PERMIT ATTACHMENT F

WASTE ANALYSIS PLAN
Modified from the Permit Application, Volume I, Sections 4.0 through 4.5 and 4.5.2 through 4.9

4.0 WASTE ANALYSIS PLAN

The Triassic Park Hazardous Waste Disposal Facility (the facility) is a commercial facility that receives hazardous waste generated off-site for treatment, storage, and disposal. This waste analysis plan establishes facility requirements for accepting and characterizing hazardous waste generated both off-site and on-site. The waste analysis plan requirements are established in the 1995 New Mexico Hazardous Waste Management Regulations at 20 NMAC 4.1.500 incorporating 40 CFR 264.13, 20 NMAC 4.1.800 incorporating 40 CFR 268.7, and 20 NMAC 4.1.900 incorporating 40 CFR 270.14(b)(3). The most recent revision of this waste analysis plan will be maintained at the facility as part of the facility Operating Record. The facility will continually upgrade the waste analysis plan with regard to the Land Disposal Restrictions (LDR) regulations contained in 40 CFR 268.

Section 4.1 identifies wastes which will be accepted at the facility and wastes which are prohibited. Section 4.2 lists criteria for waste acceptance and management. Sections 4.3 and 4.4 contain pre-acceptance procedures for initial acceptance of hazardous waste received from off-site generators and management procedures for incoming shipments of waste. The various waste analysis protocols that will be required at the facility are contained in Section 4.5. Sampling and analytical methods and protocols for quality assurance/quality control (QA/QC) are discussed in Sections 4.6 and 4.7. Section 4.8 explains the facility's waste tracking system. Section 4.9 summarizes notification, certification, and recordkeeping requirements related to waste analysis.

4.1 PERMITTED AND PROHIBITED WASTE

Section 4.1.1 identifies hazardous waste permitted for acceptance at the facility. Hazardous waste prohibited at the facility is identified in Section 4.1.2.

4.1.1 Permitted Waste

The facility will treat, store, and/or dispose only those hazardous wastes listed in Part A of the facility permit application. Only hazardous waste which meets the Land Disposal Restrictions (LDR) treatment standards identified in 40 CFR 268, Subpart D, or can be treated at the facility to meet these standards, will be accepted. These treatment standards are applicable to both primary contaminants and underlying constituents.

4.1.2 Prohibited Waste

The Facility will not accept the following wastes from off-site generators:

- **dioxin-contaminated wastes. -** Wastes listed in 40 CFR 268.31 as adopted by 20 NMAC 4.1.800;
- **certain PCB-contaminated liquids. -** Ignitable PCB-contaminated liquids or liquids with PCB concentrations greater than or equal to 50 ppm;

- **certain PCB-contaminated soils**. – Soils with PCB concentrations greater than or equal to 500 ppm will not be accepted at the facility, except for those soils (or other wastes) which are PCB bulk product waste or PCB remediation waste (40 CFR 761). The facility may obtain a permit from EPA for management of Toxic Substances Control Act **(TSCA)** wastes in order to accept other wastes containing PCB concentrations greater than 500 ppm. A copy of this permit will be transmitted to the New Mexico Environment Department (NMED) before such waste is accepted;

- **organic liquids/sludges.** - Liquids/sludges with organic concentrations at levels that make them subject to the treatment, storage, and disposal requirements described in 40 CFR 264 Subpart AA or CC; and that have not been treated, prior to receipt at the facility, to applicable LDR treatment standards (40 CFR 264 Subpart AA and CC as adopted by 20 NMAC 4.1.500);

- **explosives.** - Any substance or article, including a device, which is designed to function by explosion (i.e., an extremely rapid release of gas and heat) or which, by chemical reaction within itself, is able to function in a similar manner even if not designed to function by explosion;

- **radioactive/nuclear materials.** - Materials regulated by the NMED or the New Mexico Oil Conservation Division and defined in 20 NMAC 3.1 Subpart 14, or materials regulated under the Atomic Energy Act of 1954, as amended (including source, special nuclear materials and byproduct materials as defined in 10 CFR 20.1003);

- **medical waste. -** Waste including infectious/biologic/pathogenic solid waste generated in the diagnosis, treatment, or immunization of human beings or animals, in research pertaining thereto, or in the production or testing of biologicals. This also includes infectious waste as defined in NMAC 9.1.105.AL.;

- **Packing house and killing plant offal**. – Defined as a special waste by 20 NMAC 9.1.105. BZ;

- **certain hazardous debris.** - Hazardous debris which has not been treated, prior to receipt at the facility, to meet the LDR treatment standards;

- **certain lab packs.** - Lab packs which contain wastes [identified in 40 CFR 268, Appendix IV (adopted by reference in 20 NMAC 4.1.800)] excluded from lab packs under the alternative treatment standards of 40 CFR 268.42(c) (adopted by reference in 20 NMAC 4.1.800);

- **compressed gases.** - Gases stored at pressures higher than atmospheric; and

- **unknown or unidentified waste. -** These wastes cannot be accepted at the Facility except by special provision and direction from the NMED Secretary (e.g., emergency clean-up operations) or until full characterization has been performed.

4.2. CRITERIA FOR WASTE MANAGEMENT AT THE FACILITY

Waste managed at the facility must meet the facility's criteria for acceptance and management. Waste analysis (or, in some cases, acceptable process knowledge (AK)) will be used to ensure determination of:

- complete characterization of the waste;
- compliance with LDR treatment standards, including, where applicable, underlying constituents. If the waste stream does not meet the LDR treatment standards, the waste will be rejected if the facility does not have the appropriate treatment capability to bring it into compliance;
- compliance with the facility's regulatory and operational limits (e.g., the waste is not included in the permitted wastes listed in Part A of this application or the waste does not meet other operational boundaries established by this WAP).

The criteria to be used to evaluate acceptable knowledge (AK) validity, appropriateness, and adequateness will include:

- Relationship of wastes generated to process information;
- Availability of supporting analytical data and results;
- Correlation of waste material with processes/product chemistry;
- Process line variability with respect to waste generation;
- Waste alteration/treatment activities and resulting waste characterization; and
- Any other relevant information to assess acceptability of information.

4.3 PRE-ACCEPTANCE PROCEDURES FOR OFF-SITE WASTE

Before a waste stream is accepted, all off-site generators will be required to provide a complete waste characterization (Section 4.3.1). After evaluating the paperwork supplied by the generator (Section 4.3.2), the facility will send a representative sample of the waste to a laboratory for analysis and will evaluate the analytical results (Section 4.3.3). Finally, the facility will notify the generator that the facility will accept the waste stream (Section 4.3.4).

4.3.1 Waste Characterization Information Provided by the Generator

The activities associated with pre-acceptance of off-site waste streams are shown in Figure 4-1. The generator must provide the following waste characterization information for each waste stream:

- a completed Waste Profile Form signed by an authorized agent of the generator. An example of a Waste Profile Form is contained in Permit Attachment F2. This form may be changed if the facility believes that more information is warranted or if there are changes in regulations governing the facility;

- other documentation that supports the information presented on the Waste Profile Form (e.g., Material Safety Data Sheets);
- a description of the process that generated the waste;
- a completed Land Disposal Restriction Notification;
- all other supporting data required by 40 CFR 268.7;
- all required certifications;
- waste analysis data used to characterize the waste and/or process knowledge documentation; and
- a representative sample of the waste, of adequate volume for analysis.

Insert Figure 4-1, Pre-Acceptance Procedure for First Time Waste

If waste analysis is used to characterize the waste, the generator must supply, at a minimum, the following waste analysis data for each representative sample:

- identification of the sample medium (e.g., aqueous, sludge, soil);
- information about waste stratification
- brief description of the sampling strategy, including
  - a description of the sampling technique (i.e., biased or random);
  - rationale for selection of the number and location of samples;
  - a description of the statistical approach, if any; and
  - the sample type (i.e., grab or composite);
- identification of the analytical methods that were used and the rationale for the selection of these parameters;
- final laboratory reports including case narratives, waste analyses, and quality assurance/quality control analyses; and
- identification of the laboratory which performed the waste analyses.

The facility will evaluate the way each representative sample was obtained in order to determine whether it is truly representative of the waste stream. The facility will evaluate the information provided by the supplier and will use the documents listed below for guidance.

- The Sampling Plan, Section 4.6 of this document
- Standard Practice for Sampling Waste and Soil for Volatile Organics (American Society for Testing and Materials (ASTM) D4547-91)
- Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, Part III (US Environmental Protection Agency Publication SW-846, latest edition)
- RCRA Sampling Procedures Handbook (EPA Region VI)

In certain cases, generators may meet waste analysis requirements by supplying "acceptable knowledge". Acceptable knowledge includes process knowledge and waste analysis (Permit Attachment F4 identifies acceptable knowledge requirements for foreign generators). Process knowledge includes detailed information of a waste obtained from existing published or documented waste analysis data or studies on hazardous wastes generated by processes similar to that which generated the waste, or industry or trade association hazardous waste profile studies, or EPA documents. Examples of waste streams where process knowledge may be adequate for characterization are K-listed wastes (hazardous wastes from specific sources), which are identified by comparing the specific process that generated the waste to those processes listed in 40 CFR 261.32. The application of process knowledge is appropriate where the physical/chemical make-up of the waste is well known and consistent. Process knowledge is often used in conjunction with physical and analytical analysis.

Foreign Generators shall, in addition to all of the above requirements, analysis wastes at an accredited laboratory in accordance with Section 4.7.4, *Laboratory Requirements for Foreign Generators,* and shall characterize all waste streams in accordance with Permit Attachment F4, *Waste Characterization Using Acceptable Knowledge.*

4.3.2 Paperwork Evaluation

The facility will evaluate all of the waste characterization paperwork to determine if it adequately represents the physical and chemical characteristics of the waste stream and whether the waste stream is appropriate for management at the facility. As part of the pre-shipment process, the facility will work with the off-site waste generator to ensure that all necessary waste analyses and waste characterization information are provided to meet the applicable requirements for acceptance.

If waste analysis was used to characterize the waste, the facility will evaluate the data to determine that:

- appropriate extraction and preservation techniques were used;
- appropriate sampling strategies were used;
- appropriate sample types were collected (e.g., to demonstrate compliance with the LDR treatment standards, hazardous waste regulations require that grab samples be collected for nonwastewaters and composite samples be collected for wastewaters);
- appropriate parameters were selected for analysis;
- appropriate analytical methods were used;
- recommended holding times were met;
- detection limits were below applicable standards (e.g., the LDR standards); and
- the quality of the analytical data is adequate for making a waste determination based on an evaluation of the final laboratory reports.

If the data supplied are not adequate to provide a complete characterization of the waste stream, the facility will either require additional information from the generator or will not agree to accept the waste.

All of the waste characterization information supplied by the generator will be maintained in the facility's Operating Record. In addition, the facility's evaluation of this information and the results of the independent analysis will be maintained in the Operating Record.

4.3.3 Representative Sample Assessment

After evaluation and approval of the sample representativeness and waste characterization data paperwork, the representative sample submitted by the generator will be analyzed by a qualified laboratory other than the one used by the generator. Based upon the facility evaluation of the information supplied by the generator, the facility will inform the laboratory of the medium type (e.g., liquid, aqueous, solid) and appropriate parameters for analysis. The rationale for selection will be maintained in the facility Operating Record.

The generator's Waste Profile Form will be compared with the results of the laboratory analysis of the representative sample and with the facility's permit to ensure that the waste is acceptable for storage, treatment, and/or disposal at the facility. Should there be a discrepancy between the analytical results and the generator information, the facility will contact the generator to resolve the discrepancy. The generator will not be authorized to ship the waste until all discrepancies are resolved. If the discrepancies cannot be resolved with the information provided by the generator, the facility will request a new Waste Profile Form

and any additional information that may be required to characterize the waste adequately. In addition, the facility may require the generator to submit additional samples of the waste for analysis. If the generator cannot supply adequate information to provide a complete characterization of the waste stream the facility will not accept the waste. The generator will submit a new Waste Profile Form for each new waste stream and for an existing waste stream if it is modified significantly.

4.3.3.1 Major Discrepancies

Major discrepancies include the following:

- analytical results indicating that the generator applied an incomplete or wrong waste code to the waste stream;
- analytical results indicating that the generator submitted incomplete or wrong information on the LDR Notification Form;
- analytical results including constituents or underlying hazardous characteristics that are not explained by a description of the process; and
- other information indicating that the waste stream is not characterized properly.

