

PERMIT ATTACHMENT 3
WASTE ANALYSIS PLAN

3.0 WASTE ANALYSIS PLAN

3.1 Introduction

The Hazardous Waste Storage Facility (HWSF) is located on White Sands Missile Range (WSMR) is used to store waste prior to shipment for off-site disposal. A detailed description of the HWSF and a discussion of the facility design and operation are provided in Permit Attachment 2.

The requirements for a Waste Analysis Plan (WAP) are established in the New Mexico Hazardous Waste Management Regulations at NMAC 20.4.1.500, incorporating 40 CFR §264.13, pursuant to NMAC 20.4.1.900, incorporating 40 CFR §270.14 (b) (2-3). These regulations require waste characterization through acceptable (process) knowledge, analysis, or historical data to provide all the information needed to store, and ultimately dispose of the waste, as required by 20.4.1.300 NMAC, incorporating 40 CFR §264.13 and 40 CFR §268.7.

This WAP will be periodically reviewed to ensure the plan is compliant with current regulations and WSMR waste streams. The most recent revision of this WAP will be maintained at WSMR as part of the required Operating Record. Should the requirement for revision be identified, the NMED will be notified and a permit modification to incorporate the revised WAP will be initiated.

3.2 Waste Characterization Objectives

The WAP describes the procedures used to obtain sufficient waste information to operate the HWSF and the hazardous waste sampling and analytical procedures routinely conducted.

It addresses the following specific items: 1) waste characteristics; 2) current waste sources; 3) sampling procedures; 4) chemical and physical analysis; 5) incompatible wastes; 6) quality assurance/quality control (QA/QC) procedures and 7) recordkeeping.

NMED has established data quality objectives (DQOs) for WAPs, to ensure that regulatory requirements of the Resource Conservation and Recovery Act (RCRA) are met. These DQOs include:

1. To determine information needed to treat, store and dispose of the wastes in accordance with New Mexico's Hazardous Waste Regulations 20.4.1.500 NMAC, incorporating 40 CFR §264.13 (a)(1);
2. To determine if the waste is hazardous as required by 20.4.1.300 NMAC, incorporating 40 CFR §262.10 (b) and §262.11;
3. To determine the hazardous constituents in a waste stream to identify all applicable hazardous waste codes and all underlying hazardous constituents as required by 20.4.1.300 NMAC, incorporating 40 CFR §262.11, 20.4.1.800 NMAC, incorporating §268.7 (a)(1) and (2), and §268.9 (a);
4. To determine whether the waste must be treated before it can be land disposed as required by 20.4.1.800 NMAC, incorporating 40 CFR §268.7 and §268.9;
5. To determine whether a routine waste generating process has changed sufficiently to create a new waste stream and alternative regulatory requirements as required by 20.4.1.800 NMAC, incorporating 40 CFR §264.13 (a)(3)(i), §268.7 (a)(3)(iii), and §268.7 (b)(3)(ii);
6. To facilitate appropriate waste packaging for transportation as required by 20.4.1.300 NMAC, incorporating 40 CFR §262.10 (h);
7. To determine the presence and concentration of wastes constituents that might cause unlawful air emissions as required by 40 CFR §270.25 (a), §264.179, §264.200, §264.13 (b)(6), and §264.1082.

8. To ensure that wastes are not inappropriately diluted to avoid treatment requirements as required by 20.4.1.800 NMAC, incorporating 40 CFR §268.3;
9. To determine the presence of prohibited waste as required by 40 CFR §268.50;
10. To determine the presence of free liquids in wastes as required by 40 CFR §270.15 (b)(1), and §264.13 (b)(6);
11. To determine waste/waste and waste/container compatibility characteristics as required by 40 CFR §270.15, §270.16, §264.172, §264.177, and §264.199; and
12. To determine waste ignitability and reactivity characteristics as required by 40 CFR §270.16 (j), §264.17, and §264.198.

