ATTACHMENT A-3

Waste Analysis Plan

FORM EQP 5111 ATTACHMENT A3
WASTE ANALYSIS PLAN (WAP)

This document is an attachment to the Michigan Department of Environmental Quality's *Instructions for Completing Form EQP 5111, Operating License Application Form for Hazardous Waste Treatment, Storage, and Disposal Facilities.* See Form EQP 5111 for details on how to use this attachment.

The administrative rules promulgated pursuant to Part 111, Hazardous Waste Management, of Michigan's Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (Act 451), being R 299.9504, R 299.9508, and R 299.9605, and Title 40 of the Code of Federal Regulations (CFR) §§270.14(b)(3) and 264.13(b) and (c), establish requirements for WAPs for hazardous waste management facilities. All references to 40 CFR citations specified herein are adopted by reference in R 299.11003.

This license application attachment addresses requirements for a WAP for the hazardous waste management units and the hazardous waste management facility for the *EQ Resource Recovery, Inc. (EQRR)* facility. All activities associated with the WAP will be conducted at the *EQRR or alternate EQ* facility.

This attachment is organized as follows:

A3.A COMMERCIAL FACILITY
- A3.A.1 Initial Waste Characterization Requirements for Generators
  - A3.A.1(a) Generator Waste Characterization Discrepancies
  - A3.A.1(b) Subsequent Waste Shipment Procedures
  - A3.A.1(c) Additional Waste Analysis Requirements
- Table A3.A.1 Waste Characterization Method
- A3.A.2 Waste Acceptance Procedures
  - A3.A.2(a) Review Paperwork
  - A3.A.2(b) Visual Inspection of Waste
  - A3.A.2(c) Waste Screening/Fingerprinting
- Table A3.A.2 Sample Collection Methods
- A3.A.3 Procedures to Ensure Compliance with Land Disposal Restrictions (LDR) Requirements
  - A3.A.3(a) Spent Solvent and Dioxin Wastes
  - A3.A.3(b) Listed Wastes
  - A3.A.3(c) Characteristic Wastes
  - A3.A.3(d) Radioactive Mixed Waste
  - A3.A.3(e) Leachates
  - A3.A.3(f) Laboratory Packs
  - A3.A.3(g) Contaminated Debris
  - A3.A.3(h) Waste Mixtures and Wastes with Overlapping Requirements
  - A3.A.3(i) Dilution and Aggregation of Wastes

A3.B CAPTIVE FACILITY

A3.C NOTIFICATION, CERTIFICATION, AND RECORD KEEPING REQUIREMENTS
- A3.C.1 Retention of Generator Notices and Certifications
- A3.C.2 Notification and Certification Requirements for Treatment Facilities
- A3.C.3 Waste Shipped to Subtitle C Facilities
- A3.C.4 Waste Shipped to Subtitle D Facilities
- A3.C.5 Recyclable Materials

A3.C.6 Record Keeping
A3.C.7 Required Notice
Attachment A3.A EQ Waste Characterization Report and Related Forms
Attachment A3.B EQRR Sampling and Analysis Procedure
Attachment A3.C EQ Quality Assurance Management Plan
Attachment A3.D Laboratory Personnel Qualifications

A3.A COMMERCIAL FACILITY

EQ Resource Recovery, Inc. (EQRR) is a commercial hazardous waste treatment and storage facility that receives wastes generated off site. *EQRR* has developed this WAP to ensure that its facility at *36345 Van Born Road, Romulus* will accept only wastes that it is authorized to accept. The hazardous wastes stored at *EQRR* will be properly characterized prior to waste acceptance. All generators will be required to provide a completed waste characterization report, including chemical analysis when appropriate. Waste screening will be conducted on each shipment of waste to ensure that the waste conforms to the waste profile for the generator and information on incoming manifests and to ensure that the waste is properly managed within the facility.

Analysis used in for the initial characterization/waste stream evaluation is conducted using test methods specified in "Test Methods for Evaluating Solid Waste", USEPA, SW-846, the most current edition or identified in Appendix A-3.B or non SW-846 methods.

EQRR also generates hazardous wastes from the general operation of its facility. These can include general laboratory wastes, generator sample wastes, and storage tank bottoms. Waste characterization of site generated waste will be completed in the same manner as received wastes.
Any analysis conducted for this waste characterization procedure is conducted using the appropriate methods as specified in Test Methods for Evaluating Solid Waste Physical/Chemical Methods, US EPA, SW-846, (Latest Edition). Except for flash point and pH waste streams generated by EQRR are typically analyzed at off-site laboratories.

All analysis performed pursuant to this application will be consistent with the QA/QC Plan included in Attachment A3.B. All samples for the purpose of waste characterization will be collected, transported, stored, and disposed by trained and qualified individuals in accordance with the QA/QC Plan. Forms referenced or included in this attachment are representative of forms in use at the facility. The forms may change over time in accordance with regulatory changes, needs of the facility, company policies, or operational needs. Form revisions will be handled in accordance with the requirements of R299.9519.

In accordance with R 299.9609 and 40 CFR §264.73 and Part 264, Appendix I, *EQRR* will retain all records and results of waste determinations performed as specified in 40 CFR §§264.13, 264.17, 264.314, 264.1034, 24.1063, 264.1083, 268.4(a), and 268.7 in the facility operating record until closure of the facility.

A3.A.1 Initial Waste Characterization Requirements for Generators
[R 299.9605(1) and R 299.9504(1)(c) and 40 CFR §264.13(b)(5)]

EQRR will require the following waste profile information for initial waste shipments from all off-site generators prior to shipment.

See Attachment A3.A EQ Waste Characterization Report (WCR)

In addition to the waste profile information submitted by the generator, *EQRR* may:

☒ Request submittal of a representative waste sample

☐ Conduct an audit of the generator facility

☐ Review industry literature to identify typical waste streams

☒ Other: Request analytical data, Material Safety Data Sheets, specification sheets, or other forms of information that provide relevant detail specific to the waste material.

All waste streams are evaluated in accordance with the Resource Conservation and Recovery Act (RCRA) and Michigan Hazardous Waste Management Administrative Rules promulgated pursuant to Part 111 of the Natural Resources and Environmental Protection Act (Act 451), including sampling and analysis as necessary, to determine acceptability for treatment and/or storage. The appropriate handling method is determined based on the waste characterization, chemical and physical characteristics and compatibility with the processes.

Initial Waste Characterization

The generator provides physical and chemical information of the waste stream using the EQ Waste Characterization Form. The information submitted includes a description of the generating process that is used to determine if the waste is a listed hazardous waste. If the waste is listed, it is evaluated as being from a non-specific source (F), a specific source (K), or discarded commercial product, off-specification species container residue or spill residue thereof (U, P). If the waste is not from a listed source it is evaluated for being a characteristic hazardous waste (D, S). The information provided by the generator is evaluated by EQRR and is relied upon as the basis for decision to accept the waste; all evaluations are conducted on a case-by-case, waste stream specific basis. Material Safety Data Sheet (MSDS) and generator knowledge will also be used for waste characterization purposes if analytical data is not available and the information provided representative of the waste. If the MSDS or other provided information identifies the product as exhibiting hazardous waste characteristics or that it is a listed waste, it will be managed as such.

The information submitted by the generator regarding a waste stream is used to determine the need, nature and extent of any additional analytical data prior to the acceptance of a new waste stream. The information is used as the basis for determining how to effectively and safely treat, reclaim, and/or store the waste stream. The information includes:

- Identification of the generator
- Shipping and packaging information
- Physical Characteristics
- Waste composition and description of the waste generating process

- Hazardous/Non-hazardous waste determination and TCLP concentrations
- TSCA and Additional CAA information
- Fuel blending data
- Constituent information (UHC, VOHAP, VOC, and TRI)
- Existing data as furnished by the generator including both laboratory analyses and relevant Material Safety Data Sheets
- Land Disposal Restriction Information

This information is provided on an EQ Waste Characterization Report (WCR) or equivalent form. Copies of the current form revision can be found in Appendix A3.A.

Land Disposal Restriction

Under 40 CFR 268, the generator of a hazardous waste must determine if the waste is subject to land disposal restrictions and if so the appropriate treatment standard/method. The applicable treatment standard/method must be determined at the point of initial generation prior to any treatment. The generator must use analysis of the waste or knowledge of the waste to make this determination.

For waste streams that are subject to the Part 268 land disposal prohibition, EQRR requires the generator to provide a one-time land disposal restriction notification and certification (as appropriate) using a properly completed EQ Land Disposal Restriction Form (in Appendix A-3.A).

Universal Wastes

Universal Waste may be received for transshipment to other TSDF facilities or recycling centers. EQRR will accept containerized universal waste and store them in the container management building. Universal wastes will be inspected and verified upon receipt and will be labeled and shipped as required by the universal waste regulations.

Abandoned Waste

Occasionally containers of unknown substances are abandoned by unknown individuals and found in unsecured locations. These are known as GERA (Government Emergency Response Agency) sites. Contractors without permitted storage are hired by federal, state or local enforcement agencies to remove the containers from where they were abandoned and arrange for proper disposal. These abandoned containers may be brought into EQRR for storage purposes only, prior to completion of the waste characterization. A bulk load of Abandoned Waste will be placed into a loading/unloading containment structure while the power unit remains attached and the driver remains with the unit until characterization, approval, and acceptance can be completed. Abandoned Waste received in containers will be placed into the container management building on portable containment systems at a location along the west wall established for isolation of potentially incompatible wastes until characterization, approval, and acceptance can be completed. The area will be taped off to designate the unknown status of the waste.

Prior to receiving an abandoned waste a fingerprint analysis will be completed on a representative sample of each waste type as identified from the field screening. The fingerprint analysis will include flash point, pH, cyanide, sulfide, and oxidizing potential. Materials that are reactive will not be accepted.

Upon receipt, a full waste characterization analysis will be completed using a representative sample of each waste type as identified during the field screening process. The analytical

testing will be done in accordance with the current SW-846 requirements. EQRR will complete the waste characterization, approval creation, and acceptance process before the waste is placed into general container storage, a storage tank for treatment, or trans-shipped to an alternate disposal facility.

Only a photocopy of the manifest may be distributed to the generator and the transporter before EQRR receives the complete analytical testing results and determines the final designated facility for the waste. After the additional analytical results are received, EQRR will complete the waste approval process within one working day. If the waste is determined not to be acceptable at EQRR then the process to obtain an
Approval at another facility will be initiated. Once the waste is either received at EQRR or shipped to another facility, then the original manifest is corrected and distributed following the regular procedures.

Test Methods

Analysis used in for the initial characterization/waste stream evaluation is conducted using test methods specified in "Test Methods for Evaluating Solid Waste", USEPA, SW-846, the most current edition or identified in Appendix A-3.B or non SW-846 methods.

Pre-qualification Analysis

During the waste stream evaluation process EQRR personnel may decide, at their discretion, to conduct confirmatory analysis on a representative sample of the waste to either confirm information provided or to determine treatability. When analysis is conducted, methods listed in Table A3.A.1 and/or Table A3.A.2 will be used.

Selection of Handling Method

Based on the information provided by the generator and obtained through any pre-qualification analysis conducted, the hazardous waste stream is categorized as to type and assessed as to suitability and compatibility with the available hazardous waste handling methods at EQRR. Handling methods include:

1) Fuel Blending:
   Rich - Waste is blended into a Hazardous Waste Fuel meeting the specifications of the intended fuel burner.
   Lean - Waste is consolidated and shipped off site for incineration.

2) Recovery:
   Thin-Film Evaporation - Waste with adequate recoverable solvent is processed through a Thin-Film Evaporator to produce a useable product. Depending on customer specifications, the recovered product may or may not be further processed using the Fractional Distillation Column.
   Fractional Distillation Column - Wastes processed through the thin film evaporator may, depending on customer specification, require further processing through the Fractional Distillation Column to meet specification. Wastes with high concentrations of recoverable solvents with low levels of contaminants may also be processed through the fractional distillation column to produce a useable product.

3) Storage only prior to:
   Trans-shipment - Containerized waste is received and placed into storage. When adequate volume is received and/or delivery to an alternative TSDF is arranged

then the waste is shipped off site in the same container as received. A new manifest and hazardous waste labels are created listing EQRR as the generator.

Consolidation - Containerized waste is received and is placed into storage. The containerized waste is consolidated with other compatible wastes to fill containers or into a larger container prior to off-site shipment to an alternative TSDF.

4) Pass Through:
Waste is received, fingerprinted but not placed into storage. Bulk waste is shipped to an alternative TSDF without being unloaded from the vehicle. Containerized waste is unloaded, sampled and placed back into the truck. These wastes are considered to be in storage and shall be included in any calculation of facility storage capacity.

The handling method is determined based on several factors including:

Physical and chemical characteristics
Waste Codes
Compatibility with the various processes
Recyclability and marketability of product
BTU

Generator Notification

After the Waste Stream Characterization Evaluation is completed, the generator is notified that the waste stream, based on the information and, when applicable the sample provided, may be shipped to the facility. All waste streams, upon pre-qualification are assigned a handling method and a unique waste stream number. A hard copy file with the generator supplied information and any pre-qualification analysis is maintained at the facility. These files are maintained until closure of the facility.

A3.A.1(a) Generator Waste Characterization Discrepancies

[R 299.9605(1) and R 299.9504(1)(c) and 40 CFR §§264.13(a)(3) and (4), 264.13(b)(c), and 264.72]

Discrepancies between a Waste Characterization Report any samples received or waste materials subsequently received may be resolved through contact with the waste generator. Resolution may involve the creation of a new Waste Characterization Report, additional analytical testing, or amendment of an existing characterization report. If the discrepancy cannot be resolved EQRR may choose not to approve the generated waste into its facility.

A3.A.1(b) Subsequent Waste Shipment Procedures

[R 299.9605(1) and R 299.9504(1)(c) and 40 CFR §§264.13(a)(3) and 264.13(b)(4)]

EQRR requires the generator to update its Waste Characterization Report or its supporting documentation if the generating process has been modified, the waste characteristics have otherwise changed, or if EQRR has reason to believe that the waste is not consistent with prior

receipts of that waste approval. This may be accomplished through the use of a Generator Waste Amendment Form (Attachment A3.A) or through submittal of a revised WCR.

For each active waste approval, all generators must provide annual certification that the waste generating process has not changed. This can be completed using an annual notification and certification form or the generator may provide an updated WCR annually. If the WCR is provided, EQRR must review the newly supplied data against the original approval data and update all relevant information.

All waste streams generated by EQRR will be evaluated on an annual basis. This may occur more frequently if EQRR's generating process has changed. Test parameters chosen for characterization of EQRR generated waste will be in accordance with the receiving facilities requirements.

A3.A.1(c) Additional Waste Analysis Requirements

[R 299.9605(1) and R 299.9504(1)(c) and 40 CFR §§264.13(b)(6) and 264.13(c(3)]

EQRR will review the waste profile information to ensure that the facility is authorized to receive the waste, and can manage the waste in compliance with the following:

☒ R 299.9605 and 40 CFR §264.17	General requirements for ignitable, reactive, or incompatible wastes [Attachment A6]
☒ R 299.9605 and 40 CFR §264.314	Special requirements for bulk and containerized liquid [Facility is not a landfill]
☒ R 299.9630 and 40 CFR §264.1034(d)	Test methods and procedures (Subpart AA) [Attachment A3, Section A3.A.2(c)]
☒ R 299.9631 and 40 CFR §264.1063(d)	Test methods and procedures (Subpart BB) [Attachment A3, Section A3.A.2(c)]
☒ 40 CFR §264.1083	Waste determination procedures (Subpart CC) [Attachment A3, Section A3.A.2(c)]
☒ R 299.9627 and 40 CFR §268.7	Waste analysis and record keeping LDR requirement [Attachment A3, Sections A3.A.3, A3.B.3 and A3.C]
☒ R 299.9228	Universal waste requirements [No analytical Requirements]

Table A3.A.1

Waste Characterization Methods

Parameter	Property	Test method
Ignitability	-Flashpoint, if liquid -Capable under STP of causing a fire through friction, absorption of moisture, or spontaneous chemical change that creates a hazard, if not a liquid -Ignitable compressed Gas -Oxidizer	Test Methods for Evaluation Solid Waste Physical/Chemical Methods,, US EPA SW-846, Method 1010 or 1020 49 CFR 173.115 49 CFR 173-Appendix F to Part 173 Guidelines for Classification and Packaging Group Assignment of Division 5.1 Materials
Corrosivity	-pH -Corrosion to metal	Test Methods for Evaluation Solid Waste Physical/Chemical Methods,, US EPA SW-846, Method 9040. Test Methods for Evaluation Solid Waste Physical/Chemical Methods,, US EPA SW-846, Method 1110
Reactivity	-Unstable -Violent reaction with water -Cyanide and/or Sulfide bearing when exposed to pH between 2 and 12.5 -Capable of detonation or explosive decomposition -DOT Forbidden, Class A or B Explosive	Test Methods for Evaluation Solid Waste Physical/Chemical Methods,, US EPA SW-846, Method found in 7.3.3.2 and 7.3.4.2
Toxicity	-Toxicity Characteristic -Land Disposal Restrictions	Test Methods for Evaluation Solid Waste Physical/Chemical Methods,, US EPA SW-846, Method 1311
PCB's	-Land Disposal Restrictions -Toxic Substance	Test Methods for Evaluation Solid Waste Physical/Chemical Methods,, US EPA SW-846, Method 8080, 8270, 8081, and/or 8250

Additional Characterization Methods

Parameter	Purpose	Test Method
Specific Gravity	Reporting purposes	See EQRR modified Karl Fischer method
Chlorine Content	Fuel Blending Criteria	Test Methods for Evaluation Solid Waste Physical/Chemical Methods,, US EPA SW-846, Methods 5050, 9252, or 9253
Water	Fuel Blending Criteria	EQRR Procedure (Karl Fischer)
Heat Content (BTU)	Fuel Blending Criteria	ASTM Method D-240
PH	Fuel Blending Criteria	Test Methods for Evaluation Solid Waste Physical/Chemical Methods,, US EPA SW-846, Method 9045 B or 9040 A
Compatibility with other wastes	Protection of human health, environment and equipment	EQRR Compatibility Screening
Reactivity with water	Protection of human health, environment and equipment	EQRR Water Reactivity Screening

Table A3.A.1 lists the waste analysis procedures, including screening parameters for each hazardous waste, the rationale for the selection of these parameters, test methods that will be used to test for these parameters, the appropriate reference, whether the waste is specified in R 299.9216, the frequency of waste screening, and the rationale for the frequency. The sampling methods that will be used to obtain a representative sample of the waste to be analyzed and the sampling equipment and rationale are summarized in Table A3.A.2. The results of the waste screening/fingerprint analysis will be compared to the waste profile information and analytical results provided by the generator during the initial waste characterization process. The outside container of inner laboratory pack containers will be 100 percent visually inspected. Containers of personal protective equipment (PPE) or debris will undergo visual inspection. All discrepancies will be resolved before processing the waste.

A3.A.2 Waste Acceptance Procedures

[R 299.9605(1) and R 299.9504(1)(c), and 40 CFR §§264.13(c), 264.72(a) and (b), and 264.73(b)]

Waste shipments arrive at the facility in the following containers:

☒ Drums ☒ Totes ☒ Tanker trucks

☒ Carboys ☐ Wrangler box ☒ Filter bags

☐ Roll-off boxes ☒ Vacuum trucks ☒ Other: *[Pails, 1-gallon containes, cylinders, IBC's, ISO-tainers*

Upon receipt of wastes from an off-site generator, *EQRR* will perform all of the following tasks:

- Review paperwork
- Visually inspect the waste
- Perform waste screening/fingerprint analysis of waste

These tasks are discussed below.

A3.A.2(a) Review Paperwork
[R 299.9605(1) and R 299.9504(1)(c), and 40 CFR §§264.13(c), 264.72(a) and (b), and 264.73(b)]

EQRR will review all paperwork, including manifests and LDR notifications, before any wastes are accepted by the facility. *EQRR* will review all paperwork for completeness. In addition, the manifest and LDR notification will be compared for consistency. The manifest will also be compared to the waste profile and analytical information provided by the generator and to the waste shipment to ensure the accuracy of information provided on shipment paperwork. The manifest will also be compared to the number of containers, the volume, and/or the weight of the waste in the shipment. All discrepancies will be resolved before processing the waste. The generator will be contacted to resolve any conflicts regarding the shipping documents.

3.A.2(b) Visual Inspection of Waste
[R 299.9605(1) and R 299.9504(1)(c) and 40 CFR §264.13(c)]

EQRR will visually inspect a minimum of one container and up to a maximum of *10* percent of the containers from each received approval. The contents of the containers will be visually inspected for the following:

☒ Color ☒ pH ☒ Physical State ☒ Consistency ☒ Other: *Odor*

Containers will be inspected for integrity and DOT or EPA marking/labeling.

Visual observations will be recorded and compared to the waste profile information. All discrepancies will be resolved through contact with the generator before processing the waste. In discrepancies cannot be resolved the waste will be rejected.

A3.A.2(c) Waste Screening/Fingerprinting
[R 299.9605(1) and R 299.9504(1)(c) and 40 CFR §§264.13(b)(14) and 264.13(c)(2)]

Sampling Procedures
Based on the intended handling method, a sample is collected of each hazardous waste stream. Based on the container type and physical state of the waste a variety of sample methods are used. The sampling procedures followed are those listed in 40 CFR 261 Appendix I for the different waste matrices and shipment sizes. The sampling method is selected using Table A-3.3.

1) Bulk Shipments
The sampling of bulk tank trucks and containers of liquid is conducted by using a Coliwasa sampler or equivalent method. The Coliwasa or equivalent sampler is

inserted into the container (tank truck, container, etc.) at a rate that permits the level inside and outside the sample to remain the same. When the sampler reaches the bottom of the container, the sampler is closed and the sample withdrawn. The Coliwasa is described in Test Methods for Evaluating Solid Waste Physical/Chemical Methods, US EPA, SW-846.