In the event of a major discrepancy, the facility will reject the paperwork and require the generator to analyze the waste in accordance with a sampling plan that is consistent with the guidance in EPA document SW-846, *Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods*, Chapter 9. The facility will require the generator to resubmit the waste characterization information listed in Section 4.3.1 and one or more additional representative samples for analysis.

4.3.3.2 Minor Discrepancies

Minor discrepancies include any other waste characterization discrepancy (e.g., discrepancies which do not question hazardous waste code assignments, waste treatment, or the presence of prohibited items). In the event of a minor discrepancy, the facility will work with the generator to resolve the discrepancy. For example, uncertainties regarding whether sorbents are present will be handled as minor discrepancies. The facility will contact the generator if the Waste Profile Form does not indicate whether a sorbent was added to the waste, or it indicates that a sorbent was added but does not specify the name and type of sorbent and whether it is biodegradable.If the generator cannot provide this documentation, the waste must be tested to determine if it contains a biodegradable sorbent. If the waste is determined to contain a biodegradable sorbent, it will be stabilized prior to disposal or rejected.

4.3.3.3 Additional Waste Acceptance Conditions

In addition to complete characterization of the waste, the facility will also evaluate the waste to ensure that it can be managed at the facility. Waste analysis will be conducted where necessary to ensure:

- the waste is not prohibited (e.g., the waste is included in Part A of this application, is not listed in Section 4.1 as a prohibited waste, or does not exceed allowable PCB concentrations or include dioxins);
- the LDR treatment standards contained in 40 CFR 268, Subpart D, including the standards for underlying hazardous constituents, are met;

- the general requirements contained in 40 CFR 264.17 for ignitable, reactive, and/or incompatible waste are met;

- the special requirements for bulk and containerized liquids contained in 40 CFR 264.314 are met; and

- the waste does not contain biodegradable sorbents, as required in 40 CFR 264.314(e).

All major and minor discrepancies, discrepancy resolutions, and compliance with the additional waste acceptance conditions listed above will be documented in writing and maintained in the facility Operating Record.

4.3.4 Notification and Approval of Waste Shipment

After the facility determines that the waste stream meets the pre-acceptance requirements, the facility will send a written notification to the generator. This notification will include:

- a statement that the waste is acceptable for shipment;

- a unique identifier number for the waste stream, assigned by the facility (see Section 4.10);

- instructions to put the unique identifier number on all shipment paperwork and all future waste characterization data that are submitted for the waste stream;

- a requirement to notify the facility at least 24 hours before shipping, so that the facility can ensure that there are sufficient resources and capacity to manage the shipment when it arrives;

- a statement that the facility reserves the right to delay shipments beyond the 24-hour time-frame;

- instructions to ensure safe management of the waste (e.g., packaging or labeling requirements not otherwise required by regulations);

- if the generator has treated the waste prior to shipment to meet applicable LDR treatment standards, a requirement that the generator develop and follow a written waste analysis plan which describes the procedures used; and

- a requirement that the generator retain on-site a copy of all notices, certifications, demonstrations, waste analysis data, and other documentation produced pursuant to characterization of the waste stream for five years from the date that the waste was last sent to the facility.

Once the facility has completed pre-acceptance requirements and has determined that a waste stream is acceptable for shipment, the on-site laboratory will be notified in writing. The notification will include the waste type, waste stream identifier, physical form, packaging, and how the waste is to be managed. This information will be used by the laboratory as follows:

- the waste stream identifier will be used to track the samples in relation to the waste stream;

- the waste type and management methods (storage, solidification, evaporation, and/or disposal) will be used to help determine the analytical methods that will be employed for fingerprint analysis; and

- the physical form and packaging will determine the most applicable sampling methods.

Using this information, the on-site laboratory will designate a sampling and analytical protocol specific to each waste stream as described in Section 4.6. The unique identifier number for the waste stream will be used to track all activities for the waste stream. Individual shipments from within the waste stream will receive an additional identifier to enable the facility to tie information back to the specific shipment as well as to the waste stream.

4.4 PROCEDURES FOR INCOMING WASTE ACCEPTANCE

The activities associated with incoming waste shipments (typically, in drums, roll-off boxes, vacuum trucks, and tanker trucks) are shown in Figure 4-2. These procedures will be used for both initial shipment of a waste stream as well as for waste streams that have previously been accepted by the facility from the same generator and process. The facility will review the waste shipment paperwork and resolve paperwork discrepancies (Section 4.4.1), and visually inspect the waste inside the containers and roll-off boxes (Section 4.4.2). Waste analyses for incoming shipments consist of fingerprint analysis and an annual analysis to update characterization of the waste stream (Section 4.4.3). Based on the facility's evaluation of the waste stream, a determination to accept or reject the waste will be made (Section 4.4.4).

4.4.1 Paperwork Review

Upon receipt of a waste shipment, the truck will be routed to a parking area outside the facility gate while documents are reviewed. The facility will:

- review all paperwork for completeness to verify that all required documentation is present and signed as necessary;

- compare the information in the manifest, the Waste Profile Form, the LDR Notification Form, and pre-acceptance waste characterization information for consistency;

- compare the number of containers, the volume or weight of the waste, and the waste labels on each container with the manifest for consistency; and

- review all paperwork to verify that the unique identifier number for the waste stream is on all the waste shipment paperwork and all accompanying waste characterization data.

If the facility determines that the paperwork is complete and consistent, the waste shipment will be routed to the truck sampling station, a staging area inside the facility gate.

Insert Figure 4-2, Incoming Waste Shipment Procedures

If the facility determines that the paperwork is incomplete or inconsistent, the waste shipment will be routed to a segregated, secure area inside the facility gate pending resolution of the discrepancies. An attempt will be made to resolve discrepancies with the waste generator or transporter within 24 hours. In those instances where a discrepancy with the manifest cannot be resolved within 15 days of receiving the waste, a letter will be submitted to NMED describing the discrepancy and the attempts made to reconcile it. A copy of the manifest or shipping paper at issue also will be provided to NMED, as specified in 40 CFR 264.72(b). If the facility is unable to resolve the manifest discrepancies, the waste will not be accepted.

The facility will resolve significant manifest discrepancies in accordance with 40 CFR 264.72. Manifest discrepancies are differences between the quantity or type of hazardous waste designated on the manifest and the quantity or type of hazardous waste contained in the shipment received at the facility.

Significant discrepancies in quantity are:

- **bulk waste.** - Variations greater than 10 percent in weight; and

- **batch waste.** - Any variation in piece count, such as a discrepancy of one drum in a truckload.

Significant discrepancies in type are obvious differences which can be discovered by inspection or waste analysis, such as waste solvent substituted for waste acid, or toxic constituents not reported on the manifest or shipping paper.

All discrepancy resolutions will be documented in writing and maintained in the facility Operating Record. If manifest discrepancies are not resolved within 90 days of identifying the discrepancy, waste will not be accepted for storage or disposal, and the waste will either be returned to the sender or disposed at an appropriate off-site facility.

4.4.2 Visual Inspection

After all paperwork discrepancies have been resolved, the facility will physically open and inspect the waste inside drums and roll-off boxes for color, similar physical appearance (e.g., single phase, bi-layer, multi-layer), and physical state (e.g., solid, semi-solid, or liquid). This information will be compared with the waste characterization information provided by the generator and the physical appearance of the representative sample. If the color and/or viscosity of bulk wastes (solids and sludges) appear inconsistent, the facility may elect to perform additional chemical tests, i.e., composite samples would be taken from within the different areas of coloration or viscosity.

The facility will inspect a minimum of 10 percent of all drums of each waste stream per shipment (but not less than one drum per waste stream), and each roll-off container or tanker truck.

The facility will physically open all containers of hazardous debris and inspect the contents to ensure that the waste shipment matches the waste that is expected. Prior to acceptance of hazardous debris the facility will require the generator to provide a certification that the waste has been treated in accordance with the requirements defined for the treatment of hazardous debris in 40 CFR 268. Hazardous debris is visually inspected because it is exempted from the representative sample waste analysis requirements discussed in Section 4.7.2. This visual inspection will ensure that the waste stream matches the description provided by the generator.

Certain loads may not be sampled, at the discretion of the facility manager or laboratory supervisor, for environmental and safety reasons (e.g., severe weather which causes unsafe working conditions). In these cases, the generator or his agent will be required to provide a signed certification that the load conforms to

the Waste Profile Form. This variance from established procedure will be documented in the facility Operating Record.

If a discrepancy is found, the facility will contact the waste generator for resolution (see Section 4.4.1). The results of visual inspections and all discrepancy resolutions will be documented in writing and maintained in the facility Operation Record. If discrepancies noted during visual examination are not resolved within 90 days of identifying the discrepancy, waste will not be accepted for storage or disposal, and the waste will either be returned to the sender or disposed off-site at an appropriate facility.

4.4.3 Waste Analysis for Incoming Shipments

Waste analysis for incoming shipments consists of fingerprint tests (Section 4.5.4) and an annual analysis to ensure correct characterization of each waste stream (Section 4.5.3).

4.4.3.1 Fingerprint Test Procedure

Fingerprint testing is an abbreviated analysis and is used to confirm that an incoming shipment of waste received at the facility is the actual waste expected and that it matches the expected chemical content for that waste. Fingerprint analysis will be conducted on each waste stream in each shipment prior to shipment acceptance. Fingerprint analysis will be conducted generally for parameters that will give information that can be used to help verify that a waste stream received from off-site matches the expected characteristics of the waste.

While the incoming shipment is staged at the sampling station, laboratory personnel, or other trained personnel, will review the sampling and laboratory requirements for the specific waste stream. After completion of this review, sampling personnel will obtain the necessary samples in the manner prescribed by the Sampling Plan and applicable laboratory requirements. Sampling will be conducted in accordance with approved site operating procedures. These procedures will detail the sampling requirements, sample labeling, chain-of-custody requirements, any necessary sample preservation requirements, and other sampling components (see Section 4.6).

Each waste stream in each shipment will be sampled in accordance with the following sampling rate, at a minimum:

- **bulk waste.** - One sample will be collected from each shipment of bulk waste (one shipment of bulk waste is considered to be one truck load or one roll-off box). If, upon visual inspection, the color and viscosity of solids or sludges appear inconsistent, the Facility may elect to obtain additional samples. These samples would be composites from within the different areas of color or viscosity; and

- **batch waste.** - One sample will be collected from each ten waste drums in each waste stream in each shipment. If there are less than ten waste drums in the waste stream, one drum will be sampled. One sample will be collected from each drum if the waste appears to be inconsistent with the pre-acceptance waste characterization data.

The facility can increase this sampling rate for any reason. For example, the facility may decide to collect additional samples if the waste appears to be inconsistent with the pre-acceptance characterization data. In some instances, the facility may elect to waive one or more analyses under the following conditions:

- the transported waste is a portion of a continuously shipped, well documented waste stream, such as waste produced from a consistent, non-variable process or contaminated soils from a specific remedial action;

- the waste has been approved for receipt by NMED on an emergency basis; or

- facility personnel at the point of generation sampled, or oversaw the sampling of, the waste, and the fingerprint test/supplemental analyses have been conducted. (In cases where a generator is sending very large or continual shipments, the facility may elect to station personnel at the point of generation to obtain samples prior to or during loading of the waste).

Prior to waiving sampling and analysis requirements, however, the facility will request a variance from NMED and will not dispose of the waste until NMED approval is received.

4.4.3.2 Annual Analysis Procedure

As part of the facility's QA/QC procedures (see Section 4.7), the representative sample analysis for each waste stream from each generator will be repeated annually. Repeating this pre-acceptance procedure will ensure that the analysis is accurate and up-to-date and that the waste stream has remained within the operational bounds of the facility. This annual analysis will be performed by an independent laboratory. This analysis will be repeated more frequently if the facility believes, or has been informed by the generator, that the process generating the waste stream has changed. In the case of a change in the waste generation process the waste stream will be managed as a new waste stream in accordance with the requirements of this waste analysis plan.

4.4.4 Acceptance/Rejection Determination

4.4.4.1 Discrepancy Resolution

Upon completion of the fingerprint analysis, a determination will be made as to whether or not the wastes are consistent with the pre-acceptance waste characterization information and within acceptance limits of the facility and specific management units. If any of the analyses determine the waste is not within the operational acceptance limits for a specific management unit, the waste will not be accepted by the facility for that unit. If the results of the analysis conflict with the waste profile information, the facility may take any or all of the following actions:

- resample the waste, if necessary, and perform a second fingerprint test. The facility manager has discretion to accept the waste if the second fingerprint results match those on the waste profile sheet. The discrepancy between results will be explained and included in the facility Operating Record for that waste stream or shipment;

- perform further characterization as necessary to verify the composition of the waste by sending a sample to a qualified independent analytical laboratory; and/or

- reject the entire waste shipment or the nonconforming portion of the shipment.