3.3 Waste Analysis Approach

3.3.1 Acceptable (Process) Knowledge

The HWSF receives waste that is generated from numerous buildings and shops on WSMR. For many of these waste streams, acceptable (process) knowledge can be used to make a waste characterization using data developed under 40 CFR Part 261, or existing published or documented data on the waste or on waste generated by a similar process, as specified in 40 CFR §264.13(a)(2). For example, the generator of a waste stream may know and be able to document that none of the constituents in each waste are hazardous. For other waste streams, analytical samples have been historically collected and used to make waste characterizations.

The characterization for a waste stream, whether it is based on acceptable (process) knowledge or historical data must be reevaluated any time the process generating the waste is changed or the knowledge of process or safety data sheet has changed. Waste streams that have been combined must be analyzed and the proportion of each waste reported.

Some waste delivered to the HWSF cannot be characterized by one of the above methods. Samples of these wastes are collected and analyzed to draw conclusions about the waste characteristics and disposal requirements. Many of these waste streams are generated while fulfilling the mission of WSMR. Subsequent wastes from the same process are then characterized by the results of the initial sample. In accordance with 40 CFR §264.13 (a)(3) and 40 CFR §264.13(b)(4), additional samples from the same waste stream are collected when:

- There is reasonable doubt about the identity of the waste;
 - The process generating the waste has changed such that the characteristics of the waste may change;
- or
- Confirmation is needed that the analysis is current.

3.3.2 Identification/EPA Classification of the Hazardous Waste Managed

Many of the activities conducted at WSMR, in support of its diverse missions, generate waste streams with the potential to be hazardous. The potentially hazardous waste streams can be assigned to one or more waste generating activity groups identified at WSMR.

Activities within a group generate similar types of waste by virtue of having similar functions. Through the analysis and characterization of numerous waste streams, the constituents likely to be found in each of the major activity groups can be identified. The knowledge of the processes and the associated waste streams is used to select the appropriate analytical parameters for sampling and avoid unnecessary sampling.

To ensure that all waste characterization information is accurate, the following determinations will be made:

1. Whether the waste was characterized at the point of generation, in compliance with 20.4.1.800 NMAC, incorporating 40 CFR §268.7(a)(3) and §268.9(c);
2. Whether routinely generated wastes are re-evaluated annually to ensure that the characterization is accurate and current and in compliance with 40 CFR §264.13(a)(3);
3. Whether generator have appropriately identified when the processes or activities that routinely generate the waste have changed; in compliance with 20.4.1.500 NMAC, incorporating 40 CFR §264.13(a)(3)(i).

The major waste categories, the specific waste type, their respective parameters of concern for analysis, and Environmental Protection Agency (EPA) waste codes are outlined in Table 3.1 in accordance with 40 CFR §264.13(b)(1) and (2). This table may not be a comprehensive list of all specific wastes but provides the framework for making decisions on chemical analyses for common WSMR waste streams. Many of the waste streams listed in the table can be characterized by acceptable (process) knowledge, on the basis of historical sampling and analytical data or other appropriate documentation such as Safety Data Sheets (SDSs), eliminating the need for additional analyses.

Table 3.1. Major Waste Categories and Parameters of Concern.

