Michigan Disposal Waste Treatment Plant and Wayne Disposal Inc.
Analytical Laboratory
Quality Assurance Management Plan

Brian DePorre
Technical Service Manager

Sylwia Scott
Environmental Manager

Kerry Durnen
Vice President and General Manager

TABLE OF CONTENTS

1.0 INTRODUCTION

1.1 PURPOSE

The purpose of this Quality Assurance Management Plan (QAMP) is to provide a description of US Ecology'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.

1.2 REFERENCES

US Ecology 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, Compendium and the NELAC Institute (TNI) Standard -2009 have also been incorporated into the plan.

1.3 SCOPE

The QAMP applies to all US Ecology Michigan laboratory employees, and supervisors of laboratory employees, in instances where regulatory defensible quantitative data is required.

2.0 MANAGEMENT REQUIREMENTS

2.1 ROLES AND RESPONSIBILITIES

Director of Operations (or otherwise named): The Director of Operations is responsible for all management issues with the laboratory.

Director of Laboratories-US Ecology: The Director of Laboratories for US Ecology is responsible for regularly auditing laboratories- both internal and external- to ensure compliance with technical procedures, this QAMP, and other best practices.

Technical Services Manager: The Technical Services Manager, in conjunction with the Laboratory Supervisor, is responsible for the implementation of this program. The Laboratory Supervisor will discuss laboratory needs and requirements, and significant corrective actions or changes to operational procedures with the Technical Services Manager.

Laboratory Supervisor: The Laboratory Supervisor oversees daily operations of the laboratory. In addition to supervision of laboratory employees, the lab supervisor ensures reporting of any required metrics and completion of any required audits.

Laboratory Employees: Laboratory employees are responsible for understanding and following this protocol.

3.0 QUALITY SYSTEMS

3.1 QUALITY ASSURANCE POLICY

The objective of US Ecology's Laboratory Quality Management System is to support the management teams' commitment to consistently provide operations with defensible data of known and documented quality that meets all regulatory requirements. Our policy is to always use good professional practices, to maintain quality, to uphold the highest quality standards, and to comply with the relevant aspects of both ISO/IEC 17025:2005(E) and TNI NELAC Standard EL-V1-2009-ISO. US Ecology ensures that all laboratory personnel are free from all commercial, financial, and other undue pressures, which might adversely affect the quality of data. This policy is implemented and enforced through the unequivocal commitment of management, at all levels, to the Quality Assurance (QA) principles and practices outlined in this manual. However, the primary responsibility for quality rests with each individual within the laboratory organization. Every laboratory employee must ensure that the generation and reporting of quality analytical data is their fundamental priority. Every laboratory employee is required to familiarize themselves with the quality documentation and to implement the policies and procedures in their work. All employees are trained annually on ethical principles and procedures surrounding the data that is generated. It is US Ecology's responsibility to its employees to provide all resources and training necessary to support the implementation of the Quality Assurance plan.

3.2 IMPLEMENTATION OF QUALITY ASSURANCE POLICY

- Disseminating the policy throughout the Laboratory
- 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 US Ecology
- Assigning specific responsibilities and providing assistance to all persons involved in the generation and reporting of analytical data, and
- Establishing a QA program based on clearly defined objectives, well-documented procedures, a comprehensive audit system, and management support

4.0 DOCUMENT CONTROL

4.1 DOCUMENT TYPE

- Standard Operating Procedures (SOP)
- Work Instructions
- Forms
- Communications

4.2 DOCUMENT CONTROL PROCEDURE

Controlled Documents are assigned a unique document control number. The copy available electronically is considered to be the most up to date and complete. Employees must confirm that any printed document has an identical revision date to the electronic version.

4.3 DOCUMENT REVISION

Changes to documents occur periodically to reflect a change in the operational or analytical processes described therein. Entire documents or applicable revisions to documents are trained on at the time the document is controlled. Previous revisions are archived.

5.0 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, this work shall be placed with a laboratory competent of analyzing the parameters of interest. Often a third party accreditation agency such as NELAP, A2L2, ISO, etc., can be used to substantiate the competency of the subcontracted laboratory.

6.0 SERVICES, SUPPLIES, AND STANDARDS

When the laboratory procures outside services and supplies in support of tests, they use only those outside support services and supplies that are of adequate quality to sustain confidence in the laboratory's tests. In addition to quality, other factors such as availability of products, speed of delivery, pricing, availability of certificates of analysis, and overall user experience are considered.