If discrepancies between fingerprint analysis and waste stream characterization information exist upon completion of discrepancy resolution, the waste will be rejected by the facility. The facility will return the

rejected waste to the generator or ensure proper disposal of the waste at an appropriate off-site facility within 30 days of the waste rejection.

4.4.4.2 Shipment Acceptance Procedures

Once the decision has been made to accept a waste shipment, the appropriate papers will be signed for the generator, and the waste stream will be transported by truck to an appropriate management unit.

4.5 WASTE ANALYSIS

Tables 4-1 through 4-3 specify parameters which will be analyzed to ensure that all criteria for waste acceptance and management are met. The facility will use approved SW-846 or ASTM analytical methods, or other approved method. If an alternative method not contained in SW-846 is to be used, the facility will demonstrate that such alternative method is equivalent to the approved method contained in SW-846 or this waste analysis plan. Alternative methods will be submitted to the Secretary at least 15 days prior to the sample collection event.

Permit Attachment F1, Section 4.5.1, identifies the rationale for selecting parameters and analytical methods which will be used to test hazardous waste managed at the facility. Requirements for the pre-acceptance analysis of a representative sample of waste generated off-site and for the annual analysis are discussed in Sections 4.5.2 and 4.5.3, respectively. Section 4.5.4 contains requirements for fingerprint testing. Section 4.5.5 contains waste analysis requirements specific to storage, treatment, and disposal units. Section 4.5.6 contains requirements for waste analysis of waste generated on-site.

TABLE 4-1
PARAMETERS AND METHODS FOR PRE-ACCEPTANCE REPRESENTATIVE SAMPLE ANALYSIS

Waste Parameters	Extraction/Sample Preparation	Method1
Volatile Organic Compounds	5021 5031 5032 5035	8260
Semivolatile Organic Compounds	3510 3520	8270
Organochlorine Pesticides	3510 3520	8081/8270
PCBs	3520	8082/8080
TCLP: Organics	1311	8260/8270/8080/8150
Chlorinated Herbicides	81512	8151
Reactive Cyanide		9014
Reactive Sulfide		9034
Water		ASTM C566
Ignitability		1010/1030
Flashpoint		1010/1020A
Corrosivity to metals		1110 pH paper pH electrometer 9040A/9041A/9045A
pH		9040A/9041A9045A
Dioxins		8280
Total Metals	3000 1311	6000 series 7000 series
Liner Compatibility Tests		9090A
Extractable volatiles	3500	8260
Extractable semivolatiles	3500	8270
Physical appearance		ASTM D4979
Radioactivity		Industry standard survey technique (e.g., scintillation detector)

Notes: [1]Most current revision of SW-846 will be used.
[2]Method 8151 contains the extraction, cleanup, and determinative procedures for these analytes.

TABLE 4-2
TESTS AND ANALYTICAL METHODS FOR FINGERPRINT SAMPLES

Test	Method and Description	Qualitative or Quantitative
Flammability Potential Screen	ASTM D4982	Qualitative
Free Liquids	Paint filter test, penetrometer, or visual/9095	Qualitative
Ignitability	Match test, Pansky-Martens closed cup or Set-a-flash 1010/1020A	Qualitative
Miscibility	50/50 mixture with water	Qualitative
Water Mix	ASTM D5058 Test Method C	Qualitative
Chlorinated Solvents	Colorimetric test or Beilsten test	Quantitative
Cyanide	Electrode or colorimetric test (ASTM D5049 Test Method B)	Quantitative
PCBs	Colorimetric test/8080	Quantitative
Specific Gravity	Hydrometer/Method dependent on material composition and physical state	Quantitative
Sulfide screen	ASTM 4978	Quantitative

TABLE 4-3
ADDITIONAL TESTS AND ANALYTICAL METHODS

Test	Reference	Description
Paint Filter Test	EPA 9095	This test will determine the free liquids that are contained within the waste matrix and will be used as a control parameter for wastes that are to be landfilled.
Heavy Metals	6010A/7470	This test determines the concentration of heavy metals.
Free Cyanides	APHA 412G, H	This test determines if cyanides could potentially be reactive under acidic conditions.
Toxicity Characteristic Leaching Procedure[1]	Extraction Method 1311/3010A	Determines if waste, or stabilized waste, contains level of restricted constituents above BDAT treatment standards.
Total Organic Halogens	EPA 9020	Determines if the waste potentially contains LDR constituents above BDAT standards for "California List" wastes.
PCBs	Colorimetric test/ EPA 8080	Determines if PCBs are contained in the waste matrix and determines the concentration.
IR Scan	ASTM D2621, D4053	Determines the presence of organics and provides a rough estimate of their concentration.

[1]Analytical method chosen is dependent upon constituent being determined (i.e., Organics 8260, 8270, 8080).

4.5.2 Representative Sample Analysis

The facility will select parameters for analysis to ensure that the criteria for waste acceptance identified in Section 4.2 are met. The analysis will include, at a minimum, testing for each hazardous waste contained in the waste stream, as identified by EPA hazardous waste code, and for each underlying hazardous constituent, as identified in 40 CFR 268.48, Table 4-1, *Parameters and Methods for Representative Sample Analysis*. Additionally, parameters on Tables 4-2, *Tests and Analytical Methods for Fingerprint Analysis*, and 4-3, *Additional Tests and Analytical Methods*, will be included, as applicable.

For foreign wastes, in addition to the conditions specified above, representative sample analysis for each waste stream shall include testing for all constituents listed in 40 CFR 268.48 using practical quantitation limits capable of measuring the standards specified in 268.48. The results of this test will be used to perform the comparison with the generator's Waste Profile Form specified in the *Representative Sample Assessment* Section (Waste Analysis Plan Condition 4.3.3). Testing for all constituents listed in 40 CFR 268.48 shall not be required for the annual analyses.

Hazardous debris, as defined in 40 CFR 268.2(g), that has already been treated to meet the LDR treatment standards as described in 40 CFR 268.45 does not have to meet the representative sample analysis requirements if the facility determines that the generator provided waste characterization information that demonstrates that the proper EPA Hazardous Waste Numbers were applied and indicates whether or not the LDR treatment standards have been met.

4.5.3 Annual Analysis

The representative sample analysis for each waste stream from each generator will be repeated annually at an independent laboratory not used by the generator (see Section 4.4.3.2).

4.5.4 Fingerprint Analysis

Fingerprint samples will be analyzed for all parameters listed on Table 4-2, and may include tests for physical appearance, pH, and radioactivity. Additional fingerprint parameters will be selected based on the pre-acceptance waste characterization data, shipment paperwork, physical form of the waste, and the visual inspection of the contents of containers and bulk waste. The facility will follow the additional parameter selection process described in Section 2.2 of the EPA guidance document, *Waste Analysis at Facilities That Generate, Treat, Store, and Dispose of Hazardous Wastes* (EPA, OSWER 9938.4-03, April 1994).

Because the facility already knows the detailed chemical and physical properties of a waste, additional necessary and appropriate fingerprint or spot check parameters can be chosen easily, since the purpose of the fingerprint is only to verify that the waste fingerprint analysis will include, at a minimum, the parameters received is the waste expected. These parameters will be analyzed at the on-site laboratory. Analyses which are not within the on-site laboratory's capability will be sent to an independent laboratory for analysis.

Fingerprint analysis will also include parameters as necessary to ensure that the waste is within the facility regulatory and operational acceptance limits (see Table 4-3). To select these additional sample parameters, the facility will consider:

- compliance with applicable regulatory and permit requirements. (This may require selection of parameters not reported by the generator);

- identification of incompatible and inappropriate wastes; and
- process and design considerations.

As noted, fingerprint analysis helps the facility minimize the potential to receive waste that is unacceptable. Therefore, the level of additional analysis required for a waste shipment is a function of facility knowledge about the waste generation process and the waste generator. The facility may elect to perform additional fingerprint tests to achieve a higher level of confidence that a full waste characterization is achieved. If discrepancies are noted between the received waste and the Waste Profile Form, the waste will be further analyzed using additional fingerprint parameters. Discrepancies that can result in the facility requiring additional analysis include non-conformance with the results of required testing or a change in color, texture, liquid content, or other characteristics that can be observed upon receipt.

The facility will follow the additional parameter selection process described in Section 2.2 of the EPA guidance document, *Waste Analysis at Facilities That Generate, Treat, Store, and Dispose of Hazardous Wastes* (EPA, OSWER 9938.4-03, April 1994).

4.5.5 Additional Analysis for Specific Management Units

4.5.5.1 Overview of Waste Management Procedures in Permitted Hazardous Waste Management Units

Upon completion of the fingerprint analysis, and supplemental analyses if conducted, waste will be transferred to the appropriate staging area. Prior to interim or final disposition of the waste, however, additional analyses may be required to ensure that requirements for permitted hazardous waste management units are met.

Analysis necessary for specific management units is generally conducted as part of the pre-acceptance procedure (see Section 4.7.2). Appropriate parameters will be selected from Tables 4-2 and 4-3. The facility will use a combination of process knowledge and analytical results to obtain the information needed prior to placing waste in one of the management units. The facility may elect to use other EPA approved analytical methods if it is felt that information other than that obtainable by these methods is needed to manage the waste safely.

All hazardous waste management units will have specific ignitability, reactivity, and compatibility requirements which must be met. Acceptable knowledge or waste analysis will be used to determine whether a waste stream is ignitable, reactive, or incompatible with other wastes when stored or mingled. In addition, acceptable knowledge or waste analysis will be used to determine whether the waste stream is compatible with the container or tank in which it is placed, or with the liner of the evaporation pond or landfill. Specific ignitability, reactivity, and compatibility tests will be conducted as part of the representative sample analysis, and may be repeated in the fingerprint test, for wastes assigned to specific management units. Management of these wastes is discussed in Vol. I, Section 5.5 of this application. Ignitability, reactivity, and compatibility determination is discussed in Section 4.5.1.2.

The facility will conduct compatibility tests as part of the representative sample analysis procedure on an incoming waste stream specific to each management unit and specific to other waste streams with which it may be combined. Special requirements for specific management units are discussed in Sections 4.5.5.2 through 4.5.5.5.

4.5.5.2 Waste Analysis Requirements Specific to Storage Units.

Wastes will be stored in the drum storage building, the roll-off container storage area, and the liquid waste storage tanks. Waste characterization is accomplished through the representative sample analysis, the yearly update of the representative sample analysis, and on-going fingerprint analysis. The ignitability, reactivity, and incompatibility of each waste stream will be determined using procedures listed in Table 4-2 to ensure that stored waste is compatible with other wastes and with the container or tank in which it is placed. Spills or releases of hazardous waste and/or fluids removed from the leak detection systems will be tested to determine if the recovered material is hazardous.

Procedures from Table 4-3 will be used to determine whether a hazardous waste stored in containers must comply with the requirements of 40 CFR 264, Subpart CC. If it must comply, the container will be managed to meet Container Level 1 and Level 2 standards as appropriate. Waste which must comply with the requirements of 40 CFR 264, Subpart CC, will not be placed in storage tanks.

The facility will ensure that containers are either at least 90 percent full when placed in the landfill, or are crushed, shredded, or similarly reduced in volume to the maximum practical extent.

4.5.5.3 Waste Analysis Requirements Specific to the Evaporation Pond

Liquid waste streams may be placed in the evaporation pond for drying before they are sent to the stabilization tanks for solidification. Following evaporation of the pond liquids, sludge will be removed from the bottom with trash pumps or hand excavation equipment.

Waste will be characterized by representative sample analyses and fingerprint analyses, using the parameters listed on Tables 4-1 through 4-3, as applicable, before it is placed in the evaporation pond. A determination of ignitability, reactivity, and incompatibility with other wastes with which the waste may be combined and with the pond liner will be made. It will also be tested to ensure that the LDR standards are met and that the waste placed in the pond does not contain volatile organic concentrations equal to or greater than 500 ppmw.

Because evaporation in the pond may change the chemical composition of the waste, or different waste streams may be combined in the pond, analysis to ensure that the LDR standards are met will be conducted on a waste stream after it leaves the pond. Applicable knowledge will be used to determine appropriate parameters for analysis. If, after treatment, a waste displays a characteristic for the first time, the characteristic waste code will be added to the LDR Notification Form and facility records. The waste will be retreated, if necessary, to meet the characteristic treatment standard before land disposal.