Waste Generation Activity	Waste Generated	Basis for Hazard Classification	Parameters for Analyses and EPA Waste Codes¹	LDR (WW or NWW)²
Research, Development, Testing and Evaluation (RDT&E)	Paint waste and solvent waste (I, T, listed)	KOP ³ , SDS, and Historical Test Data	Ignitability (D001), RCRA metals, solvents (VOCs and SVOCs)	NWW
	Rags contaminated with solvents and oil (I,T, listed)	KOP ³ , SDS, and Historical Test Data	Ignitability (D001), RCRA metals, solvents (VOCs and SVOCs)	NWW
	Solder waste (C)	SDS	Corrosivity (D002), silver (D011), lead (D008)	NWW
	Spent Laser dye solution (I)	KOP ³ , SDS	Ignitability (D001), solvents (VOCs and SVOCs)	NWW
	Used shop floor sweeping compound (T)	KOP ³ , SDS	RCRA metals	NWW
Installation Remediation Activity	Contaminated purge water (Listed)	KOP ³	RCRA metals, solvents (VOCs and VOCs) (F002), (F003), (F005)	WW
	Contaminated fuel/solvents (I, listed)	KOP ³	Ignitability(D001), solvents (VOCs and SVOCs)	NWW
	Contaminated soil (Listed)	KOP ³	RCRA metals, solvents (VOCs and SVOCs) (F002), (F003), (F005)	NWW
	Rags and debris contaminated with	KOP ³ , SDS, Historical Test Data	Ignitability (D001), RCRA metals, solvents (VOCs and SVOCs)	NWW

Waste Generation Activity	Waste Generated	Basis for Hazard Classification	Parameters for Analyses and EPA Waste Codes¹	LDR (WW or NWW)²
	solvents and oil (I,T, listed)			
	Used shop floor sweeping compound (T)	KOP ³ ,	RCRA metals	NWW
Vehicle Maintenance	Rags contaminated with solvents, oil and grease (I,T, listed)	KOP ³ , SDS, Historical Test Data	Ignitability (D001), RCRA metals, solvents (VOCs and SVOCs)	NWW
	Used fuel filters (I,T)	KOP ³ , Historical Test Data	Ignitability (D001), benzene (D018)	NWW
	Used Antifreeze (T)	KOP ³ , SDS, Historical Test Data	RCRA metals	NWW
	Paint waste and solvent waste (I, T, listed)	KOP ³ , SDS, and Historical Test Data	Ignitability (D001), RCRA metals, solvents (VOCs and SVOCs)	NWW
	Off-Spec. Fuels	KOP ³ , SDS, Historical Test Data	Ignitability (D001), VOCs and SVOCs	NWW
	Used shop floor sweeping compound (T)	KOP ³ , SDS	RCRA metals	NWW
Equipment Maintenance	Paint waste and solvent waste (I, T, listed)	KOP ³ , SDS, and Historical Test Data	Ignitability (D001), RCRA metals, solvents (VOCs and SVOCs)	NWW
	Rags contaminated with solvents, oil and grease (I,T, listed)	KOP ³ , SDS, and Historical Test Data	Ignitability (D001), RCRA metals, solvents (VOCs and SVOCs)	NWW
	Used fuel filters (I, T)	KOP ³ & Historical Test Data	Ignitability (D001), benzene (D018)	NWW
	Used Antifreeze (T)	KOP ³ , SDS, Historical Test Data	RCRA metals	NWW
	Off-Spec. Fuels	KOP ³ , SDS, Historical Test Data	Ignitability (D001), VOCs and SVOCs	NWW
	Used shop floor sweeping compound (T)	KOP ³ , SDS	RCRA metals	NWW
Shop Operations	Paint waste and solvent waste (I, T, listed)	KOP ³ , SDS, and Historical Test Data	Ignitability (D001), RCRA metals, solvents (VOCs and SVOCs)	NWW
	Rags contaminated with solvents and oil (I,T, listed)	KOP ³ , SDS, and Historical Test Data	Ignitability (D001), RCRA metals, solvents (VOCs and SVOCs)	NWW