2) Containerized Wastes
A sample is collected from ten percent (10%) of the containers randomly chosen for each unique multi-container waste stream. The 10% samples collected from a unique waste stream are composited into a single container representing that shipment of the unique waste stream. This composite sample is evaluated by the lab and compared to the approval data for that unique waste stream.

When the waste to be sampled is too viscous to sample with a Coliwasa then a tool the equivalent of a thief is used. When the waste is the consistency of debris, then a representative selection of waste is hand selected.

Wastes Unsuitable for Sampling

Wastes that cannot be sampled will be compared visually at a 10% random selection rate to the waste stream approval information provided by the generator during the pre-qualification process to assure that the received waste matches the pre-qualification description.

The following is a list of examples of waste streams that are not conducive to sampling before acceptance:

- Articles, equipment, clothing (PPE)
- RCRA empty containers
- Friable Asbestos waste
- Filters and filter cartridges
- Contaminated debris and demolition waste
- Devices, or articles such as cathode ray tubes, transformers, lamps, batteries, etc.
- Discarded, off-specification, or outdated commercial chemical products if in the originally sealed and labeled container that are not to be processed at EQRR
- Waste streams as approved by MDEQ on a case-by-case basis.

These types of wastes may be received and accepted by EQRR but will not be processed, instead they will be shipped to an alternative TSDF in the same container as received.

Trans-shipment and Pass-Through Waste Streams

Trans-shipment waste streams will not be commingled with other wastes; however, they will be sampled using the sampling procedures specified above for bulk or containerized loads to verify that the waste being received is as represented on the WCR, shipping documentation, and DOT labels and markings.

Table A3.A.2
Sample Collection Methods

Type of Container	Number and Type of Samples Per Waste Stream	Methods for Waste Matrix*		
		Liquids	Slurries & Sludges	Solids
Tank Truck	1 Composite	Coliwasa or equivalent	Thief, Dipper, or equivalent sampling equipment	N/A
Vacuum Truck	1 Composite	Coliwasa or equivalent	Thief, Dipper, or equivalent sampling equipment	Thief, Dipper, or equivalent sampling equipment
Dump Box	1 Composite	Coliwasa or equivalent	Thief, Dipper, or equivalent sampling equipment	Thief, Dipper, or equivalent sampling equipment
Container	1 composite sample collected from 10% of the total number of containers of each waste steam	Coliwasa or equivalent	Thief, Dipper, or equivalent sampling equipment	Thief, Dipper, or equivalent sampling equipment

Sample Evaluation

When the sampling is complete, the sample is identified with the generator name, waste stream pre-qualification number, date, and manifest number and is delivered to the EQRR laboratory for analysis.

1) Compatibility-Tank Storage/Treatment
   Each waste stream that is intended to be processed or placed into tank storage for **Fuel Blending** will have its compatibility evaluated against other wastes in storage and the process following the procedures specified in Attachment A3.B to this section.

   Each waste stream that is intended to be processed, or placed into tank storage for **Solvent Reclaim** will have its compatibility evaluated against other waste in storage and the process following the procedures specified in Attachment A3.B of this section with the exception that the Polymerization Potential will not be evaluated and recorded.

2) Compatibility-Container Storage
   To determine compatibility of containerized waste being put in storage evaluation will be based on the USDOT Segregation and Separation requirements.

3) Corrosivity Screening
When specified the corrosivity of each waste steam will be evaluated using the methodology specified in Attachment A3.B of this section. Corrosivity is not the basis for rejection but rather a concern for human health and safety and protection of equipment.

4) Heat Content (BTU's)
When specified the BTU of the waste stream is evaluated.

5) Polychlorinated Biphenyls Screening (PCB's)
Fuel blending and reclamation waste streams that are sampled are screened for PCB's. The screening method followed is in Attachment A3.B of this section.

REJECTED LOAD PROCEDURES

EQRR may reject, fully or partially, waste loads received at its facility if the waste is found to be incompatible or does not match the waste characterization information supplied by the generator during the pre-qualification process. Rejected load procedures are established by EPA at 40 CFR Part 264.72.

Prior to the rejection of a waste load EQRR must contact the generator regarding where to send the rejected material and must ship the load within 60 days of receipt. The following procedure assumes that EQRR will generate a new manifest for the transportation of the rejected material.

ACCEPTANCE EVALUATION BY HANDLING METHOD

	Fuel Blending	Reclamation	Trans-shipment or Pass Through
Documentation Review	X	X	X
Container Inspection	X	X	X
Visual Inspection	X	X	X
Compatibility-Storage	X	X	X
Corrosivity Screening	X	X	X[1]
BTU	X		
% Water	X	X	X
Chloride	X		X
Specific gravity	X		X
Tank Compatibilty	X	X[3]	
PCB	X	X[2]	

[1] This evaluation will be conducted only if waste is to be placed into tank storage.
[2] PCB analysis is not performed on streams subject to tolling (returning reclaimed product to the generator that provided the waste)
[3] Tank Compatibility for Reclamation does not include Polymerization Potential.

Hazardous Waste Fuel Specifications

The end user of the hazardous waste fuel has specifications that the fuel must meet to be acceptable. EQRR conducts analysis of hazardous waste fuel to confirm that the blended fuel meets the specifications of the end user. The methods used to evaluate the hazardous waste fuel are duplicated from the end users, to insure that the hazardous waste fuel meets the end users specifications. These methods may include but are not limited to those listed in the following table.

Hazardous Waste Fuel Specification Methods

Parameter	Method	Range
Heat Content (BTU)	ASTM D240	0-25,000 BTU
Percent Water	EQRR modified Karl Fischer method	0-100%
Chloride	Test Methods for Evaluation Solid Waste Physical/Chemical Methods, US EPA SW-846, Method 9252, 9253	0-100%
pH	Test Methods for Evaluation Solid Waste Physical/Chemical Methods, US EPA SW-846, Method 9045	0-14
Specific Gravity	Performed as component of EQRR modified Karl Fischer method	4.91-13.54
PCB-screening	EQRR PCB Screening Procedure	Positive or Negative

Each thermal destruction facility (Fuel user or Incinerator) has its own specifications for acceptable waste. Wastes are blended to meet the intended facility's requirements with permit and economic considerations.

A3.A.3 Procedures to Ensure Compliance with Land Disposal Restrictions (LDR) Requirements [R 299.9627 and 40 CFR, Part 268]

All shipments of wastes subject to LDR received at the facility will be accompanied by appropriate generator notification and LDR notification in accordance with R 299.9627 and 40 CFR §268.7. The LDR notification accompanying generator wastes will be reviewed, and any discrepancies in the LDR notification and the associated manifest, analytical records, or Waste Profile Form will require shipment rejection unless additional, satisfactory, clarifying information is provided by the generator. All information obtained to document LDR compliance will be maintained in the facility operating record until closure of the facility.

If the facility receives a shipment of waste without LDR notification, or a notification with incorrect or incomplete information, the generator will be contacted to resolve discrepancies. Once a correct LDR has been received the approved waste will be accepted.

In accordance with the LDR regulations, all wastes shipped off site will be analyzed, or generator knowledge will be used when appropriate, to determine whether the waste meets the applicable LDR treatment standards specified in R 299.9627 and 40 CFR §§268.41-43. All analytical results will be maintained in the facility operating record until closure of the facility. Wastes that are determined through analysis to meet treatment standards as specified in R 299.9627 and 40 CFR §268.41-43 can be disposed of in a hazardous waste management landfill.

EQRR will supply LDR notifications and certification, including appropriate analytical records to support the certification, to the receiving facility with the first shipment of each waste. The notifications and certifications will contain the information required under R 299.9627 and 40 CFR §268.7. Any additional data obtained from the generators (e.g., Waste Profile Forms, original LDR notifications, analysis provided by generators) will be provided to the licensed TSDF where the waste will be sent.

A3.A.3(a) Spent Solvent and Dioxin Wastes
[R 299.9627 and 40 CFR §§264.13(a)(1), 268.7, 268.30, 268.31, 268.40, 268.41, 268.42, and 268.43]

Spent solvent wastes (F001-F005) are accepted at the facility. Generator process knowledge is typically used to determine the presence of spent solvent wastes (F001-F005). Generator process knowledge will be documented on the waste material profile report and LDR notification. The LDR notification will provide additional information regarding the appropriate treatment standards for the waste and whether it has already been treated to the appropriate standards.

A3.A.3(b) Listed Wastes
[R 299.9627, R 299.9213, and R 299.9214 and 40 CFR §§264.13(a)(1), 268.7, 268.33, 268.34, 268.35, 268.36, 268.39, 268.40, 268.41, 268.42, and 268.43]

Generator process knowledge is typically used to determine whether listed waste meets the applicable treatment standards or to demonstrate that the waste has been treated by the appropriate specified treatment technology. In accordance with R 299.9627 and 40 CFR §268.41, where treatment standards are based on concentrations in the waste extract, the facility will use toxicity characteristic leaching procedures (TCLP) to determine if wastes meet treatment standards. *Generator process knowledge* will be documented on the waste material profile report and LDR notification.

A3.A.3(c) Characteristic Wastes
[R 299.9627, R 299.9208, and R 299.9212 and 40 CFR §§261.3(d)(1), 264.13(a)(1), 268.7, 268.9, 268.37, 268.40, 268.41, 268.42, 268.43 and Part 268, Appendix I and Appendix IX]

Generator process knowledge is typically used to determine whether characteristic waste meets the applicable treatment standards or to demonstrate that the waste has been treated by the appropriate specified treatment technology. In accordance with R 299.9627 and 40 CFR §268.41, where treatment standards are based on concentrations in the waste extract, generators shipping waste to the facility will determine if their wastes meet treatment standards.

Typically, generator process knowledge is used to identify the underlying hazardous constituents that are expected to be present in the waste. Generator process knowledge shall be documented on the WCR and LDR notification for that approval.

A3.A.3(d) Radioactive Mixed Waste
[R 299.9627 and 40 CFR §§268.7, 268.35(c), 268.35(d), 268.36, and 268.42(d)]

☒ The facility does not accept radioactive mixed waste.

OR

☐ Generator process knowledge will be used to determine whether a radioactive mixed waste meets the applicable treatment standard.

A3.A.3(e) Leachates
[R 299.9627 and 40 CFR §260.10 and 40 CFR §§268.35(a) and 268.40]

☐ The facility does not accept single-source or multi-source F039 leachates.

OR

☐ Single-source leachate will not be combined to produce multi-source leachates.

EQRR will conduct an initial analysis of all regulated constituents in F039 leachates and, based on the results of the analysis, develop a reduced list of constituents to be monitored on a regular basis.

A3.A.3(f) Laboratory Packs
[R 299.9627 and 40 CFR §§268.7and 268.42(c) and Part 268, Appendix IV and Appendix V]

☐ The facility does not accept laboratory packs.

OR

☒ The laboratory packs accepted at the facility are not land disposed.

If a laboratory pack hazardous waste is combined with nonlaboratory pack hazardous waste prior to or during treatment, the entire mixture will be treated to meet the most stringent treatment standards for each waste constituent before being land disposed.

A3.A.3(g) Contaminated Debris
[R 299.9627 and 40 CFR §§268.2(g), 268.7, 268.9, 268.36, 268.45, and 270.13(n)]

☐ The hazardous debris categories and the contaminant categories associated with the types of hazardous debris accepted at the facility are presented in Table A3.A.3.

Hazardous debris accepted at the facility that exhibits the characteristics of ignitability, corrosivity, or reactivity will be treated using one of the extraction, destruction, or immobilization technologies identified in Table 1 of 40 CFR §268.45.

OR

☒ Contaminated debris is not accepted at the facility.

A3.A.3(h) Waste Mixtures and Wastes with Overlapping Requirements

[R 299.9627 and 40 CFR §§264.13(a), 268.7, 268.41(b), 268.43(b), and 268.45(a)]

Generator process information and analytical data will be used to demonstrate that those waste mixtures and wastes with multiple codes are properly characterized. Each waste that has more than one characteristic will be identified with a number for each characteristic. Waste identified as meeting a listing and exhibiting a characteristic will be primarily identified with the listed waste code for the purpose of manifesting, etc.

A3.A.3(i) Dilution and Aggregation of Wastes

[R 299.9627 and 40 CFR §268.3]

Listed wastes, if destined for land disposal, may not be diluted from the point of generation to the point of land disposal. Characteristic wastes may only be diluted if, (1) the waste is managed in a Clean Water Act (CWA)/CWA-equivalent surface unit or a Class I Safe Drinking Water Act injection well, (2) the waste has a concentration-based treatment standard or is treated using the DEACT technology-based treatment standard, and (3) the waste is not a D003 reactive waste.

The facility may not dilute or partially treat a listed waste to change its treatability category (i.e., from nonwastewater to wastewater), in order to comply with different treatment standards. If the wastes are all legitimately amenable to the same type of treatment to be performed, the facility may aggregate wastes for treatment.

A3.B CAPTIVE FACILITY

The EQRR facility is not considered a Captive Facility

A3.C NOTIFICATION, CERTIFICATION, AND RECORDKEEPING REQUIREMENTS

[R 299.9627 and R 299.9609 and 40 CFR §§264.73, 268.7, and 268.9(d)]

EQRR will perform the following procedures for preparing and/or maintaining applicable notifications and certifications to comply with LDRs:

A3.C.1 Retention of Generator Notices and Certifications
[R 299.9627 and 40 CFR §268.7(a)(7)]

EQRR will retain a copy of all notices, certifications, demonstrations, data, and other documentation associated with compliance to LDRs.

The following notices and certifications submitted by the initial generator of the waste will be reviewed and maintained:

- Notices of restricted wastes not meeting treatment standards or exceeding levels specified in RCRA §3004(d), including the information listed in R 299.9627 and 40 CFR §268.7(a)(1).
- Notices of restricted wastes meeting applicable treatment standards and prohibition levels, including the information in R 299.9627 and 40 CFR §268.7(a)(2).

A3.C.2 Notification and Certification Requirements for Treatment Facilities
[R 299.9627 and 40 CFR §268.7(b)]

The treatment facility will submit a notice and certification to the land disposal facility with each shipment of restricted waste or treatment residue of a restricted waste. The notice will include the information specified in R 299.9627 and 40 CFR §§268.7(b)(4) and 268.7(b)(5).

If the waste or treatment residue will be further managed at a different treatment or storage facility, the facility will comply with the notice and certification requirements applicable to generators as specified in R 299.9627 and 40 CFR §268.7(b)(6).

A3.C.3 Waste Shipped to Subtitle C Facilities
[R 299.9627 and 40 CFR §§268.7(a) and 268.7(b)(6)]

☐ The facility does not ship waste to Subtitle C facilities.

OR

☒ For restricted waste or waste treatment residues that will be further managed at a Subtitle C (hazardous waste management) facility, the facility will submit notifications and certifications in compliance with the notice and certification requirements applicable to generators under R 299.9627 and 40 CFR §268.7(a) and (b)(6).

A3.C.4 Waste Shipped to Subtitle D Facilities
[R 299.9627 and 40 CFR §§268.7(d) and 268.9(d)]

☐ The facility does not ship waste to Subtitle D facilities.

OR

☒ If the facility ships hazardous debris or characteristic waste to a Subtitle D facility, the facility will submit a one-time notification and certification for characteristic wastes, or listed wastes that are listed only because they exhibit a characteristic, that have been treated to remove the hazardous characteristic and are no longer considered hazardous. The facility will place a certification and all treatment records in the facility's file and send a notification and certification to the Director, or delegated representative,

describing the wastes and applicable treatment standards and identifying the Subtitle D (solid waste management) disposal facility receiving the waste. On an annual basis, the notification and certification will be updated and refiled if the process or operation generating the waste changes and/or if the Subtitle D facility receiving the waste changes.

A3.C.5 Recyclable Materials
[R 299.9627 and 40 CFR §268.7(b)(7)]

☒ The facility does **not accept** recyclable materials used in a manner constituting disposal.

OR

☐ For wastes that are recyclable materials used in a manner constituting disposal, in accordance with R 299.9206 and 40 CFR §266.20(b), the facility will submit a notice and certification to the Director, or delegated representative, with each shipment of waste describing the waste and applicable treatment standards and identifying the facility receiving the waste.

A3.C.6 Record Keeping
[R 299.9608(4), R 299.9609, R 299.9610(3), and R 299.9627 and
40 CFR §§264.72, 264.73, 268.7(a)(5), 268.7(a)(6), 268(a)(7), and 268.7(d)]

EQRR maintains a facility operating log in accordance with R 299.9609 and 40 CFR §264.73. The operating log consists of, at minimum, waste characterization reports, approval files, analytical results, fingerprint records, LDR's, and manifests.

Copies of all necessary notifications and certifications, as well as relevant inspection forms and monitoring data, are also maintained on file at the facility. Files will be maintained for a minimum of three years (for inspection records, LDR notification, manifests), or until facility closure (for environmental monitoring).

If a significant manifest discrepancy is discovered (such as variation in one-piece count or misrepresentation of the type of waste or corrosive rather than flammable) that cannot be resolved with the generator or transporter within 15 days of receipt, facility personnel will submit to the Director and Regional Administrator a letter describing the discrepancy and all attempts to reconcile the discrepancy. The letter will include a copy of the discrepant manifest or shipping document.

Recycling facilities*:* The facility will keep records of the name and location of each entity receiving a hazardous waste derived product.

A3.C.7 Required Notice
[R 299.9605(1) and 40 CFR §264.12(a) and (b))]

The facility will notify the Office Chief in writing at least four weeks before the date the facility expects to receive hazardous waste from a foreign source. Notice of subsequent shipments of the same waste from the same foreign source is not required. When receiving such hazardous waste, the facility will comply with applicable treaties or other agreements entered into between the country in which the foreign source is located and the United States.

When the facility is to receive hazardous waste from an off-site source, the facility will inform the generator in writing that the facility has the appropriate license for and will accept the waste the generator is shipping. The facility will keep a copy of this written notice in the operating record.

Attachment A3.A

EQ Waste Characterization Report and Related Forms

Profile Tracking # _____

WASTE CHARACTERIZATION REPORT

For assistance in completing this document or for additional information on EQ's service offerings, please visit our website at www.eqonline.com, or call 800-592-5489.

EQ – The Environmental Quality Company will choose the appropriate facility and method of waste management for your waste from the technologies offered at each EQ operation.

If you wish to direct this waste to a specific EQ facility(s) or treatment technology please indicate here:

Waste Common Name:

Section 1 – Generator & Customer Information

Generator EPA ID # _____

Generator _____

Facility Address _____

City _____ State ____ Zip _____

24-hour Emergency Response Number _____

_____

Mailing Address _____

City _____ State ____ Zip _____

Generator Contact _____

Title _____

Phone _____ Fax _____

E-mail _____

Internal Use Only: EQ Division _____

EQ Customer No._____

Invoicing Company _____

Address _____

City _____ State ____ Zip _____

Country _____

Invoicing Contact _____

Phone _____ Fax _____

Technical Contact _____

Phone _____ Fax _____

Cell Phone _____

E-mail _____

Section 2 – Shipping & Packaging Information

2.1) Shipping Volume & Frequency:

a) Volume of Waste to be Shipped: ❑_____Tons ❑_____Yard ❑_____Gallon ❑_____Pallet

❑_____Cubic Yard Box/Bag ❑_____DM55 ❑_____DM30 ❑_____DM15

❑_____DM10 ❑_____DM05 ❑ Tote, Size: _____ ❑ Other: _____

b) Frequency: ❑ One time ❑ Week ❑ Month ❑ Year ❑ Other: _____

2.2) DOT Information

a) Is this a U.S. Department of Transportation (USDOT) Hazardous Material? ❑ Yes ❑ No

b) If "Yes", indicate the proper shipping name per 49CFR 172.101 Hazardous Materials Table:

_____

_____

Section 3 – Special Properties

3.1) Color _____

3.2) Odor ❑ Ammonia ❑ Amines ❑ Mercaptans ❑ Sulfur ❑ Organic Acid

❑ Other: _____

3.3) Consistency at 70^0F: ❑ Solid ❑ Dust/Powder ❑ Debris ❑ Sludge ❑ Liquid ❑ Gas/Aerosol

© EQ-The Environmental Quality Company

3.4) What is the pH? ❑ ≤2 ❑ 2.1-4.9 ❑ 5 – 10 ❑ 10.1 – 12.4 ❑ ≥12.5 ❑ N/A

3.5) What is the flash point? ❑ <90^{0}F ❑ 90-139^{0}F ❑ 140-199^{0}F ❑ >200^{0}F ❑ N/A

3.6) Does this waste exhibit any of the following properties? **(check all that apply)**

❑ **None** ❑ Free Liquids ❑ Metal Fines ❑ Water Reactive ❑ Biohazard
❑ Shock Sensitive ❑ Oily Residue ❑ Dioxins ❑ Furans ❑ Aluminum
❑ Asbestos – non-friable ❑ Asbestos – friable ❑ Radioactive ❑ Air Reactive ❑ Isocyanates
❑ Biodegradable Sorbents ❑ Pyrophoric ❑ Reactive Sulfide ❑ Reactive Cyanide ❑ Explosives
❑ Temperature Controlled Organic Peroxide ❑ NORM / TENORM

Section 4 – Composition and Generating Process

4.1) Provide a physical and chemical composition of the waste (e.g. soil, water, PPE, debris, etc.). List the percent ranges of the material, either estimated or known.