Dilution of restricted wastes will not be used as a substitute for adequate treatment for non-toxic hazardous characteristic waste. If toxic characteristic wastes and listed wastes are amenable to the same type of treatment and aggregation is a part of treatment, then the aggregation step does not constitute impermissible dilution.

4.5.5.4 Waste Analysis Requirements Specific to the Stabilization Tanks

Waste treated in the stabilization tanks is characterized to determine the hazardous constituents contained in the waste and to ensure that waste placed in the stabilization tank is compatible with the tank liner and with the previous waste type treated. Acidic or caustic material may be neutralized by the stabilization process.

In addition to the representative sample provided by the generator during the pre-acceptance period, a second representative sample of any waste requiring stabilization prior to placement in the landfill (or a sample of waste coming from the evaporation pond for stabilization) must be supplied. This sample will be used for bench-scale testing to determine regulated constituent leaching based on varying admixtures and ratios (i.e., to

determine treatability of wastes). The stabilization process will result in a dry and structurally stable material that is suitable for compaction and landfilling.

Bench-scale tests will be conducted as part of the representative sample analysis for incoming waste streams which will go directly to the stabilization tanks, or for a waste stream from the evaporation pond. Selection of treatment reagents and quantities will be established according to the waste profile and the post-treatment LDR requirements. Stabilization agents that will be tested include, but are not limited to, lime, fly ash, and Portland cement.

The waste will also be treated to ensure that it does not contain volatile organic concentrations equal to or greater than 500 ppmw.

The EPA universal treatment standard (see 40 CFR 268.48) will be met for wastes treated on-site. Waste streams that carry more than one characteristic or listed EPA Hazardous Waste Number will be treated to the most stringent treatment requirements for each hazardous waste constituent, including underlying hazardous constituents. When wastes with different treatment standards are combined solely for the purpose of treatment, the most stringent treatment specified will be met for each hazardous constituent in the combined waste.

After stabilization, wastes will be retested prior to placement in the landfill to determine whether they meet LDR requirements. If LDR requirements are not met, the waste will be retreated. After testing, stabilized waste will be placed in roll-off containers and placed on the roll-off pad until cured.

4.5.5.5 Waste Analysis Requirements Specific to the Landfill.

The stabilized waste will be retested prior to placement in the landfill to determine whether it meets LDR standards as set forth in 40 CFR 268, Subpart D. 40 CFR 268.40 states that a waste identified in the table "Treatment Standards for Hazardous Wastes" may be land disposed only if it meets the requirements found in the table. For each waste, the table identifies one of three types of treatment standard requirements:

- All hazardous constituents in the waste or in the treatment residue must be at or below the values found in the table for that waste ("total waste standards"); or

- The hazardous constituents in the extract of the waste or in the extract of the treatment residue must be at or below the values found in the table ("waste extract standards"; or

- The waste must be treated using the technology specified in the table ("technology standard") which are described in detail in 40 CFR 268.42, Table 4-1.

In cases where treatment standards are based on concentrations in the waste extract, the facility will use toxicity characteristic leaching procedures (TCLP, see 40 CFR 261, Appendix II) to determine if the waste meets the standards. The sampling and analysis protocols outlined in Sections 4.5 through 4. 7 of this permit application will apply to all wastes to ensure compliance with LDR standards. Parameters for analysis will be determined by the characterization of the waste before analysis. All information obtained to document LDR compliance will be maintained in the facility Operating Record.

In addition to other required procedures and analyses, on an annual basis the facility will randomly sample and analyze a minimum of 10 percent of incoming waste streams that are to be directly landfilled to verify conformance with the LDR requirements. These additional samples will be analyzed for the specific regulated hazardous constituents contained in the hazardous waste stream. The data generated from these samples, in conjunction with the generator-supplied data, will be used to verify conformance with the LDR requirements.

Facility personnel, either at the facility or at the point of generation, will collect these samples. The samples will be split into a minimum of two aliquots. One will be retained and the other analyzed for conformance with the applicable LDR requirements. If the results of the analysis indicate that the waste does not conform with the applicable LDR requirements, the retained sample will be analyzed, generator-supplied information re-evaluated, and an evaluation made of the potential for the waste's variability based on the process that generates the waste stream.

The retained sample will subsequently be analyzed, the generator-supplied information re-evaluated, and an evaluation made of the potential for the waste's variability based on the process that generated the waste stream. These factors, along with an evaluation of the QA/QC data from the laboratory (both the generator's and the facility's), will be used to determine if the subject waste stream is eligible for continued disposal at the facility or if additional treatment is necessary prior to disposal. Disposal of the waste stream will be discontinued until the discrepancy regarding compliance with the LDR requirements has been resolved and the generator has demonstrated that its on-going program for compliance with LDR requirements is adequate.

Procedures to meet LDR standards for specific wastes include the following:

- **lab packs.** - Prior to disposal, hazardous wastes contained in lab packs will be treated to meet applicable treatment standards for each waste type identified. Procedures to determine applicable

treatment requirements, and the subsequent treatment of lab wastes to applicable standards, will be consistent with procedures implemented for other waste types. Lab packs will also be analyzed to ensure that they do not contain hazardous wastes listed in 40 CFR 264, Appendix IV. In cases where hazardous lab pack wastes are combined with non-–hazardous lab pack wastes prior to or during treatment, the entire mixture will be treated to meet the most stringent treatment standard for each hazardous constituent before being disposed of in the landfill;

- **ignitable or reactive wastes.** - Ignitable or reactive hazardous waste will be tested to ensure that it will not be placed in the landfill until the waste has been rendered non-ignitable or non-reactive by treatment;

- **characteristic wastes.** - Generator process knowledge and/or analytical data will be used to determine whether characteristic wastes meet the applicable treatment standards or to demonstrate that the waste has been treated by the appropriate specified treatment technology. In accordance with 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;

- **bulk liquids.** All hazardous wastes will be tested for the presence of free liquids (paint filter test) to ensure that no free liquids are placed in the landfill. No containers holding free liquids will be placed in the landfill unless the container is in a lab pack, or the container was designed to hold liquid for use other than storage, such as a battery or capicitor, or the container is very small, such as an ampule;

- **Reactive wastes.** - Reactive wastes will not be placed in the landfill until they have been rendered nonreactive by treatment;

- **Incompatible wastes.** - Incompatible wastes will be sufficiently separated when placed in the landfill to ensure that they do not combine to cause adverse reactions. These wastes will be managed to ensure that they meet the requirements specified in 40 CFR 264.313 and 274.17. This management includes placing incompatible wastes in non-adjacent landfill grids and treatment of potentially noncompatible wastes prior to landfilling;

- **hazardous debris.** - Hazardous debris will not be treated at the facility. Therefore, the facility will only accept hazardous debris that has been treated and certified to meet the LDR treatment standards specified in 40 CFR 268.45(b) or (c) by the generator prior to shipment to the facility; and

- **listed waste.-**Listed waste will not be placed in the landfill until it has been shown to meet the requirements of 40 CFR 268.40.

4.5.6 Waste Analysis Requirements for Waste Generated On-Site

4.5.6.1 Overview of Waste Generated on-Site

The facility is expected to generate some waste on-site through waste treatment, day-to-day facility operations, leachate, or releases of hazardous waste to the environment (see Table 4-4).

Table 4-4
Potential On-Site Waste Generation Areas/Activities

Area	Method of Generation	Waste Form*
Landfill	LEACHATE COLLECTED IN THE LEACHATE COLLECTION SYSTEM	L, SL
Evaporation Pond	Leachate collected in the leachate collection system	L, SL
Evaporation Pond	Sludges generated as a result of the cleaning and repair of the liner system	L, SL
Truck Wash	Decontamination rinse water	L, SL
Stormwater Retention Basin	Contaminated rain water	L, SL
Liquid Waste Storage Area	Decontamination rinse water	L
Stabilization Area	Decontamination rinse water	L, SL
Operations	Personal Protective Equipment (PPE) contaminated during routine and non-routine operations	S
Site Operations	Spill residues primarily from waste handling operations. Sampling activities.	L, SL, S
* L-liquid, SL-sludge, S-solid		

Waste generated on-site will be assumed to be RCRA-regulated until process knowledge and/or sampling and analysis can be used to determine the actual nature of the waste. Sampling and analysis will be accomplished in accordance with the requirements this waste analysis plan.

The facility will select waste analysis parameters to confirm the identity of waste streams generated at the facility. The selection of waste analysis parameters will typically be based on knowledge of the physical and chemical processes that produced the waste stream. If there is doubt as to the specific source, the facility will use the waste tracking system to identify all possible sources and to develop a list of specific parameters for laboratory analysis. Acceptable knowledge and analytical testing as necessary will be used to ensure compliance with LDR requirements and provide waste compatibility and other information to determine appropriate waste management activities.

After analysis, the waste will be returned to the unit from which it came or sent to another appropriate unit. The facility will ensure that all on-site generated waste sent to the landfill meets all LDR treatment standards.

Treated waste is considered newly generated waste because hazardous waste treatment at the facility will result in a change in the physical and/or chemical character or composition of the waste. Treated waste will be recharacterized, using waste analysis or acceptable knowledge as appropriate and it will be tested to ensure that LDR treatment standards are met before disposal in the landfill. Waste analysis requirements are discussed in Section 4.5.5.5.

Day-to-day operations at the facility will produce some waste on-site from day-to-day operations (e.g., paint and paint strippers, laboratory chemicals and equipment, vehicle maintenance). This waste will be characterized using acceptable knowledge, or waste analysis if the source cannot be definitively determined. If it is hazardous waste, it may be sent to the evaporation pond or stabilization tanks for treatment as appropriate, and disposed in the landfill. If it is not hazardous waste, it will be sent off-site for disposal.

A **release** is defined as "any spilling, leaking, pouring, emitting, emptying, discharging, injecting, pumping, escaping, leaching, dumping, or disposing of hazardous waste (including hazardous constituents) into the environment (including the abandonment or discarding of barrels, containers, and other closed receptacles containing hazardous wastes or hazardous constituents)". Management protocols for releases generated on-site are discussed below:

- **spills and leaks.** - Spills and leaks may occur during ordinary facility operations (e.g., release of fluid from a leaking drum to the cell trench and sump in the drum handling unit, a spill at any loading or unloading area, or overtopping at the evaporation pond).

Provisions for the detection, characterization, and management of spills and leaks are discussed in Vol. I, Sections 2.0, 5.4.2 , 6.3.5.2, and 6.3.7 of this application. If spills and/or leaks are identified during inspections, the materials will typically be removed from the system, characterized, and managed appropriately. If necessary, the contaminated area will be sampled to ensure that all contaminated materials are removed.

- **decontamination rinse water.** - Personal protection equipment (PPE), as well as other equipment (e.g., trucks, sampling equipment, industrial absorbents used during spill or leak clean-up, emergency equipment), may become contaminated during the course of site operations such as the handling of wastes, the transfer of waste to another unit, or emergency operations. The water used to rinse this equipment will be analyzed to determine if it is a hazardous waste and if the equipment has been adequately decontaminated. Provisions for the detection, characterization, and management of decontamination rinse water are discussed in Vol. I, Sections 5.2.5 and 5.2.10, and Vol III, Section 9.1.2, of this application. Rinse water will be removed to the truck wash area. Rinse water and residues will be chemically analyzed and handled in an appropriate manner;

- **run-on/run-off.** - Facility stormwater control is provided by a network of surface run-on and run-off diversion channels and collection and detention basins (see Vol III, Drawing 25 of this application). To control the run-off from the facility, several collection channels and culverts will be built to divert discharges from storm events to a stormwater retention basin (see Section 2.7 of the Operations and Maintenance Plan, submitted separately). Procedures for management of run-on/run-off are discussed in Volume I, Sections 2.5.1.6, 2.6.1.4, and 5.4.2. Contaminated water will be characterized, treated in the evaporation pond and/or stabilization bins, and disposed of in the landfill in compliance with appropriate regulations. Sampling will be conducted upstream of the stormwater retention basin to determine the point where hazardous constituents were introduced into the stormwater. Appropriate corrective actions will be implemented to prevent further contamination during future stormwater events.

- **investigation derived wastes.** - IDW may include drill muds, cuttings, and well installation purge waters associated with the investigation of spills and releases; purge waters, soils and other materials from regularly scheduled sampling activities associated with waste management units and the vadose zone monitoring system; and contaminated PPE. All IDW will be assumed to be hazardous waste until site or material specific information becomes available. IDW will be stored near the point of generation in appropriately labeled containers for no greater than 90 days and will be appropriately analyzed to determine whether it is either a characteristic or listed hazardous waste. Analysis of materials associated with the IDW may be used also to characterize the IDW. An example of associated analysis for urge waters from the vadose zone monitoring system would be the final analytical results for the samples collected to satisfy regularly scheduled monitoring requirements.