Waste Generation Activity	Waste Generated	Basis for Hazard Classification	Parameters for Analyses and EPA Waste Codes^{1,4}	LDR (WW or NWW)²
	Solder waste (C)	SDS	Corrosivity (D002), RCRA metals	NWW
	Used shop floor sweeping compound (T)	KOP ³ , SDS	RCRA metals	NWW
Laboratory Activities	Spent solvent wastes (I,T,listet)	SDS	Ignitability (D001), solvents (VOCs and SVOCs)	NWW
	Corrosives (C,T)	SDS	Corrosivity (D002), RCRA metals	NWW
	Rags contaminated with solvents (I,T, listed)	KOP ³ , SDS, Historical Test Data	Ignitability (D001), RCRA metals, solvents (VOCs and SVOCs)	NWW
	Paint waste and solvent waste (I, T, listed)	KOP ³ , SDS, Historical Test Data	Ignitability (D001), RCRA metals, solvents (VOCs and SVOCs)	NWW
	Lab packs of expired chemicals (I, C, T, listed)	KOP ³ , SDS,	Ignitability (D001), corrosivity (D002), RCRA metals, solvents (VOCs and SVOCs)	NWW
Photographic Operations	Flammable liquids (I,T)	KOP ³ , SDS, Historical Test Data	Ignitability (D001), silver (D011), solvents (VOCs and SVOCs)	NWW
	Flammable corrosives (C,T)	KOP ³ , SDS, Historical Test Data	Ignitability (D001), silver (D011), solvents (VOCs and SVOCs)	NWW
Facility Maintenance	Paint waste and solvent waste (I, T, listed)	KOP ³ , SDS, Historical Test Data	Ignitability (D001), RCRA metals, solvents (VOCs and SVOCs)	NWW
	Rags contaminated with solvents and oil (I,T, listed)	KOP ³ , SDS, Historical Test Data	Ignitability (D001), RCRA metals, solvents (VOCs and SVOCs)	NWW
Paint and Solvent Recovery from Aerosol Can Recycling	Paint waste and solvent waste (I, T, listed)	KOP ³ , SDS, Historical Test Data	Ignitability (D001), RCRA metals, solvents (VOCs and SVOCs)	NWW
	Rags and debris contaminated with paint and solvent wastes (I,T, listed)	KOP ³ , Historical Test Data	Ignitability (D001), RCRA metals, solvents (VOCs and SVOCs)	NWW

¹ RCRA hazardous constituents and/or properties. Analysis may include full TCLP metals, if appropriate.

² Refer to 40 CFR §268.2 (d) and (f) for the definitions of wastewater (WW) and non-wastewater (NWW).

³ KOP is defined as knowledge of process or acceptable knowledge.

C = corrosive I = ignitable T = toxic R = reactive Listed = EPCRA and U- or P-listed wastes

⁴ Appropriate EPA test methods test methods (i.e., SW-846) are required to achieve the required or estimated detection limits as specified in the appropriate EPA methods. If equivalent methods are used, these will be justified and approved by NMED in advance.

3.4 Selecting Waste Analysis Parameters

When acceptable (process) knowledge or historical analytical data are not available, testing of waste streams is conducted to obtain a detailed chemical and physical analysis in accordance with 40 CFR §264.13. The objectives of sampling are to:

- Confirm characterizations of wastes for which prior analysis or acceptable (process) knowledge is not available;
- Determine compliance with applicable regulatory requirements, including Land Disposal Restrictions;
- Provide information to aid in the safe management of wastes, such as using biodegradable sorbents, if appropriate;
- Provide relevant data for use in making disposal decisions and,
- Resolve differences associated with inspections and generator descriptions.

The following subsections outline the procedures that will be followed to ensure that the objectives are met and that WSMR complies with all regulatory requirements for waste analysis.

3.4.1 Criteria and Rationale for Parameter Selection

Chemical analysis is conducted as needed to identify specific waste characteristics. Chemical analyses may vary, based on the knowledge of the processes generating the waste and the parameters of concern. Waste analysis parameters are selected to fulfill three criteria: waste identification, identification of incompatible or inappropriate wastes, and process and design considerations for container compatibility. The subsections below outline the rationale for the selection of these parameters in accordance with 40 CFR §264.13(b)(1).