_____ _____ to ____ % _____ _____ to ____ %
_____ _____ to ____ % _____ _____ to ____ %
_____ _____ to ____ % _____ _____ to ____ %

4.2) Provide a description of the generating process. *Remediation & IDW Sites: please provide a site history.*

_____
_____
_____

4.3) Are there any known previous handling or treatment issues involving this waste? ❑ Yes* ❑ No
*If yes, describe:_____

Section 5 – Hazardous Wastes

As determined by 40 CFR, Part 261 and State Rules: **Please list applicable waste code(s):**

5.1) Is this waste exempted from RCRA? ❑ Yes, please provide exemption: _____ ❑ No

5.2) Is this an EPA RCRA listed hazardous waste (F, K, P or U)? ❑ Yes: _____ ❑ No
a) For F006–F009, F012, does this come from a generator that conducts a cyanide plating process? ❑Yes ❑No

5.3) Is this an EPA RCRA characteristic hazardous waste (D001-D043)? ❑ Yes: _____ ❑ No
a) If this is a D001, is it: ❑ Flammable ❑ Oxidizer

5.4) Do any State Specific Hazardous Waste Codes apply? ❑ Yes: _____ ❑ No

If you answered 'no' to 5.2, 5.3 and 5.4, please proceed to Section 6.

5.5) EPA Source Code: _____ EPA Form Code: _____

5.6) Waste Code Determination Is Based On: ❑ Generator Knowledge ❑ Analysis ❑ MSDS
Analysis and/or MSDS may be required for review and approval for hazardous and non-hazardous waste streams.

5.7) Does this waste exceed Land Disposal Restriction levels? ❑ Yes ❑ No

a) Is this stream a wastewater (WW) or non-wastewater (NWW)? ❑ WW ❑ NWW
b) If this waste stream is greater than 50% soil, does it meet the alternative soil treatment standards of 40CFR 268.49? ❑ Yes ❑ No
c) Does this waste contain greater than 50% debris, by volume? ❑ Yes ❑ No
(Debris is greater than 2.5 inches in size.)
d) If the debris is larger than 3 ft x 3 ft x 3 ft, please provide the approximate dimensions and weight:

_____

5.8) If this is a characteristic hazardous waste, does it contain Underlying Hazardous Constituents? ❑ Yes* ❑ No

*If Yes, please list: _____
For a complete list of UHC constituents, please refer to 40 CFR 268.48

Section 6 – Non-Hazardous Wastes

Please list applicable waste code(s):

6.1) Do any State Specific Non-Hazardous Waste Codes apply? ❑ Yes ❑ No _____

6.2) Is this a Universal (UNIV) waste or a Recyclable Good (RG)? ❑ UNIV ❑ RG ❑ N/A

6.3) Is this waste used oil as defined by 40 CFR Part 279? ❑ Yes ❑ No

a) If yes, is the total halogen content of the used oil waste stream greater than 1,000 ppm? ❑ Yes ❑ No

b) If yes, what is the source of the halogen content?

- ❑ This is a metalworking oil/fluid containing chlorinated paraffins.
- ❑ This is used oil contaminated with chlorofluorocarbons from refrigeration units.
- ❑ This oil contains halogenated solvents. List specific solvents: _____
- ❑ Other, describe: _____

Section 7 – TSCA Information

7.1) What is the concentration of PCBs in the waste? ❑ None ❑ 0-49 ppm ❑ 50-499 ppm ❑ 500+ ppm

7.2) Does the waste contain PCB contamination from a source with a concentration ≥ 50 ppm? ❑ Yes ❑ No

If you answered "none" to 7.1 and "no" to 7.2, please proceed to Section 8.

7.3) Has this waste been processed into a non-liquid form? ❑ Yes* ❑ No

*If yes, what was the concentration of PCBs prior to processing? ❑ 0-499 ppm ❑ 500+ ppm

7.4) Is this non-liquid PCB waste in the form of soil, rags, debris, or other contaminated media? ❑ Yes ❑ No

7.5) Are you a PCB capacitor manufacturer or a PCB equipment manufacturer? ❑ Yes ❑ No

7.6) Has the PCB Article (e.g., transformer, hydraulic machine, PCB-contaminated electrical equipment) been drained/flushed of all PCBs and decontaminated in accordance with 40 CFR 761.60(b)? ❑ N/A ❑ Yes ❑ No

Section 8 – Clean Air Act Information

8.1) Is this waste subject to regulation under 40 CFR, Part 264, Subpart CC (VOC > 500 ppmw)? ❑ Yes ❑ No

8.2) Is this waste subject to regulation under 40 CFR, Part 63, Subpart DD (VOHAP > 500 ppmw)? ❑ Yes ❑ No

8.3) Is the site, or waste, subject to any other NESHAP/MACT standard(s)? ❑ Yes* ❑ No

*If Yes this document serves as notification that this waste contains chemicals _____ , _____

required to be managed in accordance with Part ❑ 61 ❑ 62 ❑ 63 Subpart _____ of NESHAP/MACT standards.

8.4) Does this waste stream contain Benzene? ❑ Yes ❑ No

If you answered "no" to 8.4, please proceed to Section 9.

8.5) Does the waste stream come from a facility subject to 40 CFR 61, Subpart FF (Benzene NESHAP)?

❑ Yes, please provide the SIC/NAICS code: _____ ❑ No

8.6) Does your facility manage the waste subject to Benzene NESHAP in a manner other than shipping off-site?

❑ Yes, please specify: _____ ❑ No

8.7) Is the generating source of this waste a facility with Total Annual Benzene (TAB) ≥10 Mg/year? ❑ Yes ❑ No

If you answered "no" to questions 8.5, 8.6 and 8.7, please proceed to Section 9.

8.8) Does the waste contain >10% water? ❑ Yes ❑ No

8.9) What is the TAB quantity for your facility? _____ Mg/Year

8.10) What is the total Benzene concentration in your waste? _____ Percent or _____ ppmw.

Supporting analysis must be attached. Do not use TCLP analytical results. Acceptable laboratory methods include 8020, 8240, 8260, 602 and 624.

Section 9 – Certification

I certify that all information (including attachments) is complete and factual and is an accurate representation of the known and suspected hazards, pertaining to the waste described herein. I authorize EQ's personnel to add supplemental information to the waste approval file, provided I am contacted and give verbal permission. I authorize EQ's personnel to obtain a sample from any waste shipment for purposes of verification and confirmation. I agree that, if EQ approves the waste described herein, all such wastes that are transported, delivered, or tendered to EQ by Generator or on Generator's behalf shall be subject to, and Generator shall be bound by, the attached Standard Terms and Conditions.

Generator Signature _____ Printed Name _____

Company _____ Title _____ Date _____

The generator's signature MUST appear on the EQ Waste Characterization Report. If the generator has authorized a third party to certify this document, a written notice must accompany this submittal.

STANDARD TERMS AND CONDITIONS

The Agreement between the Customer and EQ – The Environmental Quality Company and/or its member companies (hereinafter "EQ") related to or associated with Delivered Waste, as herein defined, shall be governed by the following Standard Terms and Conditions in addition to the terms and conditions contained in any Waste Characterization Report, Customer Approval Quote Confirmation, Generator Approval Notification, Notice of Waste Approval Expiration, and/or Credit Agreement associated with such Delivered Waste.

The Customer may use its standard forms (such as purchase orders, acknowledgments of orders, and invoices) to administer its dealings under this Agreement for convenience purposes, but all provisions thereof in conflict with these terms and conditions shall be deemed stricken.

Definitions

The following definitions shall apply for purposes of this Agreement:

"**Acceptable Waste"** shall mean any hazardous waste, as defined under applicable State or federal law, determined by EQ as acceptable for treatment and/or disposal in accordance with this Agreement.

"**Delivered Wastes"** shall mean all wastes (i) which are transported, delivered, or tendered to EQ by the Customer; (ii) which the Customer has arranged for the transport, delivery or tender to EQ; or (iii)) which are transported, delivered, or tendered to EQ under a Credit Agreement between the Customer and EQ.

"Non-Conforming Wastes" shall mean wastes that (a) are not in accordance in all material respects with the warranties, descriptions, specifications or limitations stated in the Waste Characterization Report and this Agreement; (b) have constituents or components of a type or concentration not specifically identified in the Waste Characterization Report (i) which increase the nature or extent of the hazard and risk undertaken by EQ in treating and/or disposing of the waste, or (ii) for whose treatment and/or disposal a Waste Management Facility is not designed or permitted, or (iii) which increase the cost of treatment and/or disposal of waste beyond that specified in EQ's price quote; or (c) are not properly packaged, labeled, described, or placarded, or otherwise not in compliance with United States Department of Transportation and United States Environmental Protection Agency regulations.

Control of Operations.

EQ shall have sole control over all aspects of the operation of any treatment and/or disposal facility of EQ receiving Delivered Wastes under this Agreement (hereinafter, "Waste Management Facility"), including, without limitation, maintaining EQ's desired volume of Acceptable Wastes being delivered to any Waste Management Facility by the Customer or any other person or entity.

Identification of Waste.

For each waste material to be transported, delivered, or tendered to EQ under this Agreement, the Customer shall provide, or cause to be provided, to EQ a representative sample of the waste material and a completed Waste Characterization Report containing a physical and chemical description or analysis of such waste material, which description shall conform with any and all guidelines for waste acceptance provided by EQ. On the basis of EQ's analysis of such representative sample of the waste material and such Waste Characterization Report, EQ will determine whether such wastes are Acceptable Wastes. EQ does not make any guarantee that it will handle any waste material or any particular quantity or type of waste material, and EQ reserves the right to the decline to transport, treat and/or dispose of waste material. The Customer shall promptly furnish to EQ any information regarding known, suspected or planned changes in the composition of the waste material. Further, the Customer shall promptly inform EQ of any change in the characteristic or condition of the waste material which becomes known to the Customer subsequent to the date of the Waste Characterization Report.

Non-Conforming Wastes.

In the event that EQ at any time discovers that any Delivered Waste is Non-Conforming Waste, EQ may reject or revoke its acceptance of the Non-Conforming Waste. The Customer shall have seven (7) days to direct an alternative lawful manner of disposition of the waste, unless it is necessary by reason of law or otherwise to move the Non-Conforming Waste prior to expiration of the seven (7) day period. If the Customer does not direct an alternative disposal, at its option, EQ may return any such Non-Conforming Wastes to the Customer, and the Customer shall pay or reimburse EQ for all costs and expenses incurred by EQ in connection with the receipt, handling, sampling, analyses, transportation and return to the Customer of such Non-Conforming Wastes. If it is impossible or impractical for EQ to return the Non-Conforming Waste to the Customer, the Customer shall reimburse EQ for all costs, of any type or nature whatsoever, incurred by EQ, solely because such Delivered Waste was Non-Conforming Waste (including, but not limited to, all costs associated with any remedial steps necessary, due to the nature of the Non-Conforming Waste, in connection with material with which the Non-Conforming Waste may have been commingled and all expenses and charges for analyzing, handling, locating, preparing for transporting, storing and disposing of any Non-Conforming Waste).

Customer Warranty - Acceptable Wastes.

All Delivered Wastes shall be Acceptable Wastes and shall conform in all material respects to the description and specifications contained in the Waste Characterization Report. The information set forth in the Waste Characterization Report or any manifest, placard or label associated with any Delivered Wastes, or otherwise represented by the Customer or the generator (if other than the Customer) to EQ, is and shall be true, accurate and complete as of the date of receipt of the involved waste by EQ.

Customer Warranty - Title to Wastes.

Either the Customer or the generator (if other than the Customer) shall hold clear title, free of any all liens, claims, encumbrances, and charges to Delivered Waste until such waste is accepted by EQ.

Customer Warranty - Compliance with Laws.

The Customer shall comply with all applicable federal, state and local environmental statutes, regulations, and other governmental requirements, as well as directives issued by EQ from time to time, governing the transportation, treatment and/or disposal of Acceptable Wastes, including, but not limited to, all packaging, manifesting, containerization, placarding and labeling requirements.

Customer Warranty - Updating Information.

If the Customer receives information that Delivered Waste or other hazardous waste described in the Waste Characterization Report, or some component of such waste, presents or may present a hazard or risk to persons, property or the environment which was not disclosed to EQ, or if the Customer or generator (if other than the Customer) has changed the process by which such waste results, the Customer shall promptly report such information to EQ in writing.

Customer Indemnity.

The Customer shall indemnify, defend and hold harmless EQ, and its affiliated or related companies, and all of their respective present or future officers, directors, shareholders, employees and agents from and against any and all losses, damages, liabilities, penalties, fines, forfeitures, demands, claims, causes of action, suits, costs and expenses (including, but not limited to, reasonable costs of defense, settlement, and reasonable attorneys' fees), which may be asserted against any or all of them by any person or any governmental agency, or which any or all of them may hereafter suffer, incur, be responsible for or pay out, as a result of or in connection with bodily injuries (including, but not limited to, death, sickness, disease and emotional or mental distress) to any person (including EQ's employees), damage (including, but not limited to, loss of use) to any property (public or private), or any requirements to conduct or incur expense for investigative, removal or remedial expenses in connection with contamination of or adverse effect on the environment, or any violation or alleged violation of any statues, ordinances, orders, rules or regulations of any governmental entity or agency, caused or arising out of (i) a breach of this Agreement by the Customer, (ii) the failure of any warranty of the Customer to be true, accurate and complete, or (iii) any willful or negligent act or omission of the Customer, or its employees or agents in connection with the performance of this Agreement.

Force Majeure

EQ shall not be liable for any failure to accept, receive, handle, treat, and/or dispose of Delivered Waste due to an act of God, fire, casualty, flood, war, strike, lockout, labor trouble, failure of public utilities, equipment failure, facility shutdown, injunction, accident, epidemic, riot, insurrection, destruction of operation or transportation facilities, the inability to procure materials, equipment, or sufficient personnel or energy in order to meet operational needs without the necessity of allocation, the failure or inability to obtain any governmental approvals or to meet Environmental Requirements (including, but not limited to voluntary or involuntary compliance with any act, exercise, assertion, or requirement of any governmental authority) which may temporarily or permanently prohibit operations of EQ, the Customer, or the Generator, or any other circumstances beyond the control of EQ which prevents or delays performance of any of its obligations under this Agreement.

Governing Laws

This Agreement shall in all respects be governed by and shall be construed in accordance with the laws of the State of Michigan applied to contracts executed and performed wholly within such state.

Bulk Disposal Charges

Quoted bulk disposal charges for solid materials will be billed by the cubic yard, if the waste density is less than 2,000lbs./cubic yard. If waste density is greater than 2,000 lbs./cubic yard, then bulk disposal charges will be billed by the ton, regardless of the approved container.

LAND DISPOSAL RESTRICTION & CERTIFICATION FORM

Generator Name: _____ **U.S. EPA ID No.:** _____

Uniform Manifest No.: _____ **LDR Page** _____ **of** _____

Manifest Page No. & Line Item	U.S. EPA Hazardous Waste Code (s)	NWW or WW	LDR Certification (One per Line)	Subcategory	Reference Number(s) of Hazardous Constituents contained in the waste. Complete for F001-F005, F039, D001-D043, Contaminated Soil (10x) and Debris.

I hereby certify that all information submitted on this and all associated documents, is complete and accurate to the best of my knowledge and information.

Generator Signature: _____ **Title:** _____

Printed Name: _____ **Date:** _____

LAND DISPOSAL RESTRICTION & CERTIFICATION FORM

Instructions

Please complete one line per waste stream:

Column 1: Enter the corresponding manifest page number and line item.

Column 2: Identify all U.S. EPA hazardous waste codes that apply to this waste shipment.

Column 3: Choose the appropriate treatability group: Non-Wastewater (NWW) or Wastewater (WW). Wastewaters contain less than 1% filterable solids and less than 1% Total Organic Carbon.

Column 4: Enter the letter of the appropriate paragraph from page 3 of this form. *(For generators of contaminated soil using the 10X rule, please select 'S' and circle the appropriate options. Please include the certification page with your shipment.)*

Column 5: Enter the appropriate Subcategory, if applicable. A reference list is available on page 4 of this document.

Column 6: For F001 – F005, F039, D001 – D043, Debris and Contaminated Soil (10X): please enter the Reference Number(s) for any constituents in your waste stream subject to treatment. The Reference Number(s) can be found in the attached Underlying Hazardous Constituent Table on pages 5-8.

LAND DISPOSAL RESTRICTION & CERTIFICATION FORM

LDR Certifications

S. **GENERATORS OF CONTAMINATED SOIL**
THIS CONTAMINATED SOIL *DOES / DOES NOT* (CIRCLE ONE) CONTAIN LISTED HAZARDOUS WASTE AND *DOES / DOES NOT* (CIRCLE ONE) EXHIBIT A CHARACTERISTIC OF HAZARDOUS WASTE AND *IS SUBJECT TO / COMPLIES WITH* (CIRCLE ONE) THE SOIL TREATMENT STANDARDS AS PROVIDED BY 268.49(c) OR THE UNIVERSAL TREATMENT STANDARDS.

A. THIS RESTRICTED WASTE REQUIRES TREATMENT TO THE APPLICABLE STANDARD. This waste must be treated to the applicable performance based treatment standard set forth in 40CFR Part 268 Subpart C and Subpart D, 268.40 or RCRA Section 3004(d) prior to land disposal.

B. THIS HAZARDOUS DEBRIS IS SUBJECT TO THE ALTERNATIVE TREATMENT STANDARDS OF 40 CFR 268.45.

C. THIS RESTRICTED WASTE CAN BE LAND DISPOSED WITHOUT TREATMENT. I certify under penalty of law that I personally have examined and am familiar with the waste through analysis and testing or through knowledge of the waste to support this certification that the waste complies with the treatment standards specified in 40 CFR part 268 subpart D. I believe that the information I submitted is true, accurate, and complete. I am aware that there are significant penalties for submitting a false certification, including the possibility of a fine and imprisonment.

D. THIS RESTRICTED WASTE HAS BEEN TREATED TO THE PERFORMANCE STANDARDS. I certify under penalty of law that I have personally examined and am familiar with the treatment technology and operation of the treatment process used to support this certification. Based on my inquiry of those individuals immediately responsible for obtaining this information, I believe that the treatment process has been operated and maintained properly so as to comply with the treatment standards specified in 40 CFR 268.40 without impermissible dilution of the prohibited waste. I am aware there are significant penalties for submitting a false certification, including the possibility of fine and imprisonment.

E. THIS LAB PACK DOES NOT CONTAIN ANY WASTES IDENTIFIED AT APPENDIX IV TO PART 268. I certify under penalty of law that I personally have examined and am familiar with the waste and that the lab pack contains only wastes that have not been excluded under appendix IV to 40 CFR part 268 and that this lab pack will be sent to a combustion facility in compliance with the alternative treatment standards for lab packs at 40 CFR 268.42(c). I am aware that there are significant penalties for submitting a false certification, including the possibility of fine or imprisonment.

F. THIS RESTRICTED WASTE HAS BEEN TREATED TO REMOVE THE HAZARDOUS CHARACTERISTIC AND CONTAINS UNDERLYING HAZARDOUS CONSTITUENTS THAT REQUIRE FURTHER TREATMENT TO MEET THE UNIVERSAL TREATMENT STANDARDS. I certify under penalty of law that the waste has been treated in accordance with the requirements of 40 CFR 268.40 or 268.49 to remove the hazardous characteristic. This decharacterized waste contains underlying hazardous constituents that require further treatment to meet treatment standards. I am aware that there are significant penalties for submitting a false certification, including the possibility of fine and imprisonment.

G. THIS RESTRICTED WASTE HAS BEEN TREATED TO REMOVE THE HAZARDOUS CHARACTERISTIC AND BEEN TREATED FOR UNDERLYING HAZARDOUS CONSTITUENTS. I certify under penalty of law that the waste has been treated in accordance with the requirements of 40 CFR 268.40 to remove the hazardous characteristic and that underlying hazardous constituents, as defined in §268.2(i) have been treated on-site to meet the §268.48 Universal Treatment Standards. I am aware that there are significant penalties for submitting a false certification, including the possibility of fine and imprisonment.

H. THIS RESTRICTED WASTE IS SUBJECT TO AN EXEMPTION FROM LAND DISPOSAL. *(Please include the date the waste is subject to the prohibitions in Column 5)* This waste is subject to an exemption from a prohibition on the type of land disposal method utilized for the waste (such as, but not limited to, a case-by-case extension under 40 CFR Part 268.5, an exemption under 40 CFR 268.6, or a nationwide capacity variance under 40 CFR 269 Subpart C)

I. THIS RESTRICTED WASTE WITH TREATMENT STANDARDS EXPRESSED AS CONCENTRATIONS IN THE WASTE PURSUANT TO 268.43, IF COMPLIANCE WITH THE TREATMENT STANDARDS IN SUBPART D OF THIS PART IS BASED IN PART OR IN WHOLE ON THE ANALYTICAL DETECTION LIMIT ALTERNATIVE IN 268.40(d). I certify under penalty of law that I have personally examined and am familiar with the treatment technology and operation of the treatment process used to support this certification. Based on my inquiry of those individuals immediately responsible for obtaining this information, I believe that the nonwastewater organic constituents have been treated by combustion units as specified in 268.42, Table 1. I have been unable to detect the nonwastewater organic constituents, despite having used best good-faith efforts to analyze for such constituents. I am aware there are significant penalties for submitting false certifications, including the possibility of fine and imprisonment.

J. TREATMENT FACILITIES GENERATING CONTAMINATED SOIL TREATED TO THE STANDARDS IN 268.49.
I certify under penalty of law that I have personally examined and am familiar with the treatment technology and operation of the treatment process used to support this certification and believe that it has been maintained and operated properly so as to comply with treatment standards specified in 40 CFR 268.49 without impermissible dilution of the prohibited wastes. I am aware there are significant penalties for submitting a false certification, including the possibility of fine and imprisonment.

Subcategories

D001 – **Ignitable Characteristic Wastes**, except for the §261.21(a)(1) High TOC Subcategory.

D001 – **High TOC Ignitable Characteristic Liquids Subcategory** based on 40 CFR 261.21(a)(1) – Greater than or equal to 10% total organic carbon (Note: This subcategory consists of nonwastewaters only.)

D002 – **Acidic Subcategory** based on 40 CFR 261.22(a)(1) – It is aqueous and has a pH less than or equal to 2.