- **contaminated soil.** - Soil means unconsolidated earthen material consisting of clay, silt, sand or gravel size particles as classified by the US Natural Resource Conservation Service, or a mixture of such materials with liquids, sludges or solids which is inseparable by simple mechanical removal processes and is made primarily of soil by volume based on visual inspection. Contaminated soil is soil impacted by a hazardous constituent release. Soil may become impacted by a release either at the surface or subsurface. If the contaminated soil exists at the surface, the appropriate response is described in the Contingency Plan in the Permit Application. If the contaminated soil exists subsurface, the appropriate response will be developed by NMED as permit conditions. Contaminated soils that are managed as hazardous wastes will be analyzed and managed in

accordance with the alternative LDR treatment standards for contaminated soil contained in 40 CFR 268.49.

- **air emissions.** - Procedures for detection of hazardous gases and volatile organic at the landfill are discussed in Vol. I, Sections 2.5.1.8 and 6.2.2 of this application. Procedures to minimize wind dispersal of dust throughout the facility are identified in Section 5.4.8. This section also discusses pollution control systems in the stabilization unit to minimize the release of particulate to the atmosphere. The facility will apply to NMED for a new source air emissions permit before start-up of operations.

- **Leachate. -** Leachate collected from the storage units or the stabilization building is treated as a spill or release. Leachates, as used here refer to landfill and evaporation pond fluids. The definition of leachate is in 40 CFR 260.10, collected from the Leachate Collection and Removal System, the Leak Detection system, or the Vadose Zone Monitoring System sumps.

Leak detection and removal/vadose zone monitoring for evaporation pond leachate is discussed in Vol. 1, Sections 2.6.1.2 and 2.6.4.3 of this application. Procedures for the removal of evaporation pond leachate are discussed in Section 2.5.4.3. Leachate will be removed by vacuum truck on a regular basis, combined with leachate from the landfill and treated in the stabilization tanks to remove free liquids and to ensure that LDR treatment standards are met.

Leak detection and removal/vadose zone monitoring for landfill leachate is discussed in Vol. 1, Sections 2.5.1.3, 2.5.1.4, and 2.5.1.5. Leachate generated from the landfill will be pumped out of the unit sumps into the temporary leachate storage tank. It will then be tested to assure compliance with LDR requirements defined in 40 CFR 268 for F039 listed wastes.

Leachate will be transferred daily from both the landfill and the surface impoundment sumps and combined in temporary storage tanks for management purposes. The combined leachate will be analyzed monthly for the F039 underlying hazardous constituents to determine whether it meets LDR treatment standards and can undergo evaporation in the surface impoundment prior to stabilization.

Leachate may also be collected from the Vadose Zone Monitoring Wells. These wells will be monitored monthly; if any fluids are present they will be sampled and analyzed for all F039 constituents. Biennially, the wells will be analyzed for all the Ground Waste Monitoring List identified in 40 CFR 264, Appendix IX.

Leachate sampling and analysis will follow the sampling and analytical procedures and recordkeeping requirements contained in the Vadose Zone Monitoring System Work Plan and this section.

4.6 SAMPLING PLAN

The Sampling Plan is based upon the guidance provided in Chapter 9 of SW-846. The overall plan takes into account the regulatory and scientific objectives identified in this waste analysis plan. Based upon these objectives, the sampling strategy ensures that the data collected will minimize the potential for accepting waste that is unsuitable for management at the facility. Modifications to the Sampling Plan to include detailed sampling protocols specific to the site activities will likely be required to reflect the sampling to be performed during operation of the facility.

The sampling program will take into account the different types of waste constituents and the various waste matrices that may be encountered. By taking these variables into account, the facility will identify the protocols by which sample locations will be selected and the methods most appropriate for collecting samples from the different waste streams.

The latest revision of SW-846 methods (ASTM) or other approved methods will be used, and site procedures will be revised as necessary to incorporate new requirements.

General sampling methods and collection techniques are discussed in section 4.6.1. Section 4.6.2 contains specific sampling procedures. Section 4.6.3 and 4.6.4 provide information on sample location and sample type, respectively. Section 4.6.5 discusses sampling quality assurance/quality control (QA/QC) procedures. Sections 4.6.6 and 4.6.7 present requirements regarding sample preservation, volume and holding times and for equipment decontamination, respectively.

4.6.1 Sampling Methods

Sampling methods will follow Appendix I of 40 CFR, Part 261 unless a more appropriate method is identified. Table 4-5, *Sampling Methods*, lists general waste matrices and appropriate sampling methods that will be used at the facility. Matrices that will be sampled include containerized liquid, viscous liquids/sludges, crushed/powdered material, rock/rock-like material, soil, and fly-ash-like material. The methods and equipment used for sampling wastes will vary with the form and consistency of the material to be sampled. Also, these matrices will be sampled using a variety of sampling tools (see Table 4-5), including the Coliwasa (containerized liquid/viscous liquid), dipper (containerized liquid/viscous liquid), thief (containerized liquid/viscous liquid), weighted bottle (containerized liquid), scoop (sludge, powdered material, rock/soil material, fly-ash material), shovel (powdered material, rock/soil material), auger (soil/fly-ash-like material) and tube sampler (fly-ash like material and liquids). The facility will select the appropriate sampling method from Table 4-5 based upon the sample matrices, chemical constituents within the sample, and sampling conditions. If a sampling method not presented on Table 4-5 would be more appropriate for the specific matrices to be sampled given site-specific conditions or if the procedures presented below must be modified, an alternative method will be used. If an alternative method is used, the sampling method will be well documented, justified, placed in the Operating Record, and approved by NMED prior to implementation.

TABLE 4-5
SAMPLING METHODS

Waste Matrix	Sampling Method	Sampling Equipment
Extremely viscous liquid or sludge	ASTM D140-70	Coliwasa, dipper, scoop, thief
Crushed or powdered material	ASTM D346-75	Scoop, shovel, tube sampler
Soil or rock-like material	ASTM D420-69	Scoop, shovel, auger
Soil-like material	ASTM D1452-65	Scoop, shovel, tube sampler
Fly ash-like material	ASTM D2234-76	Tube sampler, trier, auger, scoop, shovel
Containerized liquids	SW-846	Coliwasa, tube sampler, weighted bottle, dipper, thief

Sampling equipment will be compatible with waste, and are generally made of glass, steel, or Teflon. Stainless steel is more suitable for sampling solids and soils, while glass and Teflon are more suitable for liquids.

4.6.1.1 Sampling with a Coliwasa

The Coliwasa is used to collect extremely viscous liquid or sludge samples, as well as containerized liquid samples. The Coliwasa provides a representative sample of layered and homogenous liquid materials, and the sampler consists of glass, plastic, or metal tube with an end closure that can be opened and closed while the tube is submerged in the sample material. The following general process will be used to sample with the Coliwasa:

1. Clean/Decontaminate Coliwasa

2. Adjust sampler's mechanisms to ensure that the stopper provides tight closure. Open sampler.

3. Lower sampler into waste so that liquid level inside and outside the sampler remain the same.

4. When sampler hits the base of the material to be sampled, the sample tube is pushed down to close and sampler and lock the stopper.

5. Withdraw the Coliwasa from the waste and place sample into the appropriate sample container.

Note that only plastic Coliwasas constructed of Teflon should be used to sample organics. Glass coliwasas are not used to sample hydrofluoric acid liquids, and if solids are present at the base of the sampled matrix, an alternative sample device will be used to obtain a representative sample of the solid phase.

4.6.1.2 Sampling with a Dipper

Dippers are used to collect liquid samples and free-flowing slurries. The dipper consists of a glass, plastic, or stainless steel beaker or similar container typically clamped, as necessary, to the end of a pole which serves as a handle. The following process will be used to sample with the dipper:

1. Clean/Decontaminate the dipper

2. Insert dipper into the liquid to be sampled, preferably through the entire sample container, if possible.

3. Remove dipper and place sample into the appropriate sample container.

4.6.1.3 Sampling with a Thief Sampler

A thief sampler may be used to collect viscous liquid/sludge samples or to sample small dry granules. Thiefs typically consist of two slotted concentric tubes of stainless steel; the outer tub has a conical tip allowing the sampler to penetrate the sample material, while the inner tube is rotated to open/close the sampler. The following general process will be used to sample with a Thief sampler:

1. Clean/Decontaminate the sampler

2. Insert closed thief into material to be sampled. Rotate the inner tube to open the thief; collect sample.

3. Withdraw the thief, and remove inner tube, transferring sample to sampler container.

4.6.1.4 Sampling with a Weighted Bottle

The weighted bottle is used to sample liquids and free-flowing slurries that are relatively homogeneous. The sampler consists of a glass or plastic bottle with a sinker, stopper, and line that is used to lower/raise the bottle within the sampler matrix. The following general process will be used to sample with a weighted bottle:

1. Clean/Decontaminate the sampler

2. Assemble weighted bottle sampler
3. Lower the sampler to the desired depth and remove stopper

4. Allow bottle to fill

5. Raise sampler and cap (sampler can serve as the sample container).

Nonflourocarbon plastic bottles should not be used to sample organics. Before sampling, ensure that sample line, sinker, and other equipment are compatible with waste materials (i.e. waste will not corrode sampling equipment).

4.6.1.5 Sampling with a Scoop/Shovel

Scoops/shovels are used to sample rock/soil-like, solid or powdered matrices. The following general process will be used to sample with scoops/shovels:

1. Clean/decontaminate the sampler

2. Obtain a full cross section of the waste material using the scoop or shovel that is large enough to contain the waste collected in one cross sectional sweep.

4.6.1.6 Sampling with an Auger

Augers are used to sample relatively hard packed solid waste material or soils. Augers are spiral drilling blades attached to metal shafts which are "turned" downward through sample material, allowing sample to exit the sample matrix by moving upward along the auger spirals. The following general process will be used to sample with an auger:

1. Clean/Decontaminate the sampler

2. Drill downward, using the auger, into the waste material, capturing waste moving upward along the auger blades in the appropriate sample container.

4.6.1.7 Sampling with a Tube Sampler

Tube samplers are used to collect soil/solid samples, and are generally glass or steel tubing that can be inserted into relatively compact matrix. (Modified tube samplers, however, can be used for liquid sampling.) Following insertion of the tube, and tube is extracted with the sample contained in the inserted tube. The following general process will be used to sample with the tube sampler:

1. Clean/Decontaminate the sampler

2. Lower/insert the tube into the waste to the desired depth.

3. When the desired depth is reached, slowly withdraw the tube, taking care to retain as much sample with the tube as possible.

4. Extract sample into the appropriate sample container.

4.6.2. Sample Collection Procedures

This section discusses the general sampling procedures for each type of sample to be collected at the facility, as presented in Table 4-6. It is recognized that the specific sampling that will take place at the facility may differ from general procedures included herein, and approval by NMED is required before revisions are implemented. Additionally, selection of sample locations (Section 4.6.2.8) and sample types (Section 4.6.2.9) for on-site samples to be collected are addressed.

TABLE 4-6
ON-SITE SAMPLE COLLECTION ACTIVITIES

Sample Type	Matrix	Collection frequency	Comments
Fingerprint Sample	All incoming liquid, sludge and solid; debris waste will not be fingerprinted	One/shipment for bulk shipments 1/10 drums for drummed waste	Table 4-2 defines base fingerprint analysis required
Annual Sample	All incoming liquid, sludge and solid; debris waste will not be fingerprinted	One sample annually for each waste that underwent representative sampling prior to initial shipment	Table 4-1 defines base representative analysis required. Sampling will be performed at the generator site.
Spills/releases	Spilled waste and contaminated material (sludge, liquid, soil)	Each release	For Hazardous Waste determination
Evaporation pond output	Waste sludge and liquid as it is removed from pond	Each waste transferal	To determine LDR status
Stabilization Tank Input	Evaporation pond and offsite sludge and liquid leachate.	Each input	For bench scale testing to determine stabilization
Stabilization Tank Output	All tank output (sludge, liquid and solidified solid)	Each output	To determine LDR status
Landfill input	All incoming sludge and solidified solid waste to landfill except debris	Each input to landfill from Stabilization Tank and Evaporation Pond Random sampling of waste directly landfilled.	To determine LDR status. May use results from Stabilization Tank Output/ Evaporation pond analysis.