3.4.1.1 Paint-related materials group

In general, uncharacterized waste associated with painting activities is analyzed to determine the presence of metals above toxicity characteristic levels. Metals such as cadmium and chromium are found in some types of paints used in specific shops. Paint-related waste may also be tested for ignitability. Waste associated with the chemical stripping of paint and the use of paint thinners may be tested for the presence of solvents or other semivolatile or volatile organic compounds (SVOC or VOC). Paint thinners, strippers, and rinse water associated with stripping may require testing for corrosivity, based on knowledge of the materials used in the process.

3.4.1.2 Vehicle and equipment maintenance waste

Vehicle and equipment maintenance activities generate a variety of waste streams with different characteristics. However, similar constituents are found in these waste streams. Because some waste or used fuels contain lead, cadmium, or other metals, a metals analysis is conducted for all uncharacterized waste streams involving vehicle or equipment maintenance. VOCs and SVOCs are also typical components of fuels and lubricants and should be tested for in uncharacterized waste streams associated with fuel or lubricant use. Waste associated with parts cleaning and/or waste that may have come in contact with solvents should also be tested for TPH and also VOCs and SVOCs, as halogenated and non-halogenated solvents can be identified by these analyses. Finally, because many of these waste streams are associated with fuels or ignitable substances, ignitability testing may be appropriate.

3.4.1.3 Shop Floor Sweeping Compound Waste

Shop floors, for some activities, are sprinkled with sweeping compound. This material helps to pick up dust and dirt from the floors. In soldering, welding and cutting processes, particulates can be generated and swept up with the sweeping compound. In other instances, a sweeping compound is used to absorb oils or other liquids from the floor. This waste group may be tested for RCRA metals, which could be present at levels that make the waste characteristic for toxicity and VOCs, or SVOCs as appropriate

depending on the activity and products mixed with the sweeping compound.

3.4.1.4 Installation Remediation Activities

Waste generated from Installation Remediation activities include environmental media (e.g. soil, groundwater) and contact-waste (e.g. personal protective equipment (PPE), decontamination solutions, debris, etc.). These wastes can vary widely and are addressed on a case-by-case basis. Work Plans are prepared for each investigation or remediation project. Management of any waste expected to be generated is discussed in the Work Plan.

3.4.1.5 Photographic Operations

Metals are the primary concern in wastes from photographic operations. Mercury is found in photo imaging paper and should be tested for, in uncharacterized waste streams associated with this paper. Other metals such as cadmium, selenium, and silver are found in wastes such as photo-fixing solution and silver recovery cartridges. These metals are often present at levels that make these wastes characteristically toxic. In addition, VOCs and the corrosivity of uncharacterized waste streams may also be tested.

3.4.1.6 Aerosol Can Puncturing Activities

RCRA-empty aerosol cans are collected for scrap metal recycling. They are then punctured by a device commonly called a “can popper.” Any residual liquid contents in the aerosol cans are captured by draining into a drum. The collection drum is kept closed, except when actively puncturing cans. The recovered liquids are accumulated until the drum is nearly full. Analysis is performed for VOCs, SVOCs, ignitability and RCRA metals, based on knowledge of the various products contained in aerosol cans around WSMR activities and RCRA characteristics, as applicable. Aerosol cans that cannot be punctured such as foams, pesticides, and adhesives are managed under waste characterization procedures for disposal.

3.4.1.7 Miscellaneous

Spill cleanups and lab packs are other waste streams that can occur. These waste types are not generated on a regular basis, and the waste characteristics change depending on the material spilled. These wastes will be addressed on a case-by-case basis, and knowledge of the material spilled could form the basis for selecting analyses to run. Lab packs result from the decision to discard expired shelf-life products and materials that can no longer be used. SDS sheets can provide the basis for performing a hazardous waste determination or for determining the analyses required.

3.4.1.8 Other Analyses to Support Treatment Alternatives

In addition to the specific analyses identified in Table 3.1, other analyses such as thermal content British Thermal Units (BTUs) may be conducted to provide information regarding treatment alternatives. Current analytical methods are provided, but these are suggested methods and are not meant to be restrictive of the analyses that can be performed. In many cases, additional analytical methods for constituents may be appropriate. The methods are intended to serve as a guide and could be substituted for other, more relevant or more current methods as they are developed. The analytical laboratory may be consulted prior to sampling events to ensure that the most up-to-date methods are used for analysis.