D002 – **Alkaline Subcategory** based on 40 CFR 261.22(a)(1) – It is aqueous and has a pH greater than or equal to 12.5.

D003 – **Reactive Sulfides Subcategory** based on 261.23(a)(5).

D003 – **Other Reactive Subcategory** based on 261.23(a)(1).

D003 – **Water Reactive Subcategory** based on 261.23(a)(2), (3), and (4). (Note: This subcategory consists of nonwastewaters only).

D003 – **Reactive Cyanides Subcategory** based on 261.23(a)(5)

D006 – **Cadmium Containing Batteries Subcategory**. (Note: This subcategory consists of nonwastewaters only).

D008 – **Lead Acid Batteries Subcategory**: (Note: This standard only applies to lead acid batteries that are identified as RCRA hazardous wastes and that are not excluded elsewhere from regulation under the land disposal restrictions of 40 CFR 268 or exempted (see 40 CFR 266.80). This subcategory consists of nonwastewaters only.)

D009 – Nonwastewaters that exhibit, or are expected to exhibit, the characteristic of toxicity for mercury based on the toxicity characteristic leaching procedure (TCLP) in SW846; and contain greater than or equal to 260 mg/kg total mercury that also contain organics and are not incinerator residues. **(High Mercury-Organic Subcategory)**

D009 – Nonwastewaters that exhibit, or are expected to exhibit, the characteristic of toxicity for mercury based on the toxicity characteristic leaching procedure (TCLP) in SW846; and contain greater than or equal to 260 mg/kg total mercury that are inorganic, including incinerator residues and residues from RMERC. **(High Mercury-Inorganic Subcategory)**

D009 – Nonwastewaters that exhibit, or are expected to exhibit, the characteristic of toxicity for mercury based on the toxicity characteristic leaching procedure (TCLP) in SW846; and contain less than 260 mg/kg total mercury and that are residues from RMERC only. **(Low Mercury Subcategory)**

D009 – All other nonwastewaters that exhibit, or are expected to exhibit, the characteristic of toxicity for mercury based on the toxicity characteristic leaching procedure (TCLP) in SW846; and contain less than 260 mg/kg total mercury and that are not residues from RMERC. **(Low Mercury Subcategory)**

F025 – Condensed light ends from the production of certain chlorinated aliphatic hydrocarbons, by free radical catalyzed processes. These chlorinated aliphatic hydrocarbons are those having carbon chain lengths ranging from one to and including five, with varying amounts and positions of chlorine substitution. **F025 – Light Ends Subcategory**

F025 – Spent filters and filter aids, and spent desiccant wastes from the production of certain chlorinated aliphatic hydrocarbons, by free radical catalyzed processes. These chlorinated aliphatic hydrocarbons are those having carbon chain lengths ranging from one to an including five, with varying amounts and positions of chlorine substitution. **F025 - Spent Filters/Aids and Desiccants Subcategory**

K069 – Emission control dust/sludge from secondary lead smelting – **Calcium Sulfate (Low Lead) Subcategory**

K069 – Emission control dust/sludge from secondary lead smelting – **Non-Calcium Sulfate (High Lead) Subcategory**

K071 – (Brine purification muds from the mercury cell process in chlorine production, where separately prepurified brine is not used) nonwastewaters that are residues from RMERC - **Residues from RMERC**

K071 – (Brine purification muds from the mercury cell process in chlorine production, where separately prepurified brine is not used.) nonwastewaters that are not residues from RMERC – **Not Residues from RMERC**
K106 – K106 (wastewater treatment sludge from the mercury cell process in chlorine production) nonwastewaters that contain greater than or equal to 260 mg/kg total mercury – **High Mercury Subcategory**

K106 – K106 (wastewater treatment sludge from the mercury cell process in chlorine production) nonwastewaters that contain less than 260 mg/kg total mercury that are residues from RMERC – **Low Mercury RMERC Subcategory**

K106 – Other K106 nonwastewaters that contain less than 260 mg/kg total mercury and are not residues from RMERC. **– Low Mercury Subcategory**

P047 – **4,6-Dinitro-o-cresol**

P047 – **4,6-Dinitro-o-cresol salts**

P065 – Mercury Fulminate nonwastewaters, regardless of their total mercury content, that are no incinerator residues or are not residues from RMERC – **Not Residues**

P065 – Mercury Fulminate nonwastewaters that are either incinerator residues or are residues from RMERC; and contain greater than or equal to 260 mg/kg total mercury – **High Mercury Residues**

P065 – Mercury Fulminate nonwastewaters that are residues from RMERC and contain less than 260 mg/kg total mercury – **Low Mercury RMERC Residue**

P065 – Mercury fulminate nonwastewaters that are incinerator residues and contain less than 260 mg/kg total mercury – **Low Mercury Incinerator Residue**

P092 – Phenyl mercuric acetate nonwastewaters, regardless of their total mercury content, that are not incinerator residues or are not residues from RMERC – **Not Residues**

P092 – Phenyl mercuric acetate nonwastewaters that are either incinerator residues or are residues from RMERC; and still contain greater than or equal to 260 mg/kg total mercury – **High Mercury Residues**

P092 – Phenyl mercuric acetate nonwastewaters that are residues from RMERC and contain less than 260 mg/kg total mercury – **Low Mercury RMERC Residues**

P092 – Phenyl mercuric acetate nonwastewaters that are incinerator residues and contain less than 260 mg/kg total mercury – **Low Mercury Incinerator Residue**

U151 – (mercury) nonwastewaters that contain greater than or equal to 260 mg/kg total mercury – **High Mercury Subcategory**

U151 – (mercury) nonwastewaters that contain less than 260 mg/kg total mercury and that are residues from RMERC only – **Low Mercury RMERC Residues**

U151 – (mercury) nonwastewaters that contain less than 260 mg/kg total mercury and that are not residues from RMERC – **Low Mercury Subcategory**

U151 – All U151 (mercury) wastewaters – **All Subcategory**

U151 – Elemental mercury contaminated with radioactive materials – **Elemental RAM**

LAND DISPOSAL RESTRICTION & CERTIFICATION FORM

Universal Treatment Standards Table

ORGANIC CONSTITUENTS

Ref No.	Hazardous Constituent	WW mg/l	NWW mg/l	Ref No.	Hazardous Constituent	WW mg/l	NWW mg/l
1	Acenaphthene	0.059	3.4	42	2-Chloro-1,3-butadiene (Chloroprene)	0.057	0.28
2	Acenaphthylene	0.059	3.4	43	Chlorodibromomethane	0.057	15
3	Acetone	0.28	160	44	Chloroethane	0.27	6
4	Acetonitrile	5.6	38	45	Chloroform	0.046	6
5	Acetophenone	0.01	9.7	46	p-Chloro-m-cresol	0.018	14
6	2-Acetylaminofluorene	0.059	140	47	2-Chloroethyl vinyl ether	0.062	NA
7	Acrolein	0.29	NA	48	Chloromethane (Methyl chloride)	0.19	30
8	Acrylonitrile	0.24	84	49	2-Chloronaphthalene	0.055	5.6
9	Acrylamide	19	23	50	2-Chlorophenol	0.044	5.7
10	Aldrin	0.021	0.066	51	3-Chloropropylene (Allyl Chloride)	0.036	30
11	4-Aminobiphenyl	0.13	NA	52	Chrysene	0.059	3.4
12	Aniline	0.81	14	274	p-Credisine	0.01	0.66
273	o-Anisidine (2-methoxyaniline)	0.01	0.66	53	o-Cresol (2-Methyl phenol)	0.11	5.6
13	Anthracene	0.059	3.4	54	m-Cresol (3-Methyl phenol)	0.77	5.6
14	Aramite	0.36	NA	55	p-Cresol (4-Methyl phenol)	0.77	5.6
15	alpha-BHC	0.0001	0.066	56	Cyclohexanone	0.36	0.75*
16	beta-BHC	0.0001	0.066	57	o,p`-DDD	0.023	0.087
17	delta-BHC	0.023	0.066	58	p,p`-DDD	0.023	0.087
18	gamma-BHC (Lindane)	0.0017	0.066	59	o,p`-DDE	0.031	0.087
19	Benz(a)anthracene	0.059	3.4	60	p,p`-DDE	0.031	0.087
20	Benzal chloride	0.055	6	61	o,p`-DDT	0.0039	0.087
21	Benzene	0.14	10	62	p,p`-DDT	0.0039	0.087
22	Benzo(a)pyrene	0.061	3.4	63	Dibenz(a,h)anthracene	0.055	8.2
23	Benzo(b)fluoranthene	0.11	6.8	64	Dibenz(a,e)pyrene	0.061	NA
24	Benzo(k)fluoranthene	0.11	6.8	65	1,2-Dibromo-3-chloropropane	0.11	15
25	Benzo(g,h,i)perylene	0.0055	1.8	66	1,2-Dibromoethane (Ethylene dibromide)	0.028	15
26	bis(2-Chloroethoxy)methane	0.036	7.2	67	Dibromomethane	0.11	15
27	bis(2-Chloroethyl)ether	0.033	6	68	m-Dichlorobenzene (1,3-Dichlorobenzene)	0.036	6
28	bis(2-Chloroisopropyl) ether	0.055	7.2	69	o-Dichlorobenzene (1,2-Dichlorobenzene)	0.088	6
29	bis(2-Ethylhexyl) phthalate	0.28	28	70	p-Dichlorobenzene (1,4-Dichlorobenzene)	0.09	6
30	Bromodichloromethane	0.35	15	71	Dichlorodifluoromethane	0.23	7.2
31	Bromomethane (Methyl bromide)	0.11	15	72	1,1-Dichloroethane	0.059	6
32	4-Bromophenyl phenyl ether	0.055	15	73	1,2-Dichloroethane	0.21	6
33	n-Butyl alcohol	5.6	2.6	74	1,1-Dichloroethylene	0.025	6
34	Butyl benzyl phthalate	0.017	28	75	trans-1,2-Dichloroethylene	0.054	30
35	2-sec-Butyl-4,6-dinitrophenol (Dinoseb)	0.066	2.5	76	2,4-Dichlorophenol	0.044	14
36	Carbon disulfide	3.8	4.8	77	2,6-Dichlorophenol	0.044	14
37	Carbon tetrachloride	0.057	6	78	2,4-Dichlorophenoxyacetic acid (2.4-D)	0.72	10
38	Chlordane (alpha and gamma isomers)	0.0033	0.26	79	1,2-Dichloropropane	0.85	18
39	p-Chloroaniline	0.46	16	80	cis-1,3-Dichloropropylene	0.036	18
40	Chlorobenzene	0.057	6	81	trans-1,3-Dichloropropylene	0.036	18
41	Chlorobenzilate	0.1	NA	82	Dieldrin	0.017	0.13

LAND DISPOSAL RESTRICTION & CERTIFICATION FORM

Ref No.	Hazardous Constituent	WW mg/l	NWW mg/l	Ref No.	Hazardous Constituent	WW mg/l	NWW mg/l
83	Diethyl phthalate	0.2	28	124	Iodomethane	0.19	65
84	p-Dimethylaminoazobenzene	0.13	NA	125	Isobutyl alcohol (Isobutanol)	5.6	170
267	2,4-Dimethlaniline (2,4-xylidine)	0.01	0.66	126	Isodrin	0.021	0.066
85	2,4-Dimethyl phenol	0.036	14	127	Isosafrole	0.081	2.6
86	Dimethyl phthalate	0.047	28	128	Kepone	0.0011	0.13
87	Di-n-butyl phthalate	0.057	28	129	Methacrylonitrile	0.24	84
88	1,4-Dinitrobenzene	0.32	2.3	130	Methanol	5.6	0.75
89	4,6-Dinitro-o-cresol	0.28	160	131	Methapyrilene	0.081	1.5
90	2,4-Dinitrophenol	0.12	160	132	Methoxychlor	0.25	0.18
91	2,4-Dinitrotoluene	0.32	140	133	3-Methylchloroanthrene	0.0055	15
92	2,6-Dinitrotoluene	0.55	28	134	4,4-Methylene bis (2-chloroaniline)	0.5	30
93	Di-n-octyl phthalate	0.017	28	135	Methylene chloride	0.089	30
94	Di-n-propylnitrosamine	0.4	14	136	Methyl ethyl ketone	0.28	36
95	1,4-Dioxane	12	170	137	Methyl isobutyl ketone	0.14	33
96	Diphenylamine	0.92	13	138	Methyl methacrylate	0.14	160
97	Diphenylnitrosamine	0.92	13	139	Methyl methansulfonate	0.018	NA
98	1,2-Diphenylhydrazine	0.087	NA	140	Methyl parathion	0.014	4.6
99	Disulfoton	0.017	6.2	141	Naphthalene	0.059	5.6
100	Endosulfan I	0.023	0.066	142	2-Naphthylamine	0.52	NA
101	Endosulfan II	0.029	0.13	143	o-Nitroaniline	0.27	14
102	Endosulfan sulfate	0.029	0.13	144	p-Nitroaniline	0.028	28
103	Endrin	0.0028	0.13	145	Nitrobenzene	0.068	14
104	Endrin aldehyde	0.025	0.13	146	5-Nitro-o-toluidine	0.32	28
106	Ethyl acetate	0.34	33	147	o-Nitrophenol	0.028	13
107	Ethyl benzene	0.057	10	148	p-Nitrophenol	0.12	29
108	Ethyl ether	0.12	160	150	N-Nitrosodiethylamine	0.4	28
109	Ethyl methacrylate	0.14	160	151	N-Nitrosodimethylamine	0.4	2.3
110	Ethylene oxide	0.12	NA	152	N-Nitroso-di-n-butylamine	0.4	17
111	Famphur	0.017	15	153	N-Nitrosomethylethylamine	0.4	2.3
112	Fluoranthene	0.068	3.4	154	N-Nitrosomorpholine	0.4	2.3
113	Fluorene	0.059	3.4	155	N-Nitrosopiperidine	0.013	35
114	Heptachlor	0.0012	0.066	156	N-Nitrosopyrrolidine	0.013	35
115	Heptachlor epoxide	0.016	0.066	264	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	0.000063	0.005
116	Hexachlorobenzene	0.055	10	265	1,2,3,4,6,7,8,9-Octachlorodibenzofluran	0.000063	0.005
117	Hexachlorobutadiene	0.055	5.6	157	Parathion	0.014	4.6
118	Hexachlorocyclopentadiene	0.057	2.4	158	Total PCBs (sum of all PCB isomers, or all Aroclors)	0.1	10
119	HxCDDs (All Hexachlorodibenzo-p-dioxins)	0.000063	0.001	159	Pentachlorobenzene	0.055	10
120	HxCDFs (All Hexachlorodibenzofurans)	0.000063	0.001	160	PeCDDs (All Pentachlorodibenzo-p-dioxins)	0.000063	0.001
261	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	0.000035	0.0025	161	PeCDFs (All Pentachlorodibenzofurans)	0.000035	0.001
262	1,2,3,4,6,7,8-Heptachlorodibenzofluran	0.000035	0.0025	162	Pentachloroethane	0.055	6
263	1,2,3,4,7,8,9-Heptachlorodibenzofluran	0.000035	0.0025	163	Pentachloronitrobenzene	0.055	4.8
121	Hexachloroethane	0.055	30	164	Pentachlorophenol	0.089	7.4
122	Hexachloropropylene	0.035	30	165	Phenacetin	0.081	16
123	Indeno (1,2,3-c,d) pyrene	0.0055	3.4	166	Phenanthrene	0.059	5.6

LAND DISPOSAL RESTRICTION & CERTIFICATION FORM

Ref No.	Hazardous Constituent	WW mg/l	NWW mg/l	Ref No.	Hazardous Constituent	WW mg/l	NWW mg/l
167	Phenol	0.039	6.2	183	2,3,4,6-Tetrachlorphenol	0.03	7.4
266	1,3-Phenylenediamine	0.01	0.66	184	Toluene	0.08	10
168	Phorate	0.021	4.6	185	Toxaphene	0.0095	2.6
169	Phthalic acid	0.055	28	186	Tribromomethane (Bromoform)	0.63	15
170	Phthalic anhydride	0.055	28	187	1,2,4-Trichlorobenzene	0.055	19
171	Pronamide	0.093	1.5	188	1,1,1-Trichloroethane	0.054	6
172	Propanenitrile (Ethyl cyanide)	0.24	360	189	1,1,2-Trichloroethane	0.054	6
173	Pyrene	0.067	8.2	190	Trichloroethylene	0.054	6
174	Pyridine	0.014	16	191	Trichloromonofluoromethane	0.02	30
175	Safrole	0.081	22	192	2,4,5-Trichlorophenol	0.18	7.4
176	Silvex (2,4,5-TP)	0.72	7.9	193	2,4,6-Trichlorophenol	0.035	7.4
177	1,2,4,5-Tetrachlorobenzene	0.055	14	194	2,4,5-Trichlorophenoxyacetic acid/2,4,5-T	0.72	7.9
178	TCDDs (All Tetachlorodibenzo-p-dioxins)	0.000063	0.001	195	1,2,3-Trichloropropane	0.85	30
179	TCDFs (All Tetrachlorodibenzofurans)	0.000063	0.001	196	1,1,2-Trichloro- 1,2,2-trifluoroethane	0.057	30
180	1,1,1,2-Tetrachloroethane	0.057	6	197	tris-(2,3-Dibromopropyl) phosphate	0.011	0.1
181	1,1,2,2-Tetrachloroethane	0.057	6	198	Vinyl chloride	0.27	6
182	Tetrachloroethylene	0.056	6	199	Xylenes -mixed	0.32	30

INORGANIC CONSTITUENTS

Ref No.	Hazardous Constituent	WW mg/l	NWW mg/l
200	Antimony	1.9	1.15
201	Arsenic	1.4	5
202	Barium	1.2	21
203	Beryllium	0.82	1.22
204	Cadmium	0.69	0.11
205	Chromium (Total)	2.77	0.6
206	Cyanides (Total)	1.2	590
207	Cyanides (Amenable)	0.86	30
208	Fluoride	35	NA
209	Lead	0.69	0.75
210	Mercury (retort residues)	NA	0.2
211	Mercury (all others)	0.15	0.025
212	Nickel	3.98	11
213	Selenium	0.82	5.7
214	Silver	0.43	0.14
215	Sulfide	14	NA
216	Thallium	1.4	0.2
217	Vanadium	4.3	1.6
218	Zinc	2.61	4.3

RE-APPROVAL NOTICE AND/OR CHARACTERIZATION CHANGES

Customer Account: _____ Date:_____

Name _____

Company _____

Address _____

Address _____

City, State Zip _____

Thank you for selecting EQ as your environmental management partner. In the event that a waste stream has changed, the generator may use this form to amend and/or re-approve the waste profile.

Generator Name: **EPA ID No.:**

Waste Common Name:
Waste Code(s):

Approval No.: Expiration Date:
EQ Facility Name & ID Number:

Approval No.: Expiration Date:
EQ Facility Name & ID Number:

Approval No.: Expiration Date:
EQ Facility Name & ID Number:

Please select one of the following options:

- ❑ Re-approval with No Process Change
- ❑ Re-approval with Process Change
- ❑ Process Change

Please provide a detailed description below of the changes to the waste stream:

_____

_____

_____

I certify that all information (including attachments) is complete and factual and is an accurate representation of the known and suspected hazards, pertaining to the waste described herein. I authorize EQ to add supplemental information to the waste approval file, provided I am contacted and give verbal permission. I authorize EQ to obtain a sample from any waste shipment for purposes of verification and confirmation. I agree that, if EQ approves the waste described herein, all such wastes that are transported, delivered, or tendered to EQ by Generator or on Generator's behalf shall be subject to, and Generator shall be bound by, the Standard Terms and Conditions associated with the original Waste Characterization Report. (The Standard Terms and Conditions are incorporated into the Waste Characterization Report as Page 4.)

Generator Signature: _____ Printed Name: _____

Company: _____ Date: _____

EQ - THE ENVIRONMENTAL QUALITY COMPANY
CHAIN OF CUSTODY RECORD
Telephone: (734) 329-8000 Internet: www.eqonline.com

To: _____ **From:** _____
Address: _____ **Sampler:** _____
_____ **Contact:** _____
Attention: _____ **Phone # :** _____

Profile Number	*Collection Date*	*Sample Description (Matrix, Grab/Composite)*	*# Containers/Type*	*Size*	*Analysis Requested*

Relinquished by: _____ **Date:** _____ **Accepted by:** _____ **Date:** _____

Relinquished by: _____ **Date:** _____ **Accepted by:** _____ **Date:** _____

Relinquished by: _____ **Date:** _____ **Accepted by:** _____ **Date:** _____

Lab Use Only

	Yes	No
Cold Pack		
Headspace		
Intact		

Hazards Associated with Sample

Flammable _____
Corrosive _____
Highly Toxic _____
Other _____

Comments

The electronic version of this document is the controlled version.
Each user is reponsible for ensuring that any document being used is the current version.

STATE OF MICHIGAN SURCHARGE EXEMPTION CERTIFICATION

For assistance in completing this document please call us at 800-592-5489 or visit our website at www.eqonline.com.

This is a certification, pursuant to 324.11108 of Act 451 of 1994 (the Hazardous Waste Management Act) that the hazardous waste identified herein is exempt from the surcharge provided in the Act.