On-Site Waste	1 Treated waste 2 Day-to-day (Truck Wash, etc) operations 3 Releases 4 Run-on/run-off 5 Investigation-derived waste 6 soil 7 air 8 Leachate/sludges from Evaporation Pond and Landfill	1,2 When acceptable knowledge is not available 3,4 See Vol II Appendices 5 Each container 6 Contingency Plan 7 See Vol IIAppendices 8 Placed in temporary leachate storing tanks; sampled monthly	To determine hazardous/LDR status See Table 4-5 for specific waste matrices generated by On-Site Activities

4.6.2.1 Fingerprint Sampling

Fingerprint sampling will be conducted for all in-coming waste, except for debris waste (each container of debris waste will be visually inspected, however, as will each drum and roll-off, regardless of waste matrix). Matrices that will undergo fingerprint sampling include sludges, solids, and liquids, arriving in containers such as tanker trucks, roll-offs, and drums/containers. Refer to Table 4-6 and Section 4.4.3.1 for sampling frequency and waste analysis.

Tanker trucks delivering bulk liquids will be sampled through an access hatch, with a vertical sample collected using a Coliwasa or other appropriate sampling devise (see Section 4.6.1). Trucks delivering bulk solid material (e.g. in roll-offs) will be sampled using solid sampling equipment, such as a scoop (see Section 4.6.1). A surface sample will be collected from the front 1/3 area of the truck, middle 1/3 are, and rear 1/3 area of the bulk; samples will then be composited (see Section 4.6.4). Vertical waste composition will be determined, as possible, by collecting an additional sample from more than approximately 2 feet below the surface of the waste at each of the three sample locations using the appropriate sample collection tool (e.g. auger); these three samples will be composited with the first three samples. All loads will be visually inspected during unloading. If the load exhibits different color, texture, or wetness, samples from these areas will also be collected and included in the composite sample.

Sample methodology for drummed waste will depend on the sample matrix, but will likely include liquid sample collection using a Coliwasa and solid sampling using a scoop or auger. A single sample, collected through as much depth of the drummed waste as possible, will be collected. The location of samples collected is discussed in Section 4.6.3.

The facility will detail the sampling method used for fingerprint waste sample collection, including but not limited to sample collection technique, sample type, sample representativeness, sample volume, sample containers, sample preservation, chain-of-custody, etc., and will place this information in the Operating Record.

4.6.2.2 Annual Sampling

Wastes that underwent representative sampling prior to initial waste shipment will undergo annual sampling to confirm waste composition. The facility will assess the representative sampling procedure prior to initial waste acceptance, and this same representive sampling procedure will be used for annual sampling. Annual sampling will follow the representative sampling process performed prior to initial waste shipment; if the process is modified, the facility will assess the sampling process to ensure collection of a representative sample, and place this assessment in the Operating Record.

4.6.2.3 Spills/Releases

See Section 4.6.2.7

4.6.2.4 Evaporation Pond Output

Evaporation Pond output will consist of liquids and sludges/solids of varying viscosity/degree of solidification. This waste is then transferred, as appropriate, to stabilization tanks, and/or the landfill. Each waste transfer will be sampled with a single grab sample selected from the waste transferred at the midpoint/middle of sample transfer, if the waste is homogenous. Alternatively, if the waste is heterogeneous, a composite sample may be collected in the transfer vessel using a tube sampler or other appropriate sample devise, with the extracted sample then composited. If modification to these sampling methods to meet waste/site-specific requirements occurs, all information pertaining to the modified method will be detailed in the Operating Record. Samples will be analyzed to assess continued waste LDR compliance. The facility will detail the sampling method used for each output waste, including but not limited to sample collection technique, sample type, sample representativeness, sample volume, sample containers, sample preservation, chain of custody, etc., and will place this information in the Operating Record. Note that leachate and waste sludge may be generated within/below the Evaporation Pond, however, these are considered "on-site" generated waste and are discussed in Section 4.6.2.7.

4.6.2.5 Stabilization Tank Input/Output

Stabilization Tank input wastes include liquid (e.g. leachate) and sludges. Output includes sludges, liquid, and solidified sludge. Input samples are to be sampled primarily for bench-scale testing to assess solidification techniques. Sampling methodology will be dependent upon the matrix sampled, but must include at least one grab sample from the input waste container/stream of sufficient volume to perform bench-scale assessments (assuming a homogenous waste stream). A composite sample will be collected if the stream is heterogeneous in nature. Output waste must be sampled to ensure continued compliance with LDR requirements; see Section 4.6.2.4 for output sampling methodologies. The facility will detail the sampling method used for each input/output waste, including but not limited to sample collection technique, sample type, sample representativeness, sample volume, sample containers, sample preservation, chain of custody, etc., and will place this information in the Operating Record.

4.6.2.6 Landfill Input

All incoming waste to the landfill will be sampled to ensure continued compliance with LDR requirements. For waste originating from the stabilization tank or evaporation pond, output sampling will fulfill this requirement. For wastes directly placed in the Landfill from offsite sources, and on an annual basis, the facility will randomly sample and analyze a minimum of 10 percent of incoming waste streams that are to be directly landfilled to verify conformance with the LDR requirements. These additional samples will be analyzed for the specific regulated hazardous constituents contained in the hazardous waste stream. The data generated from these samples, in conjunction with the generator-supplied data, will be used to verify conformance with the LDR requirements. Sampling procedures will follow those presented in Sections 4.6.2.1 and 4.6.2.4, as applicable.

4.6.2.7 On-Site Generated Waste

Several wastes may be generated on-site that require sampling and analysis (see Table 4-4). Specifically, treated waste, day-to-day generated waste (e.g. truck wash, liquid waste storage area, and stabilization area decontamination rinse, personal protective equipment), releases of wastes, run-on/run-off, investigation-derived waste, contaminated soil, air emissions, and leachate/sludges from the evaporation pond/landfill are considered on-site generated waste.

Leachate/sludges from the evaporation pond and landfill will be placed in temporary storage tanks and/or the stabilization tank. Sampling of leachate/sludges must occur prior to emplacement in the stabilization tanks and/or evaporation pond, and will entail either sampling required of input to these units, or collection of a representative sample from the temporary holding tank using the appropriate sampling devise (e.g. Coliwasa, weighted sampling bottle). Also see Sections 4.6.2.5 and 4.6.2.6.

4.6.3 Selection of Sample Locations

The facility will collect samples from containers and roll-off boxes using either random (i.e., probability) or biased (i.e., authoritative) sampling methods. Random sampling methods will be used to select drummed containers for fingerprint analysis. All other on-site sampling, except for annual sampling of waste directly landfilled (i.e.10 percent of the waste) requires sampling of each load, bulk container, or waste transfer, and random selection of waste containers to be sampled is therefore not applicable. However, the facility will collect random samples from within the waste to be sampled for non-fingerprint or annual analysis (e.g. leachate, landfill input) if the wastes are expected to be fairly homogeneous waste streams. A biased sampling method will be used to select roll-off/tanker waste sample locations. (Biased samples will be collected if the wastes are expected to be or are found to be heterogeneous.) For some waste streams, the facility may use both sampling techniques, as determined appropriate by the facility and justified in the Operating Record.

With random sampling, every unit in a population (e.g., every drum from a given waste stream in a shipment) has a theoretically equal chance of being selected for sampling. Consequently, data generated by these samples are unbiased estimators of the range of concentrations in a population. If a sufficient number of samples are taken, they would be representative of the average concentrations within the entire population. For example, in the case of drums, those drums to be fingerprint sampled will be numbered, and numbers will be randomly drawn to determine those containers that will be sampled.

With biased sampling, a preference is given to selecting only certain units in a population. This technique requires the sampler to use discretion and to have knowledge of the waste. The sampler selects the sample locations from areas where contamination is known or suspected (e.g., the sampler could collect a biased sample from areas where there is layering or differences in color or consistency). Also, the facility may use a field screening instrument to bias the sample location, (e.g., a photoionization detector could be used to select locations having higher volatile organic concentrations). EPA-approved ASTM method D140-70 identifies the procedure for estimating the number of containers that should be sampled. Samples collected from roll-offs, for example, may include biased sampling if areas of obvious discoloration, and other pertinent information, are noted.

The facility will document the sampling technique that is used to locate each waste sample collected pursuant to this waste analysis plan. The facility will maintain this information in the facility Operating Record.

4.6.4 Sample Types

Samples of the waste will be collected as either composite or grab samples. It is possible that the facility may modify or augment the procedures discussed below for the collection of composite and grab samples before the facility becomes operational; if so, these revisions will be approved by NMED prior to implementation.

In composite sampling, a number of samples are initially collected from a waste and combined into a single sample which is then analyzed for the constituents of concern. Composite sampling is a valid method for homogeneous samples and tends to minimize the between-sample variation, much like the maximization of the physical size of a sample. This has the effect of reducing the number of samples that must be analyzed to verify the contents of a waste shipment. Composite samples can also be obtained from a waste that has stratified; however, a composite would only be made from samples obtained from the same strata within the waste. Composite samples will be taken with clean sampling equipment and samples will be blended before analysis. Composite sampling will be used to obtain samples of wastewaters. Grab sampling will be used to obtain samples of nonwastewaters and heterogeneous wastes.

4.6.5 Sampling QA/QC

QA sampling procedures will be conducted in accordance with the guidance provided in the EPA document SW-846 and EPA's waste analysis plan guidance manual, *Waste Analysis at Facilities that Generate, Treat, Store and Dispose of Hazardous Waste*. The QA requirements will be applicable to on-site sampling (e.g., leachate collection system samples, truck rinsate, waste removed from the evaporation pond) as well as to the sampling of incoming waste shipments. This program is necessary to ensure that decisions regarding the acceptance and disposition of waste are based on sound, statistically valid, and documented data. Additional QA procedures associated with sampling and analysis determined prior to initiation of on-site sampling will be included in the Operating Record.

The sampling QA program will include the following:

- training requirements for personnel responsible for sample collection;
- chain-of-custody protocols for tracking samples;
- QA review of procedures to ensure proper use of equipment;
- protocols for equipment maintenance;
- identification of required sampling techniques for specific media;
- field sampling QC procedures; and
- documentation of sampling locations.

Deviations from the approved sampling program, sampling methods, or chemical analytical methods will be documented and reviewed by personnel responsible for site QA. NMED will be notified in writing of the QA exceptions within seven days of the occurrence and measures will be taken to correct the problems as soon as practicable.

4.6.5.1 Training Requirements for Personnel Responsible for Sample Collection

All personnel and supervisory staff responsible for collecting waste samples for screening and chemical analysis will be trained in the use of all sampling methods and equipment used at the site.

4.6.5.2 Chain-of-Custody Protocols for Tracking Samples

The integrity of the sampling/analytical scheme will be maintained by following chain-of-custody procedures from the point of sample collection through analytical data reporting to sample disposal. The possession and handling of samples will be traceable from the time of collection through analysis and final disposition.

A sample is considered to be in a person's custody if it is:

- in a person's physical possession;
- in view of the person after taking possession; or
- secured in a container sealed by the responsible person so that it cannot be tampered with during transport to the designated destination or during storage after being secured by that person in an area of restricted access.

The sampler will place a sample label on each sample container. The label will include the following information:

- sample number, a unique identifier that is traceable to the waste stream and shipment;
- name of collector (sampler);
- date and time of collection; and
- place of collection.

Labels will be affixed to sample containers prior to or at the time of sampling and will be filled out at the time of collection.

Sample chain-of-custody seals will be required if the sample is designated to leave the possession of facility personnel for transport to an analytical laboratory. The seal will include the same information as the sample label. The seal will be attached in such a way that it is necessary to break it in order to open the sample container. In addition, chain-of-custody seals will be affixed to sample storage containers in a similar manner in order to prevent tampering prior to shipment from the facility to off-site analytical laboratories. Samples and storage containers which require seals must be sealed prior to leaving the possession of facility personnel.

To establish the documentation necessary to trace sample possession from the time of collection, a chain-of-custody record will be filled out and will accompany every sample. A sample chain-of-custody record is provided in Vol. II of this application.

If the sample is to be shipped off-site for analysis, it will be accompanied by a sample analysis request sheet. The sample analysis request sheet will include the information necessary to identify the sample and the analyses requested by the facility. Samples shipped off-site for analysis will be packaged and shipped in accordance with DOT transportation requirements.

Laboratory samples will be maintained in a secure area and retained until holding times expire, as listed in SW-846, or three months, whichever comes earlier. After the holding time or three month holding period has expired, samples will be disposed at the facility with compatible waste batches. Records of the date the samples are removed from storage and the date and method of disposal will be maintained at the facility until completion of post-closure care. In cases where samples are not analyzed within their holding times, the facility will resample.