3.4.2 Special Parameter Selection and Procedural Requirements

Additional waste analysis and procedural requirements for wastes may be necessary in special cases; specifically for ignitable, reactive, and incompatible wastes, and to comply with LDR requirements.

3.4.2.1 Ignitable, Reactive and Incompatible Wastes

Parameters are chosen to ensure the proper storage and disposal of these wastes in accordance with 40 CFR §264.17(b), by preventing reactions which:

- Generate extreme heat or pressure, fire or explosions, or violent reactions;

- Produce uncontrolled toxic or flammable fumes or gases;
- Damage the structural integrity of the containers or the HWSF; and
- Threaten human health or the environment.

The same waste analysis approach is employed for determining the characteristics of ignitable, reactive, and incompatible waste is outlined in Part 2.4.2.1 of this permit, in accordance with 40 CFR §264.17(c). All sampling and analytical procedures used for waste characterization, with the exception of hydrazine wastes, shall be performed in accordance with the most recent version of Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, (U.S. EPA Publication SW-846) or an equivalent method with prior NMED approval.

The procedure for properly handling ignitable, reactive, and incompatible wastes at the HWSF are outlined in detail in Part 3.11 (Special Provisions for Ignitable or Reactive Waste) of the Permit and as specified by 40 CFR §264.17(a).

3.4.2.2 Land Disposal Restrictions

The hazardous wastes stored at the HWSF are prohibited from land disposal if contaminant concentrations exceed levels listed in 40 CFR §268, Subpart D. Containers of such wastes are stored solely for the purpose of accumulation of quantities necessary to facilitate proper recovery. In accordance with NMAC 20.4.1.800, incorporating 40 CFR §268.50, these wastes will be stored for less than one year. Each container is clearly marked to identify its contents, quantity, and the accumulation start date. When generated waste is determined restricted from land disposal, all supporting data used to make the determination are kept on file per 40 CFR §268.7(a)(6)(ii).

Before shipping hazardous waste off site, a determination will be made as to whether the waste needs treatment before it can be land disposed. In accordance with the LDR regulations outlined in 40 CFR § 268.7, hazardous wastes must meet the applicable LDR treatment standards contained in 40 CFR Part 268, Subpart D. This determination will be made by either acceptable (process) knowledge or testing. If it is known that the waste does not meet applicable LDR treatment standards based on acceptable (process) knowledge or historical analytical results, no testing is necessary. Additional testing, if necessary, will be conducted only to certify that the waste meets LDR treatment standards. Each waste for which a treatment standard has been set will be evaluated for the applicable parameters in 40 CFR Part 268, Subpart D. In addition, for any wastes that exhibit the hazardous characteristics of ignitability, corrosivity, reactivity, or toxicity, the underlying hazardous constituents shall be determined in accordance with 40 CFR §268.9. All analytical results generated in support of LDR requirements shall be retained within the Operating Record.

Wastes resulting from WSMR operations that exceed the applicable LDR treatment standards will be sent off site to a permitted treatment facility. LDR notifications, and any additional data as required by 40 CFR §268.7(a)(2), will be supplied with the shipment of each waste. Wastes that are determined through analysis to meet treatment standards as specified in 40 CFR Part 268, Subpart D, can be land-disposed in a permitted facility without further treatment. An LDR certification, including data to support the certification as required by 40 CFR §268.7(a)(3), will be prepared and accompany the shipment of waste to the receiving facility.

3.5 Sampling and Analysis Plan

This section presents the Sampling and Analysis Plan (Plan) for waste managed at the HWSF.