For manifested waste:

Manifest Number(s): _____

EQ Approval Number: _____

For non-manifested waste:

Waste Code(s): _____

Quantity and Units: _____

Date of Disposal or Solidification: _____

This shipment is exempt from the surcharge because the waste is:

- ❑ Ash that results from the incineration of hazardous waste or the incineration of solid waste as defined in part 115.
- ❑ Hazardous waste exempted by rule because of its character or the treatment it has received.
- ❑ Hazardous waste that is removed from a site of environmental contamination that is included in a list submitted to the legislature pursuant to section 20105, or hazardous waste that is removed as part of a site cleanup activity at the expense of the state [*Michigan*] or federal government.
- ❑ Solidified hazardous waste produced by a solidification facility licensed pursuant to section 11123 and destined for land disposal.
- ❑ Hazardous waste generated pursuant to a 1-time closure or site cleanup activity in this state if the closure or cleanup activity has been authorized in writing by the department. Hazardous waste resulting from the cleanup of inadvertent releases which occur after March 30, 1988 is not exempt from the fee.
- ❑ Primary and secondary wastewater treatment solids from a wastewater treatment plant that includes an aggressive biological treatment facility as defined in section 3005(j)(12)(B) of subtitle C of the solid waste disposal act, title II of Public Law 89-272, 42 U.S.C. 6925.
- ❑ Emission control dust or sludge from the primary production of steel in electric furnaces.

Generator Signature_____ Company Name_____

Printed Name_____ Date_____

Attachment A3.B

EQRR Sampling and Analysis Procedures

Water Concentration
Karl Fischer Method

A. Significance and Use

The percent water in a sample is another important factor in determining the proper handling method of a shipment and may result in the rejection of a shipment. Using the results of the water evaluation and other factors, the decision is made whether the shipment is suitable for reclamation, rich fuel blending or lean fuel blending.

The sample is tested for water by adding a known aliquot of sample to the Karl Fischer reaction vessel containing an organic solvent. An amipotentimeter is used to measure the current going between the tow Platinum electrodes. When there is an excess of Karl Fischer Reagent, Containing iodine, a current is present. When water is added to the organic solvents, it reacts with the Platinum electrodes and depolarizes the two proves, and this prevents the current from flowing between the two electrodes. When this occurs, Karl Fischer Reagent is titrated until there is once again a current present between the two electrodes. The specific gravity and density are also determined in the same process.

B. Procedure

1.1 Secure the reaction vessel to the autotitrator by using the threaded ring.

1.2 Press the " " Button until the KF Solvent covers the electrodes in the beaker.

1.3 When initially setting up, press the "RUN" button. When the digital screen flashes a "O", press the "MODE" button until the red dash on the digital screen is above the " " then press "RUN". The drift value should be less than 25.

1.4 Shake the sample thoroughly.

1.5 To determine the specific gravity, place a portion of the sample into a 100-ml graduated cylinder, and drop a hydrometer into the solution. The hydrometer is used to determine the specific gravity of the solution. It is read by looking at the numbers on the paper in the thin section of the glass. If the number is less then 1.00 then it is read as 0.xxx where the xxx represents the number (i.e., if it reads 892 then it is really 0.892) and each small dash is equal to a 0.02 value. If the number is above 1.00, then each small dash is equal to 0.05. The density is determined by multiplying the specific gravity by 8.33.

1.6 When the previous value appears on the digital screen, press the "RUN" button.

1.7 When the digital screen prompts for the weight proceed as follows:

a) If the sample is mostly water, then take an 15 ul aliquot of sample using an Eppendorf pipettor. Multiply 0.015 (aliquot size) times the sample's weight value for the aliquot, and enter this value as the weight (when prompted) and inject the sample into the vessel through the portal on the lid.

b) If the sample is mostly organic and/or inorganic, then take a 0.1-ml aliquot of sample by using an Eppendorf pipettor. Multiply 0.1 (aliquot size) times the sample's specific gravity. This is the sample's weight value for the aliquot, and enter this value as the weight (when prompted) and inject the sample into the vessel through the portal on the lid.

1.8 Press the "RUN" button twice.

1.9 The digital screen will give a % water value when completed.

2.0 When your shift is completed or the reaction vessel needs to be cleaned, push the aspirator into the reaction solution and press the button until the solution is gone. Remove the vessel and clean with alcohol or acetone only.

C. QA/QC

1.1 Tare the digital balance.

1.2 Set the weighing vessel on the balance and tare again.

1.3 Weigh out 0.15 grams of Sodium Tartrate Dihydride (standard).

1.4 Pour the standard into the reaction vessel through the portal on the lid.

1.5 Reweigh the weighing vessel.

Qualitative Solvent Identification Screening
Gas Chromatography Method

A. Significance and Use

The intention of the Gas Chromatography(GC) solvent screening method is to identify the constituents present in liquid samples.

B. Procedure

1.1 Turn power ON to HP Vectra and 5890 GC
1.11 The HP 5890 GC uses a DB-Wax column for the TCD, FID concurrently. The temperature program is set to start at 35 ^{o}C for the first 5 minutes, then raise 10 ^{o}C per minute to 165 ^{o}C and hold that temperature for 2 minutes. It takes 20 minutes to run a sample.

1.2 Select "CHEM-STATION" from the list of icons.

1.3 Select "SOLVENT METHOD" from the list of icons.

1.4 Select Detector A or B on the GC. (A being the TCD, B being the FID)

1.4.1Use TCD if need to determine water content and FID if greater sensitivity is needed

1.5 Turn on the appropriate gases for the detector (TCD is Aux gas and reference, FID is Hydrogen, Air and reference). Check gas gauges for pressure. If there is no pressure, change the appropriate gas cylinder.

1.6 Allow GC oven to warm up. Check temperature by pushing the "Oven Temp" button. Thirty-five is operating temperature.

1.7 Turn on the desired detector by pressing the Detector A or B button, and then the "ON" button. Check for detector signal on the digital display (a reading of 10 is desired). If necessary, light the FID by holding a lighter over the detector.

1.8 Using a Gastight 1 microliter syringe, draw the sample into the syringe numerous times to remove contaminants and air bubbles.

1.9 Draw 0.2 microliter into the syringe.

2.0 Insert the syringe through the septum, and simultaneously inject the sample and press the start button. Check the terminal to see if "RUN IN PROGRESS" is lighted.

2.1 Obtain the print out and compare it with standard previously run using the same procedure. This is a qualitative evaluation

Qualitative PCB Screening Method
Composite Method

A. Significance and Use

The cost and time to conduct a quantitative confirmatory Polychlorinated Biphenyl (PCB) analysis on each waste stream received at EQRR is prohibitive. Instead a qualitative evaluation of a sample made of a composite of 10 waste stream samples is made and a procedure similar to SW-846 Method 8080 is conducted on the composite sample. If this method indicates that PCB's may be present in the sample, each of the composited waste streams is evaluated for PCB's. Those indicating a positive screening are then shipped to an off-site laboratory for quantitative confirmation. This procedure describes the method used to composite the samples and extract the composite.

B. Procedure

1.0 Prepare composite Sample

1.1 Using a new 500-ml sample jar add 10 ml of each waste stream, up to 10 waste streams per jar.

1.2 Mix composite sample well by shaking

2.0 Prepare extract

2.1 Weigh out approximately 0.2 grams of the mixture in a new 40-ml vial

2.2 Add 20 ml of hexane to the mixture

2.3 Add 5 ml of sulfuric acid to the mixture

2.4 Mix waste, hexane, and sulfuric acid mixture well by shaking vial.

2.5 Allow to phase out. (Approximately 1 minutes)

2.6 Pour the top phase into a glass syringe and dispense through the SPE cartridge containing florisil into a sample vial.

2.7 Inject 0.15 microliter from the sample vial into the GC

3.0 Confirmation of a positive screening

3.1 If a pattern is representing PCB's is present, obtain all the samples that were used to make the composite. Follow steps 3-9 for each sample.

3.2 Once the suspicious PCB sample is identified, the sample is sent off site for quantitative confirmation using Method 8080.

EQ RESOURCE RECOVERY, INC.
STANDARD OPERATING PROCEDURE

TITLE: COMPATIBILITY AND REACTIVITY SCREENING OF WASTE MATERIAL (Based On ASTM D-5058)

SOP Number: QES-S-LP-050-EQR
Effective Date: 11/16/07
Revision Number: 5.0
Revision Date: 11/16/07

OBJECTIVES:

The prevention of an unexpected reaction between two or more hazardous waste streams considered for commingling.

1. SCOPE AND APPLICATION

1.1 This method provides an assessment of the compatibility and reactivity of waste materials. There are three screening levels developed by this method. They are as follows:

Test A - Commingled Waste Compatibility
Test B - Polymerization Potential (Reaction with Triethylamine)
Test C - Water Compatibility

1.2 This method is applicable to waste liquids, sludges, semi-solids, and solids. Screening Tests are primarily a qualitative technique that are designed to efficiently give the user specific information about a waste that will aid in determining waste identification, process compatibility, and safety in handling.

1.3 The Commingled Waste Compatibility Test method can be used in determining the compatibility of hazardous wastes before they are commingled. This test will be completed for wastes that will be placed into storage tanks for the fuel blending and solvent reclaim processes.

1.4 The Polymerization Potential Test is designed to screen wastes that have the potential of undergoing hazardous polymerization when mixed with incompatible waste streams. This test method can be used to detect potential hazardous polymerization of waste containing or suspected of containing isocyanates such as methylene bis-phenyl isocyanate, methylene diisocyanate (MDI), or toluene diisocyanates (TDI). This test will

be completed for wastes that will be placed into storage tanks for the fuel blending process only.

1.5 The Water Compatibility Test is used to determine whether a waste has the potential to generate extreme heat or violent reactions, and produce fumes, dusts, gases, or other products when mixed with water. This test will be completed for wastes that will be placed into storage tanks for the fuel blending and solvent reclaim processes.

Procedure

2.1 Commingled Waste Compatibility

2.1.1 Apparatus Required

Graduated Cylinder 100 ml
Thermometer 20° to 100° C or equivalent (with 0.5° C divisions minimum)
Disposable Pipette
Spatula
Beakers 500 ml
Funnels
Vortex Mixer (optional)

2.1.2 Determine the total quantity (A) of the incoming waste stream to be added to the storage or treatment unit.

2.1.3 Determine the total quantity (B) of the waste in the storage or treatment unit.

2.1.4 The total volume of A and B, upon mixing should not exceed 300ml. The initial volume of A (150ml) can be adjusted proportionally to accommodate the total volume limit. (**Warning** – Perform a pretest using 2 ml of each waste when mixing potentially highly reactive wastes)

2.1.5 Place in a 500ml beaker 150 ml of a representative sample from the storage tank or treatment unit.

2.1.6 Measure and record the temperature of the test sample and remove the thermometer.

2.1.7 Use the ratio A+B of wastes to determine the aliquot, V_I, of incoming waste to now be added. Use the following equation:

$$V_I = V_T(A/B)$$

Where V_T is the tank volume used in step 2.1.5, and A and B are as defined in 2.1.2 and 2.1.3 respectively.

2.1.8 Slowly and carefully add the aliquot V_I of incoming waste to the test sample volume V already in the beaker.

2.1.9 The Recommended rate of addition is approximately 1 ml/s.

2.1.10 While the addition is in progress, watch for adverse reactions. (**Warning** – If a reaction is observed, stop the addition immediately and report the observation)

2.1.11 If after adding the aliquot V_I of incoming waste no adverse reaction is observed, mix well and measure and record the temperature.

Note: Mixing the waste samples at equal proportions can increase the sensitivity of reactivity and may be used in addition to the test based on actual proportions.

2.1.12 Compare the temperature measured here with the temperature measured in step 2.1.6. Record the difference, using (+) to indicate an increase and (-) to indicate a decrease in temperature.

2.1.13 Record any generation of heat, or violent reaction. Record the production of any mists, fume, dust, or gases. Any layering polymerization, precipitation, emulsification, increase in viscosity, bubbling, foaming, solidification, spattering, or other interaction of the commingled wastes must be observed and recorded.

2.1.14 If after 10 minutes no reaction or unexpected temperature change is observed the waste passes the compatibility test. If any reaction or unexpected temperature change greater than 10° C is observed the incoming waste has failed the compatibility test and is reported.

2.2 <u>Polymerization Potential (Reaction with Triethylamine)</u>

2.2.1 Apparatus

White ceramic spotplate
Disposable transfer pipettes
Spatula
10-ml graduated cylinder, with stopper
Thermometer 20° to 110° C or equivalent, with 0.5° C divisions minimum

2.2.2 Reagents and Materials

Triethylamine Reagent (CH) N

2.2.3 Place approximately 1ml of sample in the cavity of a ceramic spotplate. Lower the sash hood as protection from violent reactions that may occur during the next steps.

2.2.4 Add slowly (drop by drop) approximately 1 ml of triethylamine reagent to the spotplate cavity with the sample.

2.2.5 Observe the mixture for 1 minute and record any reaction characteristics, such as gas evolution, fuming, charring, precipitation, gelling, polymerization, or burning.

2.2.6 If any reaction characteristics are observed, then material is reactive and fails this test. **Note - waste that fails this part should not be evaluated any further in this procedure**.

2.2.7 Add 5ml of Triethylamine reagent to a 10ml graduated cylinder or test tube. Measure and record the temperature of the triethylamine.

2.2.8 Carefully add 5 ml of waste sample to the cylinder and insert stopper. Invert several times to mix well. Remove stopper and measure and record temperature.

2.2.9 Continue to monitor the temperature of the mixture for 5 minutes. Observe and record any reaction characteristics, such as temperature increase, gas evolution, or gelling. Gas evolution may be observed as tiny bubbles that consistently rise to the surface.

2.2.10 Compare the final measured temperature with that recorded in step 2.2.7. If an unexpected temperature change of more than 10° C occurs or any reaction characteristics are observed, then the waste is reactive and fails this test.
Note - waste that fails this part should not be evaluated any further in this procedure.

2.2.11 If gas evolution is difficult to observe during the previous steps, conduct the following procedure with special care under a fume hood.

2.2.12 Add 5ml Triethylamine Reagent to a 10ml graduated cylinder or disposable test tube.

2.2.13 Carefully add 5ml of waste sample to the cylinder, insert stopper and invert several times for mixing. Remove stopper and reinsert. Close sash as protection against violent reaction.

2.2.14 After 5 minutes, carefully remove the stopper and observe mixture for gas evolution. Gas bubbles will be observed as immediate venting bubbles at the surface, similar to opening a carbonated drink.

2.2.15 If gas evolution is observed, then the waste is reactive and fails this test. If no gas evolution or other signs of reaction are observed, the waste material passes this test.

2.2.16 Record all observations.

2.3 Water Compatibility Test

2.3.1 Apparatus

Disposable Beaker
Disposable Pipette
Spatula
Thermometer 20° to 110° C or equivalent with 0.5° C divisions

2.3.2 Reagents and Materials

Reagent Water

2.3.3 Keep thermometer in water at room temperature until ready for use. Note temperature of thermometer prior to test.

2.3.4 Bring waste sample to room temperature if different.

2.3.5 Place 10 ml of water into disposable beaker or test tube.

2.3.6 Add 1ml of waste sample to be tested. Note any reactions, fumes, dusts, gases, and any precipitation or emulsions. Record any observations.

2.3.7 If any reactions are observed the waste fails this test.

2.3.8 Once it is determined that no reactions are occurring, and as soon as possible, place the thermometer into the beaker and note any temperature change. Record any temperature change noted.

2.3.9 Retain the sample for 10 minutes, then observe and record temperature again.

2.3.10 If any reaction or unexpected temperature change greater than 10° C is observed the incoming waste has failed the water compatibility test and is reported.

2.3.11 Record the miscibility and apparent density of the sample as immiscible or miscible and lighter or heavier than water.

3. Health, Safety and Environmental

CAUTION: These procedures must be performed in a laboratory fume hood with the sash lowered as far as possible or a shield must be in place.

CAUTION: If there is prior knowledge that a waste is potentially highly reactive, reduce the sample volumes to 2ml of each material to be tested to reduce the risk during mixing.

By keeping sample size small and by first screening for very reactive wastes, the overall hazard of this test is small. With samples that do not contain any reactive compounds, this test procedure does not present any other special hazard. However, samples that contain reactive compounds will fail this test and may react with heat, gassing, spattering, or flame.

4. Protective Equipment Required:

- Specific Materials Handled:
- Respiratory Protection: Laboratory Fume Hood with Sash Lowered
- Body/Arm/Leg Protection: Sleeved Lab Coat or Apron
- Hand Protection: Chemical Resistant Gloves
- Eye Protection: Safety Glasses
- Face Protection: Laboratory Fume Hood with Sash Lowered
- Head Protection: Hard Hat
- Hearing Protection: NA

Attachment A3.C

EQ Quality Assurance Management Plan

EQ - THE ENVIRONMENTAL QUALITY COMPANY

Standard Operating Procedure (ALL)

Document Number:	LAB-OP-001-ALL	Issue Date:	4/18/12
Author:	J. Davis, K. Revels	Revision Date:	5/1/13
Job Title:	Lab MS Supervisor	Department:	LAB

TITLE: Quality Assurance Management Plan

PURPOSE: The purpose of this Quality Assurance Management Plan (QAMP) is to provide a description of EQ's Quality Assurance (QA) Program with respect to policies, organization, objectives, functional responsibilities and procedures designed to ensure that environmental measurement efforts result in valid, defensible data of known quality.

EQ has modeled its plan along EPA guidelines as presented in Guidelines and Specifications for Preparing Quality Assurance Program Plans, QAMS-004/80, EPA-600/8-83-024, and Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans, QAMS-005/80, EPA-600/4-83-004. These documents have been published by EPA's Office of Monitoring Systems and Quality Assurance, Office of Research and Development. Additional quality control (QC) elements from Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, Third Edition have also been incorporated into the plan.

SCOPE: The QAMP applies to all EQ Laboratories that provide analytical results as part of the waste characterization process. The QAMP is designed to monitor and control the quality of data generated in support of regulatory testing requirements. As such, operational control laboratories may be exempt from this QAMP as long as all regulatory testing requirements are met through an accredited laboratory and the facility demonstrates that they are following the established EQ Best Management Practices for laboratories. In some cases, a sister EQ Laboratory may be substituted for an accredited laboratory.

RESPONSIBILITIES:

Operations Manager: The site Operations Manager is responsible for all management issues with the Laboratory. Specific duties as required by this protocol are identified in section 4.2.1 of this SOP.

Quality Assurance Chemist: The Quality Assurance Chemist is responsible for the implementation of this program. Specific duties as required by this protocol are identified in section 4.2.2 of this SOP. Labs may delegate QA Chemist

responsibilities to multiple chemists or to the laboratory supervisor in lieu of appointing a single QA Chemist.

Laboratory Supervisor: The Laboratory Supervisor is responsible for ensuring that all employees that report to them follow this protocol. Specific duties as required by this protocol are identified in section 4.2.3 of this SOP.

Laboratory Employees: Laboratory employees are responsible for understanding and following this protocol. Specific duties as required by this protocol are identified in section 4.2.4 of this SOP.

PROCEDURE:

1.0 Objectives

1.1 Demonstration of laboratory capability by providing information which documents the overall qualifications of the laboratory to perform environmental analyses

1.2 Control of operations through the establishment of standard operating procedures for plant and laboratory activities as well as the implementation of QC procedures which measure laboratory performance on a daily basis

1.3 Determination of the effect of the sample matrix on method performance

1.4 Reporting associated QC information with the analytical results to enable the decision maker to assess the quality of the data

1.5 Documentation and archival of all procedural and analytical information.

The procedures associated with the achievement of these objectives are described in this program plan.

2.0 Quality Assurance Policy

The implementation of a comprehensive quality assurance/quality control (QA/QC) program is essential to ensure the generation of scientifically sound, legally defensible data of known and documented quality. EQ is committed to maintaining a QA program which fulfills these goals within the specific requirements of the regulatory agencies which govern environmental measurements. The primary objective of EQ's QA program is to provide

environmental analytical data which are of known quality with respect to: completeness, accuracy, precision, representativeness, and comparability.

EQ will implement this policy by:

a) Disseminating the policy throughout the Laboratory

b) Establishing a procedure to identify and comply with both the spirit and letter of federal, state and local environmental laws and regulations which are applicable to the analytical methods performed by EQ

c) Assigning specific responsibilities and providing assistance to all persons involved in the generation and reporting of analytical data and

d) Establishing a QA program based on clearly defined objectives, well-documented procedures, a comprehensive audit system and management support

3.0 Laboratory Operation

Testing occurs only within the laboratory. Laboratory space is maintained and monitored to the specifications required for laboratory space and the testing performed. Specific work areas are defined and access is controlled. Good housekeeping measures are employed to avoid the possibility of contamination. Work areas include: entries to the laboratory, sample receipt area, sample storage area, laboratory analysis area, chemical and waste storage area, data handling and storage area. Scope of analytical work is described in individual site permits and waste analysis plans.

4.0 Responsibilities and Authorities

This section describes the functional relationships between laboratory organization and the quality assurance function. The lines of authority and responsibilities of key staff members are described along with the interactive role of the quality assurance function. A description of EQ's approach to ensuring that its staff members have the qualifications necessary to perform the required analyses is provided in this section.

4.1 Quality Assurance Organization

EQ has organized the quality assurance function within the company to allow complete independence in program review. A Quality Assurance (QA) Chemist, is in residence for each EQ Laboratory. The QA Chemist reports directly to the Laboratory Supervisor who in turn reports to the Operations Manager.

The position of QA Chemist provides a review of quality issues at all levels of the respective facility and allows immediate access to management and staff members on QA-related matters. The QA Chemist works closely with the Laboratory Supervisor and with the Operations Manager on a day-to-day basis to convey Quality Assurance-related activities and to resolve quality issues.

The implementation of the QA program within each operational area of the Laboratory is the responsibility of the managers and supervisors. It is the responsibility of the QA Chemist to provide independent review of QC activities at the Laboratory level and to provide performance assessment through QA audits. The QA Chemist provides the assurance that the overall quality control system is functioning properly at the operational level. This involves a continuing evaluation of the adequacy and effectiveness of the QC system with a view to having corrective measures initiated where necessary.

4.2 Description of Personal Responsibilities and Authorities

The QC system is an integral part of the daily technical effort providing an overall mechanism for generating data of a specified quality. This involves integrating the quality aspects of several related steps including:

a) The proper specification of program objectives

b) Performance to meet the full intent of the specification

c) Inspection to determine whether the resulting product meets the criteria defined by the specification

d) Review of activities to provide for any necessary revision of the specification.