4.6.5.3 QA Review of Procedures to Ensure Proper Use of Equipment

Standard operating procedures will be developed for the use, decontamination, and storage of sampling equipment used to characterize waste shipped to the facility. The standard operating procedures will include the sampling equipment to be used, instructions for use, and the applications for use of the equipment for

collection of samples from specific media and types of shipping containers. The procedures and QA standards for waste sample collection will be included in the standard operating procedures.

4.6.5.4 Protocols for Equipment Maintenance

The protocols for equipment maintenance will be included in the standard operating procedures. Protocols will be developed, as described in the preceding paragraph, for use, decontamination, and storage of equipment. Protocols for equipment maintenance will be included in the standard operating procedures. (See Section 4.6.7 for general decontamination requirements).

4.6.5.5 Identification of Required Sampling Techniques For Specific Media

The sampling methods and equipment used for collecting samples from specific media will be selected in accordance with the guidelines included in 40 CFR, Part 261, Appendix I, and in the EPA guidance manual, *Waste Analysis at Facilities That Generate, Treat, Store, and Dispose of Hazardous Waste*, Chapter 2. Alternative sampling methods may be used with prior approval of NMED.

4.6.5.6 Field Sampling QC Procedures

Blank and duplicate samples will be obtained during waste characterization sampling to confirm that sample collection and handling procedures meet the QA/QC standards outlined in the standard operating procedures and data quality objectives included in the facility sampling manual. Duplicate samples will be collected at a minimum frequency of 10 percent (one for every 10 samples). Field blanks and equipment blanks will be collected at a minimum frequency of 5 percent (one for every 20 samples). Trip blanks will be included with all sample kits where samples are sent to off-site laboratories for chemical analysis. The field QA samples are described below:

- **field blanks.** - Field blanks are prepared in the field by filling a clean container with pure de-ionized water and appropriate preservative (if required for a specific activity). Contaminants found may indicate airborne contamination, contaminated equipment, or cross-contamination during sampling. A minimum of one field blank will be collected for every 20 waste samples collected;

- **trip blanks.** - Trip blanks are sample containers that are prepared with an inert material such as de-ionized water and carried into and out of the field, but not opened at any time during the sampling event. Contaminants detected in the trip blank may indicate that the source where the sample was prepared or the container that transported the trip blank was contaminated. A trip blank will accompany all sample shipping containers sent from and to off-site laboratories;

- **equipment blanks.** - Equipment blanks are prepared in the field prior to sampling by running de-ionized water over sampling equipment and placing it into a clean sample container. Contamination in this type of sample will indicate that the sampling equipment is contaminated. A minimum of one equipment blank will be collected for every 20 waste samples collected; and

- **field duplicates.** - Field duplicates are independent samples that are taken from the same location at the same time and are used to measure the effectiveness of obtaining representative samples. A minimum of one field duplicate will be collected for every 10 waste samples collected.

4.6.5.7 Documentation of Sampling Activities

Sampling activities, including observations and field procedures, will be recorded on appropriate forms and kept on file at the facility. Copies of the completed forms will be maintained in a bound and sequentially numbered file. The record of waste stream sampling activities will include:

- the date;
- the time of arrival and departure;
- weather conditions (including estimated temperature and wind direction);
- the name of the sample collector;
- daily activities and times sampling was conducted;
- observations;
- a record of samples collected, with sample designations and locations specified;
- field monitoring data, including health and safety monitoring;
- a list of equipment used and calibration records, if appropriate;
- a list of additional data sheets completed; and
- the signature of personnel completing the field record.

Each sample collected during waste stream sampling activities will be identified by a unique sample designation. The sample designation will be included on the sample label. QA samples will be designated with a "Q" (QA/QC samples) at the end of the sample designation, followed by one of the following to indicate the type of QA sample:

- **D.** - "D" will be used for a duplicate sample;
- **E.** - "E" will be used for equipment rinsate blanks;
- **F.** - "F" will be used for field blank samples; or
- **TB.** - "TB" will be used for field trip blanks.

This coding will be used to assure that duplicates and blanks are submitted "blind" to the laboratory, but can still be easily tracked by the facility for QA purposes.

4.6.6 Sample Preservation, Volumes, and Holding

Table 4-7 presents general preservation, container, and holding time information for samples collected. SW-846 guidelines have been used to determine these general requirements, although these may be modified or augmented to account for waste-specific requirements, waste-container compatibility considerations, or additional waste parameters for analysis. Specific sample volumes and containers appropriate for the sampling event will be determined by the facility. Prior to any sampling event, sample container labels will be prepared and affixed to sample containers, and all sample containers will be certified clean by the supplying laboratory. Sample labels will identify, at a minimum, sample number, date, sampler, matrix, analyses to be performed, and sample preservation. Once collected, samples will be placed immediately into the shipping container (i.e. cooler), and chain-of-custody documentation will be filled out (see section 4.6.5.2).

TABLE 4-7
GENERAL CONTAINER, HOLDING TIME, AND PRESERVATIVE REQUIREMENTS BY SAMPLE MATRIX

INORGANICS						
Sample Matrix	Concentration	Fraction	Volume	Container Type	Preservative	Holding Times
Water	Low	Total metals	1 liter	C, H, or L	Cool to 4C	6 mos

TABLE 4-7
GENERAL CONTAINER, HOLDING TIME, AND PRESERVATIVE REQUIREMENTS BY SAMPLE MATRIX

		Dissolved Metals	1 liter	C or L	Filter on-site; HNO3 to pH< 2	6 mos
	Medium	Total metals	1 liter	C or L	Cool to 4C	6 mos
		Dissolved Metals	1 liter	C or L	Filter on-site; HNO3 to pH< 2	6 mos
Soil, Sediment, and Residue	Low/Medium Medium	Total Metals	6 0z	F or G	Cool to 4C	6mos

ORGANICS

Sample Matrix	Concentration	Fraction	Volume	Container Type	Preservative	Holding Times
Water	Low	VOCs	80 mili liter	B	HCL to pH < 2, Cool to 4C	14 if preserved
		SVOCs	2 liters	A,K, or H	HCL to pH < 2, Cool to 4C	7 days for extraction; 40 days after extraction to analysis
		Petroleum Hydrocarbons	2 liters	A, K, or H	HCL to pH < 2, Cool to 4C	7 days for extraction, 40 days after extraction to analysis
Soil, Sediment, and Residue	Low/Medium	VOCs	240 ml	D	Cool to 4C	14 days
		SVOCS	3 Oz	F or G	Cool to 4C	14 days for extraction, 40 days after extraction to analysis
		Petroleum Hydrocarbons	3 0z	F or G	Cool to 4C	15 days for extraction, 40 days after extraction to analysis

A= 80 oz amber glass bottle with teflon-lined black phenolic cap
B= 40-ml glass vial with teflon backed silicon septum cap
C= 1-L high density polyethylene bottle with poly-lined, poly cap
D= 120-ml glass vial with teflon lined, white poly cap
E= 16-oz wide-mouthed glass jar with teflon-lined, black ply cap Water
F = 8 0z wide mouthed glass jar with teflon-lined black poly cap Water
G= 4 oz wide-mouth glass jar with teflon-lined, black poly cap Water
H= 1-Liter amber glass bottle with teflon lined, black poly cap
K = 4-L amber glass bottle with teflon-lined, bladk phenolic cap
L = 500 ml high-density polyethylene bottle with poly-fined, baked ply cap

The above table is general in nature and may be modified or augmented, so long as the requirements are congruent with SW-846 requirements.

4.6.7 Equipment Decontamination

Sampling equipment will be decontaminated prior to use. Decontamination of sampling equipment typically includes initial scrubbing with a biodegradeable commercial detergent, followed by a de-ionized water rinse. The decontamination process will include wiping down of sampling equipment to remove surface residue, followed by detergent wash, rinse, a second detergent wash, and second rinse. Modifications to this process may be required to account for site/contaminant conditions, and may take place so long as the decontamination procedure is well documented and appropriate supporting information is placed in the Operating Record.

4.7 ANALYTICAL METHODS

Analytical methods which the facility will use for specific tests are identified in the waste analysis tables (Tables 4-1 through 4-3). All analytical methods used in conjunction with this waste analysis plan must be EPA-approved methods or methods required by hazardous waste regulations. If there is no equivalent EPA-approved method, an ASTM method or other approved method may be used. If the facility or a generator wishes to use alternate test methods, the facility or generator will first demonstrate to the NMED Secretary that the proposed method is equal or superior to the corresponding methods prescribed in 40 CFR 261 or 264, in accordance with 40 CFR 260.21.

An example of a non-EPA method required by hazardous waste regulations are the ASTM tests specified in 40 CFR 264.314(e)(2) to determine the presence of nonbiodegradable sorbents.

Section 4.7.1 identifies the duties of the laboratory manager. Section 4.7.2 identifies the contents of the laboratory QA/QC plan. Requirements for off-site laboratories used by the facility are contained in Section 4.7.3.

4.7.1 Duties of the Laboratory Manager

The on-site laboratory manager will have the following responsibilities to ensure an effective quality assurance program:

- ensuring that laboratory personnel are adequately trained to perform sampling and analytical procedures and in safety procedures;
- ensuring that equipment and instrumentation under his or her control are calibrated and functioning properly;
- coordinating internal and external assurance audits;
- reviewing procedures and QA plans of outside laboratories used. QA/QC practices will be considered during the selection of independent analytical laboratories. QA/QC practices that will be reviewed include written procedures, certification, internal and external audits, personnel training, and chain-of-custody procedures; and
- development, updating, and implementation of the laboratory QA plan.

4.7.2 Facility Laboratory QA/QC Plan

Prior to beginning operations, the facility will develop procedures which will comprise the laboratory QA/QC plan. The facility will develop a QA manual for operation of the on-site laboratory. The manual will be submitted to NMED for review.

The results of chemical analysis of waste samples generated by the on-site laboratory will not be used as part of the waste acceptance evaluation process prior to NMED's review of the QA manual.

The overall QA objective for measurement data is to ensure that data of known and acceptable quality are provided. All measurements will be made to yield accurate and precise results representative of the media and conditions measured. QA objectives for precision, accuracy, and completeness will be established for each measurement variable, where possible, and will be included in the QA manuals of the on-site and off-site laboratories where waste samples will be submitted for chemical analysis. The laboratory procedures, practices, and qualifications will be included in the QA manual for each laboratory.

The laboratory QA/QC plan will be based on guidance provided in EPA's *Requirements for Quality Assurance Project Plans for Environmental Data Operations* (EPA QA/R-5). As such, the plan will address the following key elements in compliance with EPA QA/R-5: project organization; laboratory quality assurance organization; data quality objectives and criteria; employee training and certification requirements; laboratory analytical methods; quality control requirements; laboratory equipment and instrumentation calibration, testing, inspection, and maintenance; QA/QC of suppliers and vendors; data acquisition requirements; data management; data review, validation and verification; and, reconciliation with quality objectives and criteria. These elements and other procedures which will be included in this plan are discussed in the following sections:

- laboratory quality assurance;
- equipment calibration;
- laboratory QA/QC samples;
- laboratory QC;
- analytical procedures; and
- laboratory maintenance.

4.7.2.1 Laboratory Quality Assurance

The facility laboratory and each off-site laboratory will maintain an internal quality assurance program, as documented in its laboratory quality assurance manual. The laboratories will use a combination of blanks, surrogates, duplicates, MS/MSD (matrix spike/matrix spike duplicate) and laboratory control samples, BS/BSD (blank spike/blank spike duplicate), to demonstrate analytical QA/QC. Control limits will be established for individual chemicals or groups of chemicals based on the long-term performance of the test methods. The specific procedures to be completed and the laboratory control limits will be included in the QA manual for each laboratory.

4.7.2.2 Equipment Calibration

The laboratory equipment calibration procedures, calibration frequency, and calibration standards will be in accordance with EPA (or equivalent method) specified test methodology requirements and will be documented in the laboratory's QA manual. All instruments and equipment used by the laboratory will be operated, calibrated, and maintained according to manufacturers' guidelines and recommendations. Operation, calibration, and maintenance will be performed by personnel who have been properly trained in these procedures. A routine schedule and record of instrument calibration and maintenance will be kept on file at the laboratory.