Solvents, glassware, reagents, and other supplies are stored onsite in sufficient quantities. Acid and solvent blanks are analyzed as part of the method in which they are used. This confirms that they are free of interferences and are appropriate for the methods.

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.

To ensure the highest purity possible, all primary reference standards and standard solutions used by US Ecology 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 their initial use to verify their acceptability for use as a calibration or QC standard. 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 so as to maintain traceability to parameter, concentration, solvent, expiration date, and preparation data, including the initials of the preparer and date of preparation.

7.0 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 accordance with operating recordkeeping requirements outlined in 40 CFR 264.73.

8.0 AUDITS

8.1 ANNUAL QUALITY SYSTEM AUDIT

The quality system audit provides an evaluation of the adequacy of the overall measurement system to provide data of known quality, which is sufficient to meet the objectives of the QA program.

The systems audit consists of observations and documentation of all aspects of the data generation and reporting process. In addition to evaluating analytical procedures and techniques, the systems audit will emphasize review of all recordkeeping and data handling systems. Calibration documentation, completeness of forms, data review, sample handling, quality control documentation, completion of previous corrective or preventative actions, and training are some of the specifics that may be included.

8.2 DOCUMENT REVIEW/ METHOD COMPLIANCE

At least biennially the laboratory supervisor, or a qualified designee, will review technical procedures to ensure compliance with the referenced methodologies provided in the Chemical and Physical Waste Analysis Plan (WAP). The supervisor or designee will further audit the procedure by checking through records and documentation to ensure the procedure is being carried out as written.

8.3 PERFORMANCE AUDIT

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.

Blind Performance Evaluation (PE) samples are ordered from a certified PE provider and submitted to each laboratory. Each regulatory parameter is evaluated at least twice per year.

The data generated during the Performance Evaluation is reported to the appropriate certified PE provider. The certified PE provider evaluates the data and submits a Pass/Fail digital report to the Laboratory Supervisor.

The results of the evaluation are subsequently reviewed with the participating areas of the laboratory, the Director of Laboratories-US Ecology, and other management as required. The Corrective Action Process is initiated for failing analytes.

9.0 CORRECTIVE OR PREVENTATIVE ACTION

The QA program provides systematic procedures to implement corrective actions and improve analytical systems. Circumstances that may require a corrective action plan are: deficiencies being detected through a system or performance audit, QC data (i.e., blanks, spikes, LCS) being outside the acceptable limits for precision and accuracy, or external inquiries.

9.1 ACTIONS RESULTING FROM SYSTEM OR PERFORMACE AUDIT

The US Ecology Corrective Preventative Action Program will be followed. Generally, the program requires the following: a root cause analysis, a planned corrective action, a timeline for completion, documentation of completion, and verification.
Actions that can be immediately completed and verified by the auditor are not required to be managed in accordance with the US Ecology Corrective and Preventative Action Program.

9.2 BENCH LEVEL CORRECTIVE ACTIONS

Corrective action procedures are often handled at the bench level by the analyst who reviews the preparation or extraction procedure for possible errors and checks the instrument calibration, spike and calibration mixes, etc. If the problem persists or cannot be identified, the matter is referred to the Laboratory Supervisor.

Corrective Actions taken on the bench level are normally documented on the Inorganic Analysis and Organic Analyses Corrective Action Sheets.

9.3 MANAGEMENT OF CHANGE

A management of change procedure will be initiated for new types of instrumentations and whenever a base method is changed, to verify that we are remaining compliant with our permits. Example: Switching from 6010D (metals by ICP) to 7010 (Graphite furnace atomic absorption spectrophotometry).

10.0 PERSONNEL

Refer to part 111 permit for personnel qualifications

10.1 DEMONSTRATIONS OF CAPABILITY

Prior to conducting analysis and reporting results, each chemist is required to perform an Initial Demonstration of Capability for each method that they will be performing. Additionally, anytime there is a significant change to a procedure or a method, a demonstration will be recorded. An annual continuing Demonstration of Capability is required for each chemist performing a method.

Demonstrations of Capabilities can be performed in a number of ways: results of 4 successive Laboratory Control Samples with precision and accuracy meeting or exceeding the method criteria, successful analysis of a blind PT sample;, or monitoring of QC trends.