The successful execution of this process is dependent upon the continued commitment of all members of the organization to a strong and workable QA program. The specific responsibilities and levels of authority within EQ are described in the following subsections.

4.2.1 Operations Manager

4.2.1.1 Membership

Overall management responsibility for the operation of EQ's laboratory resides within the office of the Operations Manager.

4.2.1.2 Responsibilities

The Operations Manager is responsible for:

a) Selecting personnel, placing them in proper positions, training them and evaluating their performance

b) Motivating and directing employee efforts

c) Providing management support for the QA program

d) Organizing the work into discreet elements such that people can be selected and assigned specific responsibilities

e) Monitoring the development and implementation of the QA program

4.2.1.3 Authority

The Operations Manager is the final authority on all management issues within the Laboratory. As such, he/she is ultimately accountable for the successful execution of the analytical work performed and the implementation of the QA program. As a result, he has the authority to suspend or terminate employees for non-compliance with QA policies and procedures.

4.2.2 Quality Assurance Chemist

4.2.2.1 Membership

EQ's QA program resides within the office of the Operations Manager. The QA Chemist has the responsibility for the design and implementation of the program.

4.2.2.2 Responsibilities

The QA Chemist is responsible for:

a) Developing and implementing a Laboratory QA program that ensures that all data generated are technically sound, legally defensible and of known quality

b) Monitoring the QA plan to ensure compliance with specified QA objectives in all operational areas

c) Developing and implementing new QA procedures within the Laboratory to improve data quality

d) Conducting audits and inspections of all operational areas within the Laboratory on a regular basis, reporting the results of those audits to management, and applying corrective actions as needed to ensure compliance with the QA Plan

e) Coordinating the distribution of performance evaluation (PE) samples on a routine basis, evaluating the analytical data resulting from those samples, providing summary reports to management, and applying corrective actions as needed to ensure that analytical results meet the data quality objectives defined in the QA Plan.

f) Serving as the in-house client representative on all inquiries involving data quality issues

g) Establishing data bases that accurately reflect the performance of each operational area

h) Directing the efforts of the Laboratory Supervisors in the implementation of the QA Plan within each operational area

i) Assisting in the prescription and monitoring of corrective actions

j) Monitoring the preparation and verification of analytical standards

k) Assisting chemists in the preparation of SOPs

l) Assuring that the Laboratory staff has access to current SOPs

m) Monitoring laboratory performance in the areas of holding times and report turnaround times

n) Coordinating any external QA audit activities requested by clients or regulatory agencies

o) Promoting sound QA practices within the Laboratory.

4.2.2.3 Authority

The Site Manager has the authority to require that procedures be amended or discontinued or analyses suspended or repeated, however the QA Chemist may point out deficiencies and make recommendations with respect to any issues related to data quality. The QA Chemist can also make recommendations regarding suspension or termination of employees for non-compliance with QA policies and procedures. The authority of the QA Chemist comes directly from the Site Manager and Lab Supervisor.

4.2.3 Laboratory Supervisor

4.2.3.1 Membership

The Laboratory Supervisors who direct the generation and reporting of analytical data are directly responsible for ensuring that all employees reporting to them are complying with the QA Plan. The Laboratory Supervisors report directly to the Operations Manager.

4.2.3.2 Responsibilities

EQ's Laboratory Supervisors are responsible for:

a) Providing all available safety information related to the materials and equipment utilized in the laboratory to their subordinates

b) Actively supporting the implementation of the QA Plan within each of the operational areas

c) Maintaining accurate SOPs and enforcing their use within each area

d) Maintaining a work environment that emphasizes the importance of data quality

e) Providing management support to the QA Chemist

f) Providing sufficient project background information to their subordinates such that the work performed will meet the client's requirements

g) Providing guidance to their subordinates in the selection of methodology and interpretation of results

h) Reviewing completed work and monitoring check sample and proficiency sample analyses

i) Assisting in the orientation and training of new employees

j) Recommending training for more experienced staff members

k) Conducting performance reviews

4.2.3.3 Authority

EQ's Laboratory Supervisors have the authority to accept or reject data based on compliance with well-defined and documented QC criteria. Circumstances involving the rejection of data must be well-documented and any corrective action needed must be identified and initiated. The authority of EQ's Laboratory Supervisors comes directly from the Operations Manager.

4.2.4 EQ Laboratory Personnel

4.2.4.1 Membership

All Laboratory personnel involved in the preparation, generation or reporting of data have a responsibility to understand and follow the QA Plan.

4.2.4.2 Responsibilities

EQ laboratory personnel are responsible for:

a) Reviewing and understanding the available safety information associated with the reagents, standards, chemicals and equipment with which they work

b) Possessing a functional understanding of the scientific principles associated with the laboratory procedures which they routinely perform

c) Recognizing potential sources of error and communicating this information to management

d) Having a thorough working knowledge of and proficiency with the equipment employed in their work

e) Having a working knowledge of the QA Plan

f) Ensuring that all work is generated in compliance with the QA Plan

g) Performing all work according to written SOPs

h) Ensuring that all documentation related to their work is complete, accurate and legible

i) Providing management with immediate notification of quality problems

4.2.4.3 Authority

Laboratory personnel have the authority to reject data based on compliance with clearly-defined and documented QC criteria. The rejection of data that fall outside of established QC guidelines must be reported on Corrective Action Reports. The authority of the Laboratory personnel originates from the Laboratory Supervisors and the Site Manager.

4.3 Personnel Qualifications and Performance Records

EQ assures that all personnel performing tasks and functions related to data quality have the appropriate qualifications through the use of well-defined

recruiting criteria, a formal orientation program for new employees, the provision of training on an ongoing basis to existing staff members and method proficiency testing. Employee records such as laboratory training, performance capabilities, job function/authority, and ad hoc corrective actions are retained by the site Management Representative (MR). Employee records such as resumes/applications, disciplinary activity, overall job performance and dates of employment are retained by EQ's Human Resource Department at EQ Corporate.

4.3.1 Education, Training and Experience

EQ has established factors which qualify an individual for a given activity or function for each position within the Laboratory. Typically, these factors include education, work experience, special skill requirements and level of responsibility. These elements have been incorporated into formal position descriptions which provide the following:

a) Title

b) Minimum qualifications (education and work experience)

c) Organizational reporting requirements

d) Summary description of the position and

e) Specific responsibilities

Once hired, new employees are provided a formal orientation program. This training is provided on a one-on-one basis by appropriate representatives from the following areas: administration, QA, and laboratory management. The administrative aspect of the orientation covers areas such as time sheets, pay periods, personnel policies, benefits, and organizational structure (EQ Employee Handbook HM-OP-002-ALL). The QA aspect is conducted by the QA Chemist and covers the introduction of the employee to this SOP and the specific QC procedures for which the employee will be responsible. The laboratory aspect is conducted by the employee's immediate supervisor or other qualified chemists. This portion of the orientation will cover the specific operational activities for which the employee will be responsible and will include detailed instruction in laboratory safety (Chemical Hygiene Plan QES-PR-025-ALL) and the relevant analytical SOPs.

EQ provides training on an ongoing basis to existing employees. The first aspect of this stage of training is designed to correct technical deficiencies identified in the performance evaluation process. The second aspect consists of

developmental training designed to enhance the laboratory's existing capabilities or to add new capabilities. Both of these areas utilize the following methods:

a) On-the-job training

b) Programmed learning

c) Specialized training by instrument manufacturers

d) University courses

4.3.2 Proficiency Testing

All analysts are required to demonstrate proficiency in a given analytical methodology. The procedure for demonstration of capability (DOC) is outlined in the DOC SOP (LAB-OP-003-ALL).

In addition to DOC laboratories demonstrate there proficiency through quarterly performance evaluations. See Section 11.

4.3.3 Ethics Policy

No employee shall knowingly manipulate or falsify data. No employee shall knowingly deviate from the quality assurance requirements established for the laboratory, including this document. All employees shall make every effort to minimize the generation of waste during sample preparation and analysis, and will dispose of all waste following established laboratory practices. EQ will make all necessary information available to the employee to perform job responsibilities according to ethical and established practices.

5.0 Sampling Procedures

This section of the QA Plan describes the sampling procedures to be employed by EQ in the collection of samples to be submitted to the laboratory for environmental analyses. The generation of quality data begins with the collection of a representative sample. As a result, the integrity of the sample collection process is of concern to the laboratory. Samples must be collected in such a manner that no foreign material is introduced into the sample and no parameters of interest are lost from the sample prior to analysis. To ensure sample integrity, the following elements must be considered:

a) Samples must be collected according to a prescribed sampling plan that has been documented in writing in the form of a detailed site-specific sampling SOP.

b) Samples must be collected in appropriate containers

c) Sample containers must be new or properly cleaned prior to use to ensure that the sample is not contaminated during the collection process

d) Samples must be preserved in a manner that minimizes the loss of target parameters through adsorption, chemical or biological degradation, or volatilization

e) Appropriate volumes of samples must be collected to ensure that the required detection limits can be met and quality control samples can be generated and analyzed

f) Samples must be properly labeled, sealed and accompanied by the appropriate chain-of-custody documentation when necessary

5.1 Sampling Procedures

The purpose of sampling is to obtain materials that represent a larger population being studied. All aspects of a sampling program must be planned and documented in detail. A sampling program must include reasons for selecting sampling locations, the timing of sample acquisition and the accepted level of variability due to heterogeneity of the source material. A detailed description of sampling sites and procedures is necessary and should include methodology, labeling, container preparation, storage and pretreatment procedures. At a minimum, an acceptable sampling program should include the following:

a) A proper statistical design which takes into account the goals of the study and its uncertainties

b) Instructions for sample collection, labeling, preservation and transport to the analytical laboratory

c) Training of personnel in the specified sampling techniques and procedures

The sampling strategy must be designed to yield the type and quality of data required for the environmental monitoring program. In general, the number of samples and the type of sampling procedure must be defined to ensure the reliability of the final results.

5.2 Sample Containers

Sample containers and storage procedures must be consistent with the chemical and physical properties of the parameters to be analyzed. It must be demonstrated that these do not alter the composition of the sample in a way that would affect the concentration of the target analyte being determined. Special

storage and transportation requirements such as refrigeration and protection from light must be specified.

In general, glass or inert plastic containers are used for organic parameters and polyethylene containers are used for inorganic and metal parameters. A detailed site-specific sampling SOP for treated waste that addresses the specific sampling requirements. Representative samples are collected from each plant treatment batch.

5.3 Holding Times

The U.S. Environmental Protection Agency (EPA) has established holding time requirements for certain determinations. These holding time requirements differ depending on the specific regulatory program. EQ follows the holding times specified in SW-846, Third Edition, Revision 1 and those specifically described in the site's Waste Analysis Plan.

1) Inorganic/Metals must be extracted within 180 days of the sampling date and analyzed within 360 days; except mercury which must be extracted in 28 days and analyzed within 56 days.

2) Cyanide analyses must be completed within fourteen days of the sampling date.

3) Volatile organic analyses must be completed within fourteen days of the sampling date.

    i) EQ Site 2 subscribes to the more stringent holding time of seven days for treatment tank samples as laid out in the site WAP. Samples for volatile organics are refrigerated at 4-degrees Celsius (°C) until analyzed.

4) Semi-volatile organic extractions must be completed within fourteen days of the sampling date. Analysis of the extracts must be completed within forty days.

    i) EQ Site 2 subscribes to the more stringent holding time of seven days for treatment tank samples as laid out in the site WAP. Samples for semi-volatile organics are refrigerated at 4-degrees Celsius (°C) until analyzed.

On occasion, a sample must be reanalyzed to comply with the requirements of this QA Program Plan. If this situation is necessitated by a laboratory problem such as a sample lost through spillage or the improper execution of an analytical procedure, the re-preparation and/or analysis of the sample must occur within the prescribed holding time.

6.0 Sample Custody

A stringent chain-of-custody system is an essential element in assuring the future usefulness of measurement data. There must be a documented, traceable link between any given measurement and the sample and parameter which it is reported to represent. Without this link, it cannot be proven with any certainty that the measurement in question actually represents a condition which did indeed exist at the specified time and place. The chain-of-custody system must provide a definitive link between the program results and the measurement parameters involved. It must provide a documented history of each sample. This must represent a legally-defensible record which covers all aspects of the pre-sampling preparation, sample collection and the post-sampling handling, transportation, storage and analysis process. This record must originate with the preparation of any sample containers which are used on a given project and should provide an indication of all personnel involved with samples and the dates and times of their involvement through final disposition of the samples. The custody procedures must provide assurance that the integrity of the sample is maintained throughout the course of the collection, handling and analysis process. The custody procedures must ensure that there is no opportunity for inadvertent contamination of or intentional tampering with the samples. Without documented chain-of-custody, sample data are subject to question.

In general terms, sample custody is an organized scheme for documenting sample history and providing a legal record of the measurement process. This system of documentation is one aspect of the overall internal quality control system. The types of documentation which are typically associated with environmental measurement programs include:

a) Dated instrument hard copy (strip chart records, chromatograms etc.)

b) Analytical data sheets

c) Raw analytical data such as notebook entries, dated and signed

d) Summary data sheets

e) Sample log books

f) Records of maintenance activities

g) Records of equipment and apparatus calibration

h) Records of audit activities

i) Chain-of-custody records

j) Records of deviations from and/or modifications to any measurement protocol

While all of the above listed documentation comprise the definitive record of the measurement process, some aspects of this record keeping process, such as equipment calibration and maintenance records, are more appropriately discussed elsewhere. The general aspects of EQ's sample control system are presented in the following subsections.

6.1 Sample Documentation

The primary mechanism for ensuring that all necessary information is recorded for each post treatment sample collected is the use of batch tickets as outlined in a site-specific form. In addition, each sample is labeled in a manner that provides the following field information:

a) Sample source

b) Sample description

c) Date and time of sample collection

6.2 Laboratory Operations

Upon receipt by EQ's Laboratory, samples proceed through an orderly sequence specifically designed to ensure continuous integrity of both the sample and its documentation.

6.2.1 Sample Procurement

All samples are received by the designated sample custodians. At the time of sample receipt, the custodians' general responsibilities are as follows:

a) Ensuring proper storage of the samples until analysis is initiated

b) Inspecting and documenting the physical condition of the sample

c) Reviewing the sample label information for completeness and agreement with the Batch Log or Chain-of Custody forms

d) Labeling the sample with tracking number information if needed

6.2.2 Sample Management

The Laboratory will also monitor:

a) The temperature of the sample storage areas in the laboratory with a NIST traceable thermometer

b) Intra Laboratory Batch records

c) Notifying other departments of the availability of the samples for analysis via EQAI

Once these steps have been completed, the laboratory personnel are responsible for the internal custody procedures associated with the transfer of the samples to the appropriate analytical groups for preparation and/or analysis and their subsequent return to the Sample Control refrigerator. Samples must be returned to the Sample Control Refrigerator as soon as possible following sample preparation. A batch ticket is used to ensure the proper handling, storage and preservation of all treatment samples received by the laboratory. The laboratory personnel are also responsible for the final disposition of the samples after completion of the analyses.

As an additional custody measure, access to EQ's laboratory is restricted to prevent any unauthorized contact with samples, extracts or documentation.

6.3 Sample Disposal

Laboratory samples are disposed in accordance with all pertinent Federal, State and Local regulations. Routinely, samples are disposed by transferring them to the plant processing storage areas where the samples are then processed through the waste treatment operations. Generation, tracking, and disposal of laboratory waste are outlined in QES-PR-025-ALL Chemical Hygiene Plan.

7.0 Calibration Procedures and Frequency

Calibration of an analytical system involves systematic quantification of the system response to an accepted reference standard for the analyte of interest. The calibration procedures and standards used directly influence the validity of the resulting measurement data. Most standard analytical methods specify calibration procedures and requirements. These standard procedures are utilized by EQ whenever possible. When circumstances dictate the use of alternate procedures or when an analytical technique is used for which there are no "accepted" calibration procedures, a calibration protocol is devised and documented prior to initiation of sample analyses. Detailed calibration procedures are presented in the appropriate analytical SOPs.

7.1 Standard/Reagent Preparation

A critical element in the generation of quality data is the purity/quality and traceability of the standard solutions and reagents used in the analytical operations. EQ continually tracks reagents and standard solutions by means of a well-documented corporate SOP for Preparation of Working Solutions (LAB-OP-006-ALL).

To ensure the highest purity possible, all primary reference standards and standard solutions used by EQ are obtained from reliable commercial sources. All standards and standard solutions are recorded in a standard solution log that identifies the vendor, lot number, purity/concentration, preparation date, preparer's name, method of preparation, expiration date and any other relevant information.

Standard solutions are validated prior to use. Validation procedures can range from a check for chromatographic purity to verification of the concentration of the standard using separate standards prepared at a different time or obtained from a different source. Stock and working standards are checked regularly for signs of deterioration such as discoloration, formation of precipitates, volume changes or changes in concentration. Care is exercised in the proper storage and handling of standard solutions and all containers must be labeled as to parameter, concentration, solvent, expiration date and preparation data including the initials of the preparer and date of preparation.

7.2 Instrument Calibration Procedures

Calibration of instrumentation is required to ensure that the analytical system is operating correctly and functioning at the proper sensitivity to meet established reporting or compliance monitoring limits. Each instrument is calibrated with standard solutions appropriate to the type of instrument and the linear range established for the analytical method. The frequency of calibration and the concentration range of calibration standards are determined by the analytical method SOP or other specific requirements.

7.2.1 Gas Chromatography

The field of chromatography utilizes a variety of instrument configurations and detection systems. While calibration standards and acceptance criteria vary depending on the type of system and analytical methodology, the general principles of calibration apply uniformly. Each chromatographic system is calibrated prior to sample analysis. Initial calibration consists of the determination of the linear range, establishing limits of detection and defining retention time windows. The calibration is verified with a standard independent of the calibration on a daily basis to ensure that the system remains within specifications. If the daily calibration verification does not meet established

criteria, the system is recalibrated and samples analyzed since the last acceptable calibration verified are reanalyzed.

7.2.2 Metals

A calibration curve is verified daily for each analyte analyzed by Inductively Coupled Plasma Atomic Emission Spectroscopy (ICP-AES). If the daily calibration verification does not meet established criteria, the system is recalibrated. Immediately after calibration, accuracy is verified by analyzing initial calibration verification (ICV) and continuing calibration verification (CCV) standards. Control limits and frequency are defined in EQ's ICP SOPs. Deionized water is matrix matched to the digestion procedure and used as a blank for the ICP-AES. If the ongoing calibration standard does not meet established acceptance criteria, the system is recalibrated and all samples analyzed since the last acceptable calibration check are reanalyzed. The method of standard additions may be used.

7.2.3 Conventional Analyses

The field of conventional, non-metal analysis involves a variety of instrumental and wet chemical techniques. While calibration and standardization procedures vary depending on the type of system and analytical methodology required for a specific analysis, the general principles of calibration apply universally. Each system is calibrated prior to the initiation of sample analysis. Calibration consists of defining the calibration range, establishing the limits of detection and identifying potential interferences.

8.0 Analytical Procedures

The analyses performed by EQ are driven by regulatory concerns. As a result, the methods routinely used at EQ are those specified by EPA, other federal and state agencies as well as nationally-recognized professional organizations. A summary of the method references utilized by EQ are listed below:

Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act, 40 CFR, Part 136.

Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-020 (revised 1992, 1994).

Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater, EPA-600/4-82-057.

Test Methods for Evaluating Solid Waste, SW-846, 2nd and 3rd Editions (all revisions), Office of Solid Waste and Emergency Response, U.S. EPA.

Standard Methods for the Examination of Water and Wastewater, 18th Edition, American Public Health Association, American Water Works Association, Water Pollution Control Federation, Washington, D.C.(1992).

Methods for the Determination of Organic Compounds in Finished Drinking Water and Raw Source Water, U.S. EPA, Environmental Monitoring Support Laboratory - Cincinnati (September, 1986).

Annual Book of American Society for Testing and Materials Standards, Part 31, Water.

The choice of the method is dependent on the requirements with respect to qualitative certainty, quantitative sensitivity, precision, accuracy and parameter and matrix types. Methods employed by the laboratory on a routine basis are documented as written SOPs. The SOP contains detailed instructions concerning both the use and the expected performance of the method. Prior to their routine application in the laboratory, methods are subjected to a validation process. The general steps followed in the validation process are:

a) Method selection by a senior technical staff member

b) Documentation of the method in the form of an SOP. This includes a summary of the method, detailed description of the analytical procedure, calculation protocols, reporting formats and safety concerns

c) Testing of the method to verify detection limits and linear range, establish reporting limits and precision and accuracy criteria and

d) Definition of data acceptance criteria approved by a senior technical staff member and the QA Chemist

Controlled documents may be found in one of two locations on the L:\drive. For corporate Lab documents go to L:\EQMS Owners Manual\Corporate\09 - Operational Control\LAB- Laboratory. Site-specific documents may be referenced in the site's Master List of Internal Documents and should be found under L:\EQMS Owners Manual\ **site name**09- Operational Control.

9.0 Data Reduction, Validation, Reporting, and Retention

This section summarizes EQ's approach to the management and evaluation of the various data processing and validation steps. The objective of this group of activities is to fully characterize and maintain the integrity of the analytical data such that the data quality objectives for the delisting verification analyses are being met.

9.1 Data Quality Objectives

EQ has established data quality objectives that insure a high degree of accuracy and precision. Every analytical day, the following QC samples are analyzed along with EQ's batch samples:

a) Calibration verification samples

b) Reagent and Method Blanks

c) Matrix Spike and Matrix Spike Duplicate samples

d) QC Check samples

The Quality Control acceptance criteria for the above QC samples can be found in Section 10 of this Quality Assurance Management Plan.

In addition to precision and accuracy, all data generated are checked for representativeness, completeness, comparability, and detection limit vs. regulatory limit.