3.5.1 Objectives

The Plan provides procedures for testing the waste streams requiring analytical characterization that are stored in the HWSF. It explains how samples will be collected and the analyses that will be performed. The

plan's design is based on knowledge of the materials used at WSMR and knowledge of the characteristics of categories of waste. Specific topics covered in this plan include:

- Sampling procedures and methodology;
- Sampling QA/QC Procedures;
- Sample Container Preservation Requirements; and
- Laboratory procedures

Samples collected shall be prepared according to the most current appropriate EPA sample protocol. If EPA methods are not available, ASTM methods are used.

Proper waste identification will be ensured by the following measures:

- A waste profile form will be prepared for each new waste stream to identify the process and characterize the waste;
- An annual review of waste stream will be conducted to determine waste inconsistency with the waste profile and whether additional sampling is warranted;
- Waste generators identify when new material is introduced into process for determination of the need for re-evaluation of the waste stream.

3.5.2 Sampling Methodology

In many cases, samples from containers containing waste will be collected for characterization. This section outlines the procedures and methods to be followed for sampling containers containing liquid and non-liquid organic and inorganic wastes. Sample handling, sample documentation, and sampling quality assurance and quality control are outlined in subsequent sections.

The physical, chemical, and waste-specific parameters of each waste are considered to determine the most appropriate type of sampling equipment and sampling strategy. Sampling personnel will be knowledgeable of, and have experience with, the sampling techniques outlined below.

As part of the inventory, a visual inspection of the container and its contents is conducted. Once a visual inspection inventory has been completed, the container to be sampled is opened. Only sampling equipment constructed of materials that are compatible with wastes and not susceptible to reactions that might alter or bias the physical or chemical characteristics of organic and inorganic wastes is used.

To ensure proper characterization of the waste in situations where acceptable knowledge is not sufficient to make a complete hazardous waste determination, a representative sample is collected. Because the physical state of the hazardous waste stored at the HWSF may vary from free liquid to solids, the representative sample must be tailored to these physical states. Generic sampling procedures are described below.

For liquid wastes, the representative sample is a grab sample per container taken by an appropriate sampling device such as a composite liquid waste sampler (Coliwasa), per the most recent EPA Guidance SW-846 *Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods* or other NMED approved methods. The sampling device and decontaminated sample containers are made of glass or fluorinated ethylene propylene (FEP) plastic to guard against loss or cross contamination of volatile organics. If a container has only one bung opening, the sample is taken from that opening such that the entire depth of the container is sampled and then analyzed. If the container potentially demonstrates liquid stratification or sediment settling, sampling methods detailed in ASTM procedures will be used. These include Method D5743-97 (Standard Practice for Sampling Single or Multilayered Liquids, With or Without Solids, in

Drums or Similar Containers) or Method D5956-96 (Standard Guide for Sampling Strategies for Heterogeneous Wastes, as they may be updated).

For containers containing sludges or solid wastes, a representative sample is taken using the appropriate sampling protocol as listed in 40 CFR Part 261, Appendix I. This includes: 1) ASTM Method D140-70 for extremely viscous liquid; 2) ASTM D346-75 for crushed or powdered material; 3) ASTM D420-69 for soil or rock-like material; 4) ASTM 1452-65 for soil-like material; 5) and ASTM D2234-76 for fly ash-like material. These methods specify the sampling device and appropriate procedure for collecting the sample.

For wet materials, it is necessary to identify whether the waste will or could generate free liquids, as defined at 40 CFR Part 260. The presence of free liquids can be identified by visual inspection of the container or by conducting the paint filter test (EPA Method 9095).

These tests will be conducted to determine whether the waste contains or could generate free liquids.

Contact-waste, such as gloves, rags, or other non-liquid wastes, may be sampled or they may be characterized based on knowledge of the contaminating process. In the event of a release/spill to the ground, contaminated soil may be sampled or may be characterized based on knowledge of the spilled material.