10.2 ETHICS POLICY

At US Ecology, we believe in a culture of honesty, trust, and integrity in all business practices. No employee shall knowingly manipulate or falsify data. No employee shall knowingly deviate from the Quality Assurance requirements established for the laboratory. All employees shall make every effort to minimize the generation of waste during sample preparation and analysis, and will properly dispose of all waste following established laboratory practices. US Ecology will make all necessary information available to the employee to perform job responsibilities according to ethical and established practices.

11.0 TEST METHODS

Refer to Table A2.A.2 Pre-Approval/Waste Characterization Analysis Procedures in the Site WAP.

11.1 STANDARD OPERATING PROCEDURES

SOPs are controlled documents (Refer to section 4 above) that are reviewed and audited regularly. Technical procedures describe a specific testing methodology that will result in measurable analytical data. Procedures are updated regularly as they often contain specific information found outside of the test method. Examples may include instrument specific voltages or gas flows not defined by the methods, consumable part numbers, laboratory specific safety procedures, acceptable QC ranges (if more conservative than the test method), and other helpful information that can be of use to the analyst. Nontechnical procedures and work instructions often describe qualitative analytical procedures (such as reactivity testing) or other business functions of the laboratory, such as how to use software.

12.0 EQUIPMENT AND CALIBRATION

12.1 EQUIPMENT OPERATION

The laboratory maintains instrumentation capable of performing analysis within the required QC specifications of the test method. Documentation of instrument usage and maintenance is found in the electronic logbooks.

12.2 MAINTENANCE

A 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 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 CALIBRATION

Calibration of an analytical system involves 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. Detailed calibration procedures are described in standard operating procedures that are maintained at the facility.

12.5 GLASSWARE CLEANING

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 may include a combination of the following: removal of surface residuals immediately after use with water, alcohol, or solvent; hot tap water soak or rinse to loosen and float most particulate material; hot tap water rinse to flush away floated particulate soak with an oxidizing agent/detergent to destroy traces of organic compounds; dilute acid rinse to remove detergent for inorganic glassware; DI water rinse to remove metallic deposits from the tap water; alcohol rinse or oven dry to eliminate any final traces of contaminants if the glassware is for organic analysis; flush the item immediately before use with some of the same solvent that will be used if the glassware is for organic analysis.
Alternative cleaning procedures can be used if analyses of blanks reflect the removal of contamination.

13.0 MEASUREMENT TRACEABILITY

13.1 GENERAL

Traceability shall be assured using documentation, calibration, and analysis of reference standards. Laboratory equipment should be checked regularly for accuracy or should have a certificate of accuracy or traceability. Balances, thermometers, DI water systems, timers, and volumetric dispensers are all included (Exceptions are class A glassware and glass microliter syringes with a certificate of accuracy). Whenever possible, standards or equipment are traceable to a NIST source.

13.2 REFERENCE STANDARDS AND REAGENTS

Refer to section 6.0.

14.0 HANDLING OF SAMPLES

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, items such as appropriateness of containers, cleanliness of containers, any required preservation to minimize loss of target parameters, and adequate sample volume should all be considered.

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

14.1 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. Glass jars with PTFE lined lids are used for organic parameters and polyethylene containers are used for inorganic parameters.

14.2 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. US Ecology follows the holding times specified in SW-846 Compendium.

1. Per method 1311: 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. Per method 9014: Cyanide analyses must be completed within fourteen days of the sampling date.
3. Per Chapter 4: Volatile organic analyses must be completed within fourteen days of the sampling date.
4. Per chapter 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.

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.

14.3 RECEIPT OF SAMPLES

All samples are received by designated sample custodians. At the time of sample receipt, the custodian's general responsibilities may include the following: ensuring proper storage of the samples until analysis is initiated, inspecting and documenting the physical condition of the sample, reviewing the sample label information for completeness and agreement with the Batch Log or Chain-of Custody forms, and/or labeling the sample with tracking number information if needed

14.4 SAMPLE MANAGEMENT

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 are expected to be returned to the Sample Control Refrigerator as soon as possible following sample preparation. A batch ticket and unique identification number 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 US Ecology's laboratory is restricted to prevent any unauthorized contact with samples, extracts, or documentation.

14.5 SAMPLE DISPOSAL

Laboratory samples are disposed in accordance with all pertinent Federal, State, and Local regulations. Routinely, samples are disposed of by transferring them to the plant processing storage areas where the samples are then processed through waste treatment operations.