9.2 Data Reduction and Validation

The data validation process consists of data generation, reduction, and data quality validation.

9.2.1 Level 1, Analyst Review

The primary analyst is the individual responsible for:

a) Generating the analytical data

b) Performing the Level 1 review

Each analyst reviews the quality of his or her work based on an established sets of criteria which can be found in Sections 7,10 & 14 of the QAMP.

The Level 1 review is performed by the analyst prior to submitting the data to the respective Laboratory Supervisors or Secondary Chemist to ensure and validate that the:

a) Sample preparation bench sheets (TCLP, digestion, extraction) are correct and complete

b) Analysis information (sample ID, instrument used, sample size, raw data, etc.) is correct and complete

c) Appropriate SOPs have been followed (which is understood to include sample preparation and analytical requirements)

d) Calibration verification results are within the acceptance limits

e) Method and reagent blank results conform to the established acceptance criteria

f) QC sample results (MS/MSD, QC check samples) conform to the established acceptance criteria

g) Corrective actions taken (if any) are properly documented

h) Analysis bench sheets are completely and correctly filled out

i) Calculations are correct and that the appropriate analytical factors were used;

j) Results are not reported below the MDLs

Once the Level 1 review is satisfactorily completed by the analyst, he/she signs or initials the analysis bench sheets, logs the results into the Laboratory Information Management System (LIMS), and forwards the documents to the Laboratory Supervisor or secondary Chemist who performs the Level 2 review.

9.2.2 Level 2 Review, Laboratory Supervisor/Secondary Chemist

The Supervisor/Secondary Chemist are responsible for:

a) Performing the Level 2 review

b) Maintaining Laboratory QC Summary Report for latter review by the QA Chemist Assistant

The Level 2 review is performed by the Supervisors/Secondary Chemist to ensure and validate that:

a) All documentation is correct and complete

b) The calibration verification data conform to the established acceptance criteria

c) The QC sample results (MS/MSD, QC check, reagent and method blanks) conform to the established acceptance criteria found in EQ SOPs

d) The corrective actions (if any) are appropriate, documented, and have rectified any quality concern

e) All results are calculated correctly

Ideally, the data package submitted by the analyst for Level 2 review should be free from errors. Errors that are found by the Laboratory Supervisors/ Secondary Chemist are documented with Corrective Action Sheets (see section 14.0) and transmitted to the appropriate analyst. The cause of the error is then addressed and corrected. Remediation could include additional training or clarification of procedures to ensure that quality data will be generated by the analyst at the bench.

Once the Level 2 data review is satisfactorily completed the records are maintained for the QA Chemist who performs the Level 3 review.

9.2.3 Level 3 Review, QA Chemist

The QA Chemist is responsible for:

a) Performing the Level 3 review

b) Review the treatment verification QC Summary Report

The Level 3 review is performed by the plant's QA Chemist to insure and validate that:

a) All of the required bench sheets, reports, and QC Summary Reports are complete, correct, and have been submitted and approved

b) The analyses were performed within the prescribed holding times (see Section 5 of the QAMP)

c) The reported results are not below and are consistent with the respective analytical method detection limit (MDL)

d) The calibration verification results conform to the established acceptance criteria

e) The QC sample results (MS/MSD, QC check, method and reagent blanks) conform to the established acceptance criteria

f) The chains of custody or batch tickets are complete to verify that the integrity of the sample custody has been maintained

g) The final Treatment Control Sheet is complete and error free

h) The QA Summary Report is complete and correct

Once all of the analytical results and attendant reports/ documentation have been satisfactorily reviewed by the QA Chemist, he/she documents that the material has been reviewed.

Treated batches and associated documents are maintained by the laboratory. The data package will contain:

a) Treatment Control Sheet

b) Analytical Summary Report

c) Batch ticket

d) Laboratory worksheets for each associated waste stream

9.3 Data Reporting

EQ utilizes a standardized report format which contains the following elements:

a) Sample identification such as location, type of process, and batch date

b) Analytical results for all the required parameters and report date

c) Regulatory limits for each required parameter

d) Reporting limits for each required parameter

9.4 Recordkeeping

Laboratory reports are stored for retrieval on site either in the active or archival files. Supporting raw data is also stored on site either on respective bench sheets or in electronic files. Records are kept for the duration of site operation plus 3 years following closure. In the event EQ facilities should transfer ownership, the purchaser shall be responsible for maintenance of any and all historical records generated before the purchase. In the event EQ terminates business activity, the current owner will retain the responsibility for storage of these historical records. In either event, records will not be lost or destroyed.

9.5 Subcontracting

When the laboratory subcontracts work whether because of unforeseen reasons (e.g. workload, need for further expertise or temporary incapacity) or on a continuing basis (e.g. through permanent subcontracting, agency, or franchising

arrangements), this work shall be placed with a laboratory accredited under NELAP for the tests to be performed or with a laboratory that meets applicable statutory and regulatory requirements for performing the tests and submitting the results of tests performed. The laboratory performing the subcontracted work shall be indicated in the final report and non-NELAP accredited work shall be clearly identified.

9.5.1 Services and Supplies

When the laboratory procures outside services and supplies in support of tests, the laboratory uses only those outside support services and supplies that are of adequate quality to sustain confidence in the laboratory's tests.

9.5.2 Quality Requirements

Where possible, the laboratory only uses suppliers who meet NELAC requirements for critical consumables, supplies, and services which affect the quality of environmental testing and calibration, and maintains records of these evaluations and list those approved.

10.0 Internal QC Checks

10.1 General

An internal quality control (QC) system is a set of routine internal procedures for assuring that the data generated by a measurement system meets prescribed acceptance criteria. These acceptance limits are usually related to data precision, accuracy and completeness. Inherent and implied in this control function is a parallel objective of measuring and defining the quality of the data generated. The procedures associated with this objective are designed to provide a quantitative assessment of data quality again in terms of precision, accuracy and completeness. An additional objective of an internal QC system is to assess the impact of the sample matrix on the data being generated. If the QC results are not within acceptable limits, Corrective Action is initiated by the Analyst.

The control function is accomplished through laboratory performance QC. The daily laboratory performance QC is comprised of:

a) Method and Reagent Blanks

b) Initial Calibration Criteria/ Calibration Verification Criteria

c) QC Check Sample

d) GC/MS tuning criteria (where applicable)

The information obtained from these activities is used to assess daily laboratory performance.

The effect of sample matrix on data quality is addressed through matrix-specific QC. Matrix-specific QC is based on the use of an actual environmental sample for precision and accuracy determinations and commonly relies on the analysis of matrix spikes. In addition, surrogate recoveries are used to monitor the effect of sample matrix on analytical data for organics compounds.

Also, methods of internal quantization may be used. For metals analysis the Method of Standard Additions may be used. For organic compounds internal standards are used for quantization.

Control Charts may be used to monitor the systems performance over time and to compare daily results against EQ's established QC Acceptance Criteria. The Concentrations of the Calibration Verification Standard, QC Check Standard, and MS/MSD Standard can be found in the respective analyte methods.

10.2 Laboratory Performance QC

10.2.1 Blanks

10.2.1.1 Method Blanks

Method blanks are analyzed to assess the level of background contamination which may exist in the analytical system and which might lead to the reporting of elevated concentrations or false positive data. A method blank is analyzed with every batch of samples processed. A method blank consists of reagents specific to the method which are processed through all aspects of the procedure including preparation, sample clean up and analysis steps. The results of the method blank analysis are evaluated, in conjunction with other QC information to determine the acceptability of the data generated for that batch of samples.

The concentration of target analytes in the blank should be below half the reporting limit for that analyte. In practice, however, some common laboratory solvents and metals are difficult to eliminate to the parts-per-billion levels commonly reported in environmental analyses. As a result, criteria for determining blank acceptability must be based on consideration of the analytical methods used, analytes reported, reporting limits and regulatory limits. EQ has adopted the EPA recommended criteria for determining blank concentration levels (SW-846, Chapter 1, November, 1990).

Metals Analysis Method Blanks: For metal analyses, the concentration of target analytes in the blank must be no greater than the Method Detection Limit or 5% of the regulatory limit, whichever is the greatest.

Organic Analysis Method Blanks: For organic analyses, the concentration of target analytes in the blank must be no greater than the Method Detection Limit or 5% of the regulatory limit, whichever is the greatest.

10.2.1.2 Calibration Blanks

For metals, a calibration blank is analyzed. The concentration of the target analytes in the calibration blanks must be no greater than the method detection limit or 10% of the regulatory limit.

If the blank does not meet acceptance criteria the analyst must perform an evaluation of the data to determine the extent and effect of the contamination on the sample results. An attempt to identify the source of contamination must be made and appropriate corrective action must be implemented and documented. Corrective actions may include reanalysis of the blank and/or re-preparation and reanalysis of the blank and all associated samples.

Method blanks are reported with each set of sample results for both organic, metal, and cyanide analysis. Calibration blanks are only reported for metals analyses. The concentration of the target analytes in the method blanks must be no greater than the method detection limit or 10% of the regulatory limit as well. Sample results from the analysis of organic and inorganic constituents are not corrected for blank contamination.

10.2.2 Calibration Criteria

10.2.2.1 Organic Calibration

For organic analyses, the response for any analyte in the initial Calibration Verification Standard must agree within 20% for volatile organic analysis and 30% for semivolatile organic analysis. If this criterion is not met, a new calibration curve must be prepared for that analyte before sample analysis can begin or results cannot be reported for the sample. If this criterion is not met, the system is judged to be out of control.

10.2.2.1.1 Retention Time Windows

For organic SOPs utilizing gas chromatography in the analytical step, all succeeding standards in an analysis sequence must fall within the daily retention time window (±0.06 Relative Retention Time, RTT units) established by the first standard of the sequence. If this criterion is not met, the problem must be identified and corrected and all samples analyzed since the last in-control standard must be reanalyzed.

10.2.2.2 Metals Analysis

A calibration curve or verification of calibration must be performed daily for metals analyses. Calibration Verification Standards (CVS) are incorporated into the run as specified in the respective methods. One of the verification standards must be at or below the regulatory limit. The verification standards response values are also outlined in the respective methods. If these criteria are not met, the instrument must be recalibrated and the CVS must be reanalyzed before sample analysis can begin. The response obtained from continuing calibration verification standards must also meet criteria outlined in the respective methods. If these criteria are not met, the instrument must be recalibrated and the verification standards must be reanalyzed. In addition, all samples analyzed since the last in-control standard must be reanalyzed.

10.2.3 QC Check Samples

A QC Check Sample is a laboratory control sample whose concentration level is near or equivalent to the Calibration Verification Standard but prepared from stock solutions obtained from a different source.

QC Check Standards (except for mercury and cyanide) are not processed through all steps of the analytical method. The QC Check Sample serves as an independent check of the instrument measurement process. The measured results are compared to the known value and are expressed as %-Recovery. The %-Recovery is calculated as follows:

$$\% \text{ Recovery} = (V_{meas}/V_{known}) \times 100$$

Where:

V_{meas} = Measured value
V_{known} = Known value

The daily QC Check Sample results may be evaluated relative to the QC Check Sample Control Chart upper and lower control limits. The control chart is constructed for the QC Check Samples by averaging the data points obtained on successive days. If this method for determining upper and lower control limits is used, at least twenty data points will be utilized to calculate the average value and the standard deviation. The upper and lower control limits will be taken as average values ± two standard deviations with the exception of mercury, cyanide, and the organics which are taken to be three standard deviations. Alternatively percent variance describe in the individual methods may be used.

10.2.3.1 Corrective Actions

If the QC Check Sample results fall out side of the upper and lower control limits, then the out-of-control situation must be investigated. Corrective action could include re-calibrating the system and re-running all of the samples (treatment

residues and MS/MSD) analyzed prior to the recognition of the out-of-control situation. See section 14.0 for specific preventative actions.

10.3 Matrix Specific QC

10.3.1 Matrix Spikes and Matrix Spike Duplicates

The Matrix Spike (MS) and Matrix Spike Duplicate (MSD) are two aliquots of the same environmental sample to which known amounts of analytes have been added and are subjected to the entire analytical procedure.

The results of the MS/MSD analysis are used to evaluate the effect of the sample matrix and the method on the accuracy and precision (reproducibility) of the analysis. The results, expressed as %-Recovery and Relative Percent Difference (RPD), are calculated as follows:

$$\% \text{ Recovery} = ([V_{MS} \text{ or } V_{MSD}] / V_{known}) \times 100$$

$$RPD = [|V_{MS} - V_{MSD}| / \{(V_{MS} + V_{MSD})/2\}] \times 100$$

Where:
$V_{MS/MSD}$ = Measured value of the matrix or matrix spike duplicate
V_{known} = Known value of the spike concentration.

The daily Matrix Spike results may also be evaluated relative to the MS/MSD Control Chart upper and lower control limits. The control chart is made up of Matrix Spike data points obtained by averaging the values of the daily MS and MSD results. The most recent twenty data pairs will be used to calculate the average value and the standard deviation if this method is used to determine upper and lower limits and updated monthly. The upper and lower control limits will be taken to be the average value ± three standard deviations.

Also, the Matrix Spike RPD performance may be evaluated relative to the RPD Control Chart upper and lower control limits. The control chart is constructed in the same manner as the Matrix Spikes except that the average is based on daily single points. The lower control limit for the RPD is taken to be zero.

Alternatively percent recovery and percent reproducibility defined in individual methods may be used.

10.3.1.1 Corrective Actions

The purpose of monitoring the MS/MSD and RPD is to insure that the precision and accuracy of the analytical results are not affected by changes in the matrix and/or method over time.

If the Matrix Spike average value and/or the RPD value falls outside of the three standard deviation window then the corrective action process must be initiated. There are a number of factors that can affect the Matrix Spike and RPD results; some of these factors can easily be determined and quickly corrected, others may require running the entire MS/MSD pair and samples over again.

10.3.2 Organic Surrogate Recoveries

Surrogates are compounds which are chemically similar to the analytes of interest but which are not normally found in environmental samples. Surrogates are added to samples to monitor the effect of the matrix on the accuracy of the organic analysis. Results are reported in terms of percent recovery. If surrogate recoveries fall outside the limits prescribed in the analytical methodologies, the CCV, LCS, and MB must be evaluated. If the CCV, LCS, and MB all show acceptable recoveries, a matrix effect may be indicated.

10.4 Control Charts and Trend Evaluation

It is the responsibility of the QA Chemist to evaluate the performance control charts for all analytes. Appropriate ad hoc corrective actions (see Section 14) should be initiated when unfavorable trends are recognized.

Periodically, a method's performance is improved. When this occurs, the Control Limits may be recalculated.

11.0 Performance and Systems Audits

This section provides a description of the activities associated with conducting in-house Systems and Performance Audits.

A Systems Audit is a review of laboratory operations to verify that the laboratory has the necessary facilities, equipment, staff and procedures in place to generate acceptable data.

A Performance Capability Audit verifies the ability of the laboratory to correctly identify and quantitate analytes in Performance Evaluation Samples of unknown concentrations.

11.1 Systems Audits

A systems audit is an on-site qualitative review of the various aspects of a total analytical operation to assess its overall effectiveness which includes a review of the treatment residue sampling procedures. It represents a subjective evaluation of a set of interactive systems with respect to strengths, weaknesses and potential problem areas. The audit provides an evaluation of the adequacy of the

overall measurement system to provide data of known quality which are sufficient to meet the objectives of the QA program.

The systems audit consists of observations and documentation of all aspects of the sampling, data generation and reporting process. In addition to evaluating analytical procedures and techniques, the systems audit will emphasize review of all record keeping and data handling systems including:

a) Calibration documentation for both instruments and apparatus

b) Completeness of data forms

c) Data review and validation procedures

d) Data archival procedures

e) Sample logging procedures

f) Quality control documentation

g) Preventative maintenance documentation

h) Corrective action reports

A System Audit is performed quarterly by the QA Chemist. The Corrective Action Process (see Section 14) could be initiated as the result of a System Audit.

Unscheduled Systems Audits of specific operational areas may be made on a more frequent basis. The purpose of these audits may be to follow up on problems identified as the result of the data review process or external audits.

11.1.1 System Audit Guidance

The following guidance describes some of the characteristics that will be looked for when the QA Chemist performs the System Audit to insure that the laboratory activities are being performed in accordance with the QAMP and the SOPs. Any discovery made during the course of a System Audit (unless otherwise noted) will be brought to the attention of the Laboratory Supervisors to discuss appropriate corrective action. Further guidance is given in the corporate SOP LAB-OP-004-ALL Lab Quality Assurance Audit.

a) Review of Log Books - Each logbook found will be examined for legibility and completeness, and, to determine if any deviation from standard practices have been noted in the comment column, where appropriate. Supervisors or QA chemists are to review and initial the log books, at

least, monthly. Deviations from acceptance limits, where applicable, will be noted by the QA Chemist.

b) Expiration Dates of Standards - The expiration date on all bottles (vials, etc) containing primary, secondary, stock and working standards will be examined. Labels on the standard are expected to be legible and complete. Any standard found expired will be noted and brought to the immediate attention of the Laboratory Supervisor.

c) Batch Sample Containers - The jars containing the batch samples will be examined to determine that the sample has no air spaces in the jar, the jars are clean and free from debris, and the label is properly filled out. Any deviations will be noted.

d) Refrigerators - All refrigerators used to store delisting batch samples, composite samples, and analytical samples will be examined for cleanliness. All refrigerators are expected to be clean, free from debris, and at the appropriate storage temperature. Any refrigerator and samples contained, therein, found dirty will be noted.

e) TCLP Extractor - The TCLP extractor will be examined for cleanliness and that the rotation rate (30 ± 2 rpm) has been checked. Any deviations will be noted.

f) TCLP Bottles - The TCLP bottles will be examined for cleanliness and cycle-use expiration date. Any bottles found dirty will be cleaned or disposed of.

g) Lab Hygiene and Safety - All laboratories will be examined for general hygiene and safety. All analysts and people in the laboratory are required to wear safety glasses. The laboratories should be expected to be found clean and devoid of "dirty glassware" buildup. Samples should be stored in their proper place. In addition, the Chemical Hygiene and Inspection Reports (QES-FM-10-ALL) will be examined. Any situations of uncleanliness will be noted. Any apparent unsafe conditions will be noted and brought to the immediate attention of the Laboratory Supervisors.

h) Sampling Jar Storage - The batch sample containers (jars), caps and their respective storage unit will be examined for cleanliness. The caps and jars should be clean, free from debris, and dry. The storage unit should be clean and free from debris. Jars, caps and storage unit found dirty will be cleaned or disposed of.

i) Control Chart Review - The QC control sheets for treatment verification analysis will be examined for completeness.

j) Chemical Storage - All chemical and reagent storage space will be examined to insure that the solvents, solutions, and reagents are being stored in their proper container, are in storage cabinets approved for the storage of the materials, and any secondary containment is in place. Any deviations will be noted.

k) Glassware Cleanliness - The glassware (Volumetric flasks, beakers, pipettes, etc.) will be spot checked for cleanliness. All glassware is expected to be clean, free from debris, and dry. Glassware found otherwise will be noted and cleaned or removed.

l) Training Records - The analytical training records and DOC of laboratory staff will be examined to insure that all the records are complete and consistent with the assigned responsibilities of the given analyst. Technicians performing certain analysis are expected to have evidence in their Training files that they have been trained in the techniques. Any deficiencies in the file will be noted.

11.2 Performance Capability Audits

The performance audit represents a quantitative assessment of the measurement data quality. It provides a direct, point-in-time evaluation of the accuracy of the various measurement systems and procedures. This will be accomplished by challenging each system with an accepted reference standard for the parameter of interest.

Performance evaluation (PE) samples are submitted to each laboratory on a quarterly basis by the facility's QA Chemist see SOP (LAB-OP-002-ALL).

The data generated is submitted to the Laboratory Supervisor who will enter the results into Perkin Elmer Lab Works.

The precision and accuracy of the data generated are evaluated against the certified values of the analytes or the prescribed QC limits. An evaluation report is filed.

The results of the evaluation are subsequently reviewed with the participating areas of the laboratory, the Laboratory Supervisors and the Site Manager. The Corrective Action Process (see Section 14) could be initiated as the result of a Performance Evaluation Audit.

The QA Chemist is responsible for submitting these PE samples and maintaining the resulting data base. The Laboratory Management System Supervisor is responsible for initiating the Performance Evaluation Program quarterly.

11.3 Audit Reporting, Review and Remediation

A formal Audit Report will be completed by the QA Chemist. The report details the findings of the System and Performance audits. The results of System and Performance Audits are submitted to and reviewed with the Laboratory Supervisor and Site Manager to categorize the degrees of deficiencies and to establish appropriate corrective actions (see Section 14). The results of the evaluations are subsequently reviewed with the respective facility's Laboratory Supervisors to assure implementation of the corrective action steps and to establish a corresponding timetable for completion.

12.0 Preventive Maintenance

The primary objective of a comprehensive preventative maintenance program is to ensure the timely completion of the laboratory's analytical work. EQ's program is designed to minimize the down time of critical analytical equipment due to component failure. In implementing this program, efforts are focused in three primary areas:

a) Establishment of maintenance responsibilities

b) Establishment of maintenance schedules for major and/or critical instrumentation and apparatus

c) Establishment of an adequate inventory of critical spare parts and equipment

12.1 Maintenance Responsibilities

Maintenance responsibilities for laboratory equipment are assigned to the respective chemist in each operational area. The Laboratory Supervisors and chemist establish maintenance procedures and schedules for each item of critical equipment. Certain responsibilities for specific activities may be delegated to other laboratory personnel. However, Laboratory Supervisors retain the accountability for ensuring adherence to prescribed protocol. In some cases, repairs are made by trained service engineers.

12.2 Maintenance Schedules

A specific schedule is established for all routine maintenance activities. Other maintenance activities may also be identified as requiring attention on an as-needed basis. Manufacturer's recommendations provide the primary basis for the established maintenance schedules and manufacturer's service contracts provide primary maintenance for major instruments. Maintenance activities are documented in a maintenance log which indicates the required frequency for each procedure and provides for dated entries.

