beta-Endosulfan (Endosulfan II)	33213-65-9	SW-846 8081A
Endrin	72-20-8	SW-846 8081A or 8270

ANALYTE	CAS Number	Analysis Method
Endrin aldehyde	7421-93-4	SW-846 8081A or 8270
Heptachlor	76-44-8	SW-846 8081A or 8270
Heptachlor epoxide	1024-57-3	SW-846 8081A or 8270
Kepone	143-50-0	SW-846 8270C
Methoxychlor	72-43-5	SW-846 8081A or 8270
PCB-1016	12674-11-2	SW-846 8082
PCB-1221	11104-28-2	SW-846 8082
PCB-1232	11141-16-5	SW-846 8082
PCB-1242	53469-21-9	SW-846 8082
PCB-1248	12672-29-6	SW-846 8082
PCB-1254	11097-69-1	SW-846 8082
PCB-1260	11096-82-5	SW-846 8082
Toxaphene	8001-35-2	SW-846 8081A or 8250
Phenoxyacetic acid herbicides *		
2,4-Dichlorophenoxy acetic acid (2,4-D)	94-75-7	SW-846 8151A
2,4,5-T	93-76-5	SW-846 8151A
2,4,5-TP (Silvex)	93-72-1	SW-846 8151A

* When constituent specific analysis is conducted, these need only be quantified if the waste stream is non-incinerator residue and contains one or more of these compounds and/or carries a K042 or K043 waste code.