4.7.2.3 Laboratory QA/QC samples

Analytical procedures will be evaluated by analyzing reagent or method blanks, surrogates, MS/MSDs, BS/BSDs, and/or laboratory duplicates, as required or appropriate for each method. The laboratory QA/QC samples and frequency of analysis to be completed will be in accordance with EPA or equivalent method protocols and will be included in the QA manual for each laboratory.

The laboratory QA manuals and procedures will incorporate data quality objectives (DQOs) to verify that waste characterization data obtained by the methods established in this waste analysis plan meet regulatory requirements with regard to regulatory compliance and facility waste management requirements. The following DQOs are established for the sampling and analysis of waste managed by this facility;

- Identify and quantify the hazardous constituents in the waste to ensure compliance with 40 CFR 264 and the requirements of the facility permit, and

- Compare the contaminant concentrations in the waste with the specified characteristics of 40 CFR 261 in order that the waste may be managed in accordance with facility requirements.

To ensure that the laboratory data quality objectives are met, the following analyses will be completed in the laboratory to monitor the analytical process:

- **laboratory duplicate samples.** - Laboratory duplicate samples will be analyzed to monitor for intralaboratory precision of data generated. These samples will be analyzed at a rate of no less than five percent (one for every 20 samples) of the total samples with at least one replicate if fewer than 20 samples are analyzed for any particular parameter;

- **spiked samples (MS/BS).** - Spiked samples will be analyzed to monitor analytical precision. Spiked samples will be tested on no less than a five percent (one for every 20 samples) basis for any particular parameter. At least one spiked sample will be run if fewer than 20 samples are analyzed;

- **control charts.** - Control charts will be utilized to establish laboratory control limits to monitor and review the accuracy of the data generated as a result of spike analyses. Control limits reflect long-term data accuracy trends and will be modified as new data are acquired;

- **method/reagent blanks.** - Method/reagent blanks will be prepared using samples of purified water or reagents which will then subjected to the entire sample analytical procedure to monitor potential contamination of samples due to contamination in the laboratory or laboratory equipment. Method or reagent blanks will be included with each set of samples;

- **laboratory equipment blanks.** - Laboratory equipment blanks will be analyzed to monitor potential contamination of samples due to improper or ineffective cleaning of equipment. These samples will be analyzed at a rate of no less than five percent (one for every 20 samples) of the total samples;

- **quality control samples.** - QC samples will be analyzed to monitor for accuracy of data generated. EPA QC samples or samples purchased from a reputable independent source will be submitted to off-site laboratories as blind samples for chemical analysis of a set of selected analytes approved by NMED at the beginning of the facility operation and also at regular intervals during the facility operating life;

- **surrogates.** - Surrogates will be analyzed in accordance with EPA guidelines for organics analysis. Surrogate recovery is a measure of the effectiveness of the analytical process. Surrogates will be tested on no less than a five percent (one for every 20 samples) basis for any analysis of organic compounds;

- **calibration standards and devices.** - Calibration standards and devices will be used in accordance with the manufacturers' recommended guidelines to calibrate laboratory instrumentation; and

- **internal standards** - Internal standards prepared in the laboratory will be referenced against external standards to measure accuracy.

Laboratory QC procedures will be included in the laboratory QA manuals prepared by each laboratory.

4.7.2.4 Laboratory Quality Control

QC objectives for the analytical data are a means of checking and controlling the sources of error in analytical data results. The criteria for data evaluation include assessing the data accuracy, precision, completeness, representativeness, and comparability. The criteria are described below:

- **accuracy.** - Accuracy is a measure of the error between chemical analytical results and the true sample concentrations. Accuracy is a measure of the bias in a system and will be expressed as the percent recovery of spiked samples. Accuracy will be presented as percent recovery and will be calculated as follows:

  $\%R - (S-U) \text{ X } 100\%C_{sa}$
  where
  %R = percent recovery
  S = spike sample analytical result
  U = sample analytical result
  C_{sa} = known spike concentration

- The data quality objectives (DQOs) for accuracy for each analytical method will be presented in the laboratory QA manual;

- **precision.** - Precision is a measure of data variability. Variability can be attributed to sampling activities and/or chemical analysis. Relative percent difference (RPD) will be used to assess the precision of the sampling and analytical method and will be calculated as follows:

  $RPD = [*C_1 - C_2*/(C_1 + C_2)/2)] \text{ x } 100$
  where
  RPD - relative percent difference
  C_1 = larger of the two concentrations
  C_2 = smaller of the two concentrations

- The DQOs for precision for each analytical method will be presented in the laboratory QA manual;

- **completeness.** - Completeness will be evaluated to assess whether a sufficient amount of valid data is obtained. Completeness is described as the ratio of acceptable measurements. Completeness will be calculated as follows:

C = (Number of samples having acceptable data)/(total number of samples analyzed) x 100%
where
C = completeness

- The DQOs for completeness will be presented in the laboratory QA manual;

- **representativeness.** - Representativeness is a qualitative parameter related to the degree to which the sample data represent the specific characteristics of concern. Procedures in sample collection will be implemented to assure representative samples, such as repeated measurements of the same parameter from the same waste stream in the same shipping container over several distinct sampling events. Any procedures or variations that may affect the collection or analysis of representative samples will be noted and the data qualified as appropriate; and

- **comparability.** - Comparability is a qualitative parameter related to whether similar sample data can be prepared. To assure comparability, analytical results will be reported in appropriate units for comparison with other data (such as past studies or clean-up standards), and the standard collection and analytical procedures included in this waste analysis plan will be implemented. Any procedures or variations that may affect comparability will be noted, and the data will be qualified as appropriate.

4.7.2.5 Analytical Procedures

Specific QA/QC procedures to be used for sampling, chain-of-custody, calibration, analytical methods, reporting, internal QC, audits, and preventative maintenance will be included in the laboratory QA manual.

Laboratory procedures and methods to be used will contain all of the information presented in the EPA document, SW-846, for each method. The format for each method will be similar to that used in SW-846. If there is no appropriate SW-846 method ASTM or other approved methods will be employed. The laboratory procedures and methods also will include the following:

- **scope.** - A description of the scope of applicability of the procedure;

- **principal.** - A brief description of the steps to be taken and/or the theory involved in the laboratory analysis;

- **interference.** - A description of known interfering agents that would cause difficulty in the laboratory analysis;
- **apparatus.** - A listing or description of equipment required to perform the laboratory analysis;

- **reagents.** - A listing of the reagents required, a description of the steps involved in preparing the reagents, and instructions on storage requirements and retention times;

- **procedures (instructions).** - An enumeration of the sequence of activities to be followed. The topics include sample preparation or pretreatment, sample storage requirements, instrument set-up, standardization or calibration, sample analysis, calculations, and glassware-cleaning procedures. The procedure includes any precautions, explanation, or clarifications needed to properly perform the analysis. These include safety precautions, the frequency of standardization required, the acceptance criteria or procedures for determining the acceptability of standard curves, clarification or special techniques critical to the analysis, and the procedure the analyst uses to determine the reliability of sample results based on the standard curves;

- **quality control requirements.** - A listing of the QC checks to be performed and the acceptance criteria used to evaluate the QC data; and

- **reference.** - A listing of the publications from which the information was derived in preparing the laboratory method. All references pertain to these documents. As a rule, laboratory methods are derived from the following publications:

    - *Standard Methods for the Examination of Water and Wastewater*, American Public Health Association;
    - *Annual Book of Standards*, American Society for Testing and Materials;
    - *Methods for Chemical Analysis of Water and Waste*, US Environmental Protection Agency;
    - *Test Methods for Evaluating Solid Waste*, SW-846, US Environmental Protection Agency;
    - *National Functional Guidelines for Organics Data Review*; and
    - *Laboratory Data Validation Functional Guidelines for Evaluating Inorganic Analyses*.

Editions used will be those currently specified in 40 CFR, as updated.

4.7.2.6 Laboratory Maintenance

The analytical laboratory will have in place a procedure that details the steps to be taken to calibrate and standardize instruments to ensure that analytical data produced are accurate. Records of all calibrations, preventative maintenance, and service calls will be readily available from the laboratory files. Calibration procedures will follow the method procedures outlined in the EPA document, SW-846, or the *Annual Book of [ASTM] Standards*.

A procurement procedure that identifies methods to be used to document and control the purchase of materials, parts, and services will be implemented by the laboratory and will be presented in the laboratory QA manual. The procedure will include identifying the quality of laboratory chemicals and equipment, management approval of procedure items, inspection of shipments for compliance with requirements, and isolation of nonconforming items to be returned to vendors. The quality of all equipment will conform to the requirements specified in the most current edition of the EPA document, *Handbook of Analytical Quality Control in Water and Wastewater Laboratories*, the Federal Register, or other regulatory agency publications. This procurement procedure will serve to ensure that spare parts routinely required will be readily available.

4.7.3 Requirements for Off-Site Laboratories

The facility will document that the following conditions are met for each off-site laboratory performing waste analyses for the facility:

- the laboratory will not be the same laboratory that was used by the generator;
- the laboratory must be approved by the facility;
- the laboratory must use the analytical methods identified in Section 4.5;
- if there is more than one analytical method for a specific test identified in Section 4.5, the laboratory must follow the guidance in Chapter Two of the current version of EPA document SW-846 to determine the appropriate analytical method; and
- the laboratory must follow the QA/QC requirements described in this waste analysis plan.

4.7.4 Laboratory Requirements for Foreign Generators

The facility will ensure and document that laboratory analysis provided by foreign generators is performed by a laboratory accredited or certified for the appropriate hazardous waste field of testing (FOT) by an authority using the USEPA's National Environmental Laboratory Accreditation Conference standards.

4.8 WASTE TRACKING

To identify and track the waste managed at the facility, a facility-specific number will be assigned to each waste stream and to each shipment within that waste stream. Each waste shipment will be tracked using a unique alphanumeric designation. This designation will identify the generator, a sequential number specific to the shipment, substance and source and the delivery date (or, in the case of site-generated waste, the date the waste entered the system). An example is presented below:

ABC-0001-043099
where
ABC identifies the generator
0001 identifies the waste stream, source, and shipment
043099 is the date the waste was delivered.

The waste numbering system will assist in the tracking of waste as it moves through the facility. The number will be recorded on:

- all incoming paperwork from the generator;
- samples received from the generator;
- samples taken on site; and
- site-generated records.

The date will not be recorded until the waste actually arrives on site. This numbering system will allow the facility to track a specific waste with regard to analyses conducted, necessary treatment, and the final disposition of the waste. In addition, assigning a unique designation to each generator and a unique number to each waste stream from that generator will make possible determining the amount of waste from a given waste stream that has been received by the facility. Individual shipments from within the waste stream will

receive an additional identifier to enable the facility to tie information back to the specific shipment as well as to the waste stream. The system will allow the facility to locate the current position of the waste at the facility, including the location of the waste in the landfill.

Tracking waste in this manner will allow the facility to determine the efficiency and accuracy of a generator's profiling efforts and the rejection rate for incoming waste. This information will be used to assist facility operations in determining the rate of fingerprint analysis required for a given generator.

The facility number will designate waste generated on site. All other numbering and tracking will be the same for all waste managed at the facility. The tracking system will be maintained in the facility records as either hard copy or electronically (computer database).

4.9 NOTIFICATION, CERTIFICATION, AND RECORDKEEPING

The facility will maintain a facility Operating Record in accordance with 40 CFR 264.73. The Operating Record will include:

- all analytical results;
- all chain-of-custody forms;
- generator notices of restricted wastes not meeting treatment standards or exceeding levels specified in RCRA Section 30049(d), including the information listed in 40 CFR 268.7(a)(1); and
- generator notices of restricted wastes meeting applicable treatment standards and prohibition levels, including the information in 40 CFR 268.7(a)(2).
- all final disposition records;
- all manifest and waste discrepancy resolution documentation; and
- all other information (e.g., notifications, certifications, waste analysis reports, waste movements) which will be maintained in the Operating Record as noted in this waste analysis plan.

As required in 40 CFR 268.7, the following records will be maintained at the facility for wastes generated on-site, and/or documentation of treating restricted wastes:

- where on-site generated wastes are characterized to determine compliance with LDR standards using only process knowledge, all data used to make any such determination. This data will be maintained by site personnel;
- where a representative sample of waste is analyzed to determine compliance with LDR standards, all waste analysis information. This data will be retained on-site in facility files; and
- all notifications and/or certifications submitted by waste generators. These records will be maintained until facility closure as required in 40 CFR 264.73.

In addition, relevant inspection forms and monitoring data will be maintained on file at the facility. Files will be maintained for a minimum of three years (for inspection records and LDR notification), or until approval of facility closure (for inventory records).