12.3 Spare Parts

Along with a schedule for maintenance activities, an adequate inventory of spare parts is maintained to minimize equipment downtime. This inventory emphasizes those parts and supplies which:

a) Are subject to frequent failure

b) Have limited useful lifetimes

c) Cannot be obtained in a timely manner should failure occur

For major pieces of capital equipment, service contracts may be maintained in lieu of a spare parts inventory.

12.4 Cleaning of glassware

In the analysis of samples containing components in the parts per million or billion ranges, the preparation of scrupulously clean glassware is necessary. Failure to do so can lead to a myriad of problems in the interpretation of the final data due to the presence of extraneous contamination. The basic cleaning steps are addressed below. Alternative cleaning procedures can be used if analyses of blanks reflect the removal of contamination.

a) Removal of surface residuals immediately after use with water, alcohol, or solvent

b) Hot tap water soak or rinse to loosen and float most particulate material

c) Hot tap water rinse to flush away floated particulates

d) Soak with an oxidizing agent/detergent to destroy traces of organic compounds

e) Hot tap water rinse to flush away materials loosened by soak

f) Dilute acid rinse to remove detergent for inorganic glassware

g) Distilled water rinse to remove metallic deposits from the tap water

h) Alcohol rinse or oven dry to eliminate any final traces of contaminants if the glassware is for organic analysis.

i) Flush the item immediately before use with some of the same solvent that will be used if the glassware is for organic analysis.

13.0 Specific Routine Procedures Used to Assess Data Precision, Accuracy, Representativeness

The effectiveness of a QA program is measured by the quality of data generated by the laboratory. Data quality is judged in terms of its precision, accuracy, representativeness, completeness and comparability.

13.1 Precision

Precision is a measure of the agreement between a set of replicate measurements without assumption and knowledge of the true value. Precision is assessed by replicate measurements of reference materials or environmental samples. EQ may monitor precision by comparing the RPD between MS and MSD percent recovery measurements with control limits established at three standard deviations from the mean RPD of historical data or method specific control limits. The RPD between two samples may be calculated using the following equation:

$$RPD = [|V_{MS}-V_{MSD}|/\{(V_{MS} + V_{MSD})/2\}] \times 100$$

Where:
$V_{MS/MSD}$ = Measured value of the matrix or matrix spike duplicate

13.2 Accuracy

Accuracy is the nearness of a measurement or the mean of a set of measurements to the true or accepted value. Accuracy can be assessed using standard reference materials or spiked environmental samples. EQ monitors accuracy by comparing percent recovery results from MS/MSD determinations with control limits established at three standard deviations from the mean of historical data or method specific control limits.

The determination of the accuracy of a measurement requires knowledge of the true or accepted value for the parameter being measured. Accuracy may be calculated in terms of percent recovery as follows:

$$\% \text{ Recovery} = (V_{MS/MSD}/V_{known}) \times 100$$

Where:
$V_{MS/MSD}$ = Measured value of the matrix or matrix spike duplicate
V_{known} = Known value of the spike concentration.

13.3 Representativeness

Representativeness is the degree to which data accurately and precisely represents a characteristic of a population, parameter variations at a sampling

point, a process condition or an environmental condition. Analytical data should represent the sample analyzed regardless of the heterogeneity of the original sample matrix.

13.4 Completeness

Completeness is a measure of the amount of valid data obtained from a measurement system compared with the amount that was expected to be obtained under normal conditions.

To be considered complete, the data set must contain all QC check analyses verifying precision and accuracy for the analytical SOP. In addition, all data are reviewed in terms of the regulatory requirements.

13.5 Comparability

Comparability expresses the confidence with which one data set can be compared to another data set measuring the same property. Comparability is ensured through the use of established, standardized and approved analytical methods, consistency in the basis of analysis (wet weight, volume, etc.), consistency in reporting units and analysis of standard reference materials.

14.0 Corrective Action

14.1 General

When errors, deficiencies, or out-of-control situations exist, the QA program provides systematic procedures, called "corrective actions," to resolve problems and restore proper functioning to the analytical system.

Laboratory personnel are alerted that corrective actions may be necessary if situations such as the following exist:

a) QC data (i.e., blanks, spikes, QC check samples) are outside the acceptable limits for precision and accuracy

b) Deficiencies are detected during audits or from the results of performance evaluation samples

c) Inquiries concerning data quality are received from other EQ departments, customers, or regulatory agencies

d) Lab hygiene conditions are not satisfactory

e) Sampling procedures are improper

14.2 Corrective Action Process

The steps in EQ's corrective action system are as follows:

a) Definition of the problem

b) Assignment of responsibility for investigating the problem

c) Investigation and determination of the cause of the problem

d) Determination of the appropriate corrective action

e) Assignment and acceptance of responsibility for implementing the corrective action

f) Implementation of the correction

g) Verification that the corrective action has eliminated the problem and

h) Documentation of the corrective action episode

14.3 Types of Corrective Actions

Corrective Actions are categorized into five types:

14.3.1 Corrective Actions Resulting From Analyst/Bench Level

Corrective action procedures are often handled at the bench level by the analyst who reviews the preparation or extraction procedure for possible errors, checks the instrument calibration, spike and calibration mixes, etc. If the problem persists or cannot be identified, the matter is referred to the Laboratory Supervisors or to the Site Manager for further investigation using the protocol described above. See Corrective Action Form, (MSP-FM-006-ALL).

Corrective Actions taken on the bench level are normally documented on the Inorganic Analysis and Organic Analyses Corrective Action Sheets shown in Figure 14-1.

14.3.2 Corrective Actions Resulting from the Evaluation of Control Charts

Corrective actions can be generated from an evaluation of the various Control Charts used to monitor a method. These evaluations aid in the recognition of the beginning of an unfavorable trend or shift in the performance of the analysis over time. These observed changes, if left unattended, could cause problems at a later time. Normally, these types of corrective actions are initiated by the QA

Chemist. A Corrective Action Summary Report form is to be issued and completed.

14.3.3 Corrective Actions Resulting from System Audits

A System Audit is performed by the QA Chemist on a quarterly basis (see Section 11). Many times a System Audit will identify a practice or condition that is not being followed according to the QAMP or Method SOPs. In addition, lack of Good Laboratory Practices and Safety concerns could be identified in the System Audit. Laboratory Supervisors will be notified verbally by the QA Chemist and a Corrective Action Summary Report Form will be immediately issued.

14.3.4 Corrective Actions Resulting from Performance Capability Audits

Each EQ laboratory analyzes Performance Evaluation Samples to evaluate their ability to accurately analyze the constituents for Treatment Verification. Biases can be identified as a result of these activities. When a bias is identified, the Laboratory Supervisor~~s~~ is notified by either their QA Chemist or Site Manager. The laboratory will investigate the bias and take appropriate corrective action to remediate the problem. A Corrective Action Incident Summary Report is to be issued and completed.

14.3.5 Corrective Actions Resulting From Ad Hoc Evaluations

The Ad Hoc corrective action addresses discoveries made at the Analyst/Bench Level, through System audits, Performance Capabilities results, and Control Chart evaluations. Corrective action may be necessary on any of the items when they are discovered. Ad Hoc corrective actions are customarily issued by either the Laboratory Supervisors or the QA Chemist, or through discovery by any individual involved in the laboratory process. A Corrective Action Summary Report Form is to be issued and completed.

14.4 Documentation of Corrective Actions

Unacceptable conditions identified as the result of any review require the initiation of the Corrective Action Process and all finding must be documented using the Corrective and Preventive Action Procedure (MSP-OP-016-ALL).

A CAS report is normally initiated by Site Management, the Laboratory Supervisor or by the QA Chemist along with an estimated completion date of the corrective action process. This time period is generally one month or less. If this completion time is not possible then a reasonable completion time must be agreed upon by all involved parties. A copy of all initiated and completed CAS reports is sent to the Site Manager.

When the situation is remediated, the final report is submitted to the QA Chemist for review and signature. Copies are sent to all concerned parties when complete.

Figure 14-1 Analysis Corrective Action Report

Analyses Corrective Action Report

Analysts
Date
Method
QC Batch

Sample ID	Problem Identification and Corrective Actions

15.0 Quality Assurance Reports to Management

Effective management of environmental measurement efforts requires timely assessment and review of measurement activities. The reporting system is a valuable tool for judging the overall effectiveness of the QA program. It serves as an instrument for evaluating the program design, identifying problems and trends and planning for future needs. EQ's QA Chemist submits extensive quarterly reports to the Site Manager and Laboratory Supervisors. These reports may include:

a) The results of internal systems audits including any corrective actions taken

b) Performance evaluation scores and commentaries;

c) Results of site visits and audits by regulatory agencies

d) Problems encountered and corrective actions taken

e) Holding time violations for treatment and preapproval samples

f) General comments and recommendations

g) A summary of the QA data audits conducted

The content of these reports is formally reviewed on a regular basis with the personnel involved in the generation and reporting of the data. The purpose of this review is to highlight the areas needing improvement, disseminate general QA/QC information and solicit the input of laboratory staff with respect to procedural and program improvements.

16.0 Laboratory Documentation

Complete and accurate documentation of analytical and procedural information is an essential element of the QA program. The following subsections describe the documentation employed by EQ.

16.1 SOPs

Analytical and QC protocols are documented in SOPs. SOPs are documents that contain detailed information on the requirements for the correct performance of a specific procedure.

The format and document control for these SOPS is presented in the SOP Document Control, MSP-MP-009-ALL.

16.2 Laboratory Bench Sheets

Laboratory bench sheets are used to document information from routine laboratory operations~~,~~ including sample preparation and analysis. Bench sheets are used to ensure that the information is recorded in a complete and organized manner and that the analysis can be reconstructed if necessary. These bench sheets may either be electronic files or bound notebooks.

16.3 Laboratory Notebooks

Laboratory notebooks are used to document information that cannot easily be recorded on the bench sheets. Information typically recorded in laboratory notebooks includes unusual observations or occurrences in the analysis of

samples. Each page in a laboratory notebook is signed or initialed and dated as entries are made.

16.4 Report Files

A report file is created for each daily analysis handled within the laboratory. The report file contains all documents associated with the report including raw data, corrective actions, all QC data associated with the report and a copy of the final report. When a report is complete, all records are retained for the QA Chemist to audit for completeness and then placed into the records retention area to be maintained for the duration of site operations plus three years following closure.

DEFINITIONS:

Accuracy - The nearness of a measurement or the mean of a set of measurements to the true or accepted value.

Action Limit - The concentration of a target compound or interferant that would cause corrective action procedures to be implemented.

Analyte - The specific component measured in a chemical analysis.

Analytical Batch - a group of samples of the same matrix type which are analyzed together using the same method sequence and the same lots of reagents and with the manipulations common to each sample within the same time period or in continuous sequential time periods. For the purpose of this program, an analytical batch will consist of the treatment samples plus a matrix spike, a spike duplicate, blanks, and QC reference standards. Unless defined differently in the specific method QC samples will be run daily or every 20 samples, whichever is more frequent.

ASTM Type II Water/ DI Water - distilled or deionized water having a conductivity of less than 1.0 µmho/cm at 298 K (25oC), a maximum total matter content of 0.1 mg/L, a minimum color retention time of potassium permanganate of 60 minutes, and no detectable amounts of soluble silica.

Bias - a systematic displacement of all the observations in a sample from the true or accepted value or a systematic and consistent error in test results. Bias may be both positive and negative, and several kinds can exist concurrently, so net bias is all that can be evaluated except under special conditions.

Calibration Curve - a relationship of concentrations of known analyte standards against the instrument response to the analyte.

Calibration Verification Standard - an analytical standard that is analyzed to verify the calibration of the analytical system.

Coefficient of Variation - a measure of precision that is calculated as the standard deviation of a set of values divided by the average of the set of values.

Comparability - a measure of the confidence with which one data set can be compared to another. Sample data should be comparable with other measurement data for similar samples and sample conditions. This objective is achieved through the use of standard techniques for the collection and analysis of representative samples and the reporting of analytical results in appropriate units.

Completeness - the percentage of measurements made which are judged to be valid measurements.

Control Chart - a graphical plot of test results with respect to time or sequence of measurement, together with limits within which they are expected to lie when the analytical system is in a state of statistical control.

Control Limit - the limits shown on a control chart beyond which it is highly improbable that a point could lie while the system remains in a state of statistical control.

Data Quality - the totality of features and characteristics of data that bears on its ability to satisfy a given purpose. The characteristics of major importance are accuracy, precision, completeness, representativeness and comparability.

Data Validation - a systematic process for reviewing a body of data against a set of criteria to provide assurance that the data are adequate for their intended use. Data validation consists of data editing, screening, checking, auditing, verification, certification and review.

Duplicate Samples - two individual samples taken from the same source in separate containers and analyzed independently.

Holding Time - the period of time during which a sample can be stored after collection and preservation without significantly affecting the accuracy of the analysis.

Matrix Spike - a quality control sample consisting of an aliquot of the actual sample matrix which has been fortified with a predetermined quantity of stock solutions containing the regulated analytes prior to sample extraction/digestion and analysis. This type of sample is employed to provide a measure of accuracy for the method used in a given matrix.

Method Detection Limit (MDL) - the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix containing the analyte.

Position Description - a detailed statement of the requirements of a position.

Position Qualifications - any quality, knowledge, ability, experience or acquired attributes that fit a person for a particular position.

Performance Audit - a process which assesses the proficiency of an analyst or laboratory by a quantitative evaluation of the results obtained on known test materials.

Practical Quantitation Limit (PQL) - the lowest concentration of a substance that can be measured reliably within specified limits of precision and accuracy during routine laboratory operating conditions.

Precision - the agreement between a set of replicate measurements without assumption or knowledge of the true value. Precision is assessed by means of duplicate/replicate sample analysis.

Preventative Maintenance - an orderly program of positive actions for preventing failure of equipment and ensuring that equipment is operating with the reliability required for quality results.

Quality Assurance (QA) - the total integrated program for assuring the reliability of monitoring and measurement data. It consists of a system of activities to provide assurance that the quality control function is performing adequately.

Quality Assurance Management Plan (QAMP) - an assemblage of management policies, objectives, principles and general procedures outlining the approach utilized by the laboratory to produce data of known and accepted quality.

Quality Control (QC) - the routine application of specific, well-documented procedures for obtaining prescribed standards of performance in the monitoring and measurement process.

Quality Control Check Standard - a sample prepared from an independent standard at a concentration other than that used for calibration but within the calibration range. An independent standard is a standard composed of the regulated analytes prepared from a different source than that used in the preparation of the standards utilized in the calibration curve. The quality control check standard is intended as an independent check of technique, methodology and standards. The frequency of its application is defined in the specific analytical standard operating procedures.

Range - the difference between the maximum and minimum values of a set of values.

RCRA - the Resource Conservation and Recovery Act.

Reagent Blank/ Method Blank - an organic or aqueous solution that is free of target analytes and contains all the reagents in the same volume as used in the processing of the samples. The reagent blank must be carried through the complete sample preparation procedure and contains the same reagent concentrations in the final solution as in the sample solution used for analysis.

Reagent Grade - analytical reagent (AR) grade, ACS reagent grade and reagent grade are synonymous terms for reagents which conform to the current specifications of the Committee on Analytical Reagents of the American Chemical Society.

Regulated Analytes - a specific list of constituents for which a sample or group of samples must be analyzed in order to meet compliance monitoring requirements.

Relative Standard Deviation - the coefficient of variation expressed as a percentage.

Replicate Samples - two aliquots taken from the same sample container and analyzed independently. In the case of volatile organic compound analysis, where it is not possible to take aliquots, duplicate samples must be collected for the replicate analysis.

Reporting Limit - The lowest concentration that can be calculated based on the calibration curve of the instrument.

Representativeness - the degree to which sample data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, or an environmental condition.

Sample - a representative part or a single item from a larger group presented for analysis or shown as evidence of quality. For the purpose of this program, a sample is considered to be any analytical determination exclusive of calibration standards. This definition includes duplicate samples, replicate samples, blanks, matrix spikes, quality control check samples and analytical re-runs.

Standard Operating Procedure (SOP) - an operation, analysis or action whose mechanics are thoroughly prescribed and documented and which is commonly accepted as the usual or normal method for performing certain routine or repetitive tasks.

Surrogates - compounds which are similar to the target analytes in chemical composition, extraction efficiencies and chromatographic properties but which are not usually found in environmental samples. Surrogates are spiked into all blanks, calibration and check standards, samples and spiked samples prior to analysis. Percent recoveries are calculated for each surrogate.

Systems Audit - an on-site inspection and assessment of a laboratory's quality control system.

Warning Limits - the limits shown on a control chart within which most of the test results are expected to lie (within a 95% probability) while the analytical system remains in a state of statistical control.

Index

QA Objectives	Operational Elements	Section
Laboratory Qualifications	Documented QA program	All
	Facilities/equipment	12
	Staff qualifications	4
Laboratory Performance	Check Samples	10
	Method blanks	10
	Calibration data	7, 10
	Method detection limits	13
	Method validation	8
	Data quality assessment	13
Matrix Effects	Matrix spike/matrix spike duplicate analyses	10
	Sample surrogate recoveries	10
Data Reporting	Data reduction and validation	9
	Data reporting	9
	Method detection limits	13
Documentation	Written SOPs for field and laboratory procedures	16
	Sampling procedures	5
	Sample custody	6
	Calibration procedures	7
	Analytical procedures	8
	Data validation	9

REFERENCES:

National Environmental Laboratory Accreditation Conference (NELAC). NELAC Standard, Approved June 5, 2003, Effective July 1, 2003, 324 pp (EPA/600/R-04/003).

Environmental Protection Agency (EPA). Guidelines and Specifications for Preparing Quality Assurance Program Plans, QAMS-004/80, EPA, June 1983.

Environmental Protection Agency (EPA). Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans, QAMS-005/80, EPA, December 1980.

ASSOCIATED DOCUMENTS:

Corporate LAB SOPs:
LAB-OP-002-ALL PE Testing
LAB-OP-003-ALL DOC Procedure
LAB-OP-004-ALL EQ Lab Audit *In development*
LAB-OP-006-ALL Preparation of Working Solutions *In development*
MSP-FM-006-ALL CAPA CI Form
MSP-MP-009-ALL Document Control Procedure
QES-PR-025-ALL Chemical Hygiene Plan

RECORDS: The cited records are retained in a manner that supports the requirements of the various local, State, and federal regulatory agencies to which EQ adheres.

Attachment A3.D

Laboratory Personnel Qualifications

JOB DESCRIPTION

TITLE: TECHNICAL MANAGER

RESPONSIBILITIES:

Under the general supervision of the General Manager, the Technical Manager is responsible for the supervision of the daily activities of the laboratory. The Technical Manager is also responsible for the review and approval of new waste streams and the yearly updates of approved waste streams.

1) Daily supervision of laboratory personnel
2) Review and approve waste streams for facility acceptance
3) Review and approval of yearly update of approved waste streams
4) Assist customers with waste characterization and related documentation.
5) Review of analytical data
6) Provide relevant and update Approval Maintenance Reports
6) Analysis of laboratory samples.
7) Act as a liaison between the laboratory, customers and the sales force.
8) Research regulatory compliance issues

QUALIFICATIONS:

1) BS in Chemistry, Biology or related field
2) Two to five years experience in the waste management industry
3) Good knowledge of hazardous waste regulations
4) Excellent communication and problem solving skills
5) Ability to manage multiple projects and perform consistently under time constraints
6) Ability to work in a team environment.

TRAINING:

1) Twenty-four hour HAZWOPER training and annual 8 hour updates
2) Eight hour HAZWOPER-SUPERVISOR training
3) RCRA Initial and annual updates
4) Laboratory Hygiene
5) Hazardous Waste Management Characterization and Approval of waste (EQ 5)

JOB DESCRIPTION

TITLE: LABORATORY CHEMIST

RESPONSIBILITIES:

Under the general supervision of the Technical Manager, responsible for the fingerprint analysis of inbound and outbound shipment samples. Also, responsible for the analysis of samples for waste stream approvals using wet chemistry techniques.

1) Mix and produce GC standards, chemical solutions
2) Run solvent scans on reclaim samples
3) Identify questionable or unknown solvents
4) Conduct PCB analysis
5) Troubleshoot and maintain computer software
6) Maintain appropriate chemical records
7) Maintenance repair and calibration of all laboratory instrumentation
8) Assist in the compilation of monthly reports
9) Order all chemicals, gases and supplies

QUALIFICATIONS:

1) B.S. in Chemistry or equivalent experience and B.S. in related field

TRAINING:

1) Twenty-four hour HAZWOPER training and annual 8 hour updates
2) RCRA Initial and annual updates
3) Laboratory Hygiene

JOB DESCRIPTION

TITLE: LABORATORY TECHNICIAN

RESPONSIBILITIES:

Under the general supervision of the Technical Manager, responsible for the fingerprint analysis of inbound and outbound shipment samples. Also, responsible for the analysis of samples for waste stream approvals using wet chemistry techniques.

1) Record receipt of Pre-qualification samples and WCR's, perform pre-qualification analysis for waste stream approval, prepare laboratory documentation
2) Perform fingerprint analysis on samples from inbound shipments
3) Perform outbound analysis on samples from outbound shipments
3) Calibration of instruments
4) QA/QC analysis
5) Cleaning of laboratory facilities
6) Operate waste distillation unit to supply laboratory
7) Properly dispose of waste generated by the laboratory and samples
8) Wash glassware
9) Monitor supply and chemical stock; initiate order

QUALIFICATIONS:

1) Two or more years of college level chemistry or biology classes
2) Knowledge or laboratory methods and techniques

TRAINING:

1) Twenty-four hour HAZWOPER training and annual 8 hour updates
2) RCRA Initial and annual updates
3) Laboratory Hygiene