3.5.3 QA/QC Procedures

The quality assurance (QA) process ensures that all decisions made about waste characterization and the data used are technically based, and that proper documentation is maintained. Quality control (QC) tools are used to measure whether the QA objectives are met.

Sampling for waste characterization 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*). Quality assurance for sampling will apply to all samples for waste characterization. The QA program for sampling includes requirements for the following:

- Training requirements for sampling personnel, including QA/QC procedures and proper sampling techniques
- Chain-of-custody protocols for tracking samples
- Review of procedures by sampling personnel to ensure proper use of equipment
- Procedures for equipment maintenance
- Procedures for field sampling QC
- Documentation of sampling locations.

All sampling conducted for the purpose of characterizing wastes will use appropriate QA/QC procedures. Additionally, WSMR will ensure that waste characterization information is accurate by making the following determinations:

- Whether the waste was characterized at the point of generation, in compliance with 40 CFR §268.7(a)(3) and §268.9(c);
- Whether routinely generated wastes are re-evaluated (or re-profiled), at least annually, to ensure the waste's characterization is accurate and up to date, in compliance with 40 CFR §264.13(a)(3);
- Whether SAP operators have appropriately identified when the process or operation generating routinely generated wastes has changed, in compliance with 40 CFR §264.13(a)(3)(i); and
- Whether persons preparing hazardous waste determinations are trained in the applicable waste characterization requirements as required by 40 CFR §264.16.

3.5.4 Sampling Procedures

3.5.4.1 Documentation of Activities

Sample containers will be uniquely identified with the following information:

- Collector's initials;
- Sample identification;
- Analytical methods requested;
- Generating facility;
- Sample date; and
- Sample time.

3.5.4.2 Contamination Control

Only compatible sampling tools and containers will be used for sample collection and storage. Sampling tools and equipment will be protected from contamination sources prior to sampling and will be decontaminated before and between samples, if reused. Sample containers will also be protected from contamination sources. Sampling personnel will wear clean chemical-resistant gloves when handling sampling equipment and samples. Gloves will be decontaminated or disposed of between samples.

3.5.4.3 Chain of Custody

Chain-of-custody (COC) forms will be used and procedures will be followed to track possession of the samples from the time they are collected until the analytical data from the samples are received and recorded. For all samples, procedures will begin once sampling is complete. The following information will be recorded when samples of waste are collected:

- The type of waste collected, and a brief description;
- Requested test methods;
- The names and signatures of the samplers;
- The sample number and the date and time of sample collection;
- The names of any persons involved in transferring samples; and
- The shipping number (e.g., air bill number) for samples shipped to off-site laboratories.

A sample will be considered under custody if it is: in the possession of the sampling team; in view of the sampling team; or transferred to a secure area.

3.5.4.4 Container and Preservation

Samples will be collected in new, pre-cleaned sampling containers and will be kept cold during storage and transportation as necessary. Containers, preservatives, and holding time requirements will be determined based on EPA method requirements or direction from the analytical laboratory.

At the end of each sampling event, samples will be carefully packaged to prevent damage during transport or shipping. Each shipping container will be shipped to an analytical laboratory by an overnight delivery service, transported directly by a contracted laboratory, or transported directly to the laboratory.

3.5.5 Laboratory Analysis

Each laboratory used to conduct analyses 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 to demonstrate analytical Quality Assurance/Quality Control (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 procedures to be completed and the laboratory control limits will be included in the QA manual for each laboratory used. QA/QC procedures will follow those in the most recent appropriate EPA methods. The following is a summary of the laboratory specifications. The laboratory report will contain the following:

- Unique laboratory identification;
- Sample identification;
- Sampling date;
- Preparation date;
- Analysis date;
- Preparation batch;
- Preparation method;
- Analysis batch;
- Analysis method;
- Analyte;
- Results;
- Footnotes/data qualifiers;
- Units;
- Sample matrix;
- Method detection limit and reporting limit;
- Dilution factor;
- Case narrative (if necessary); and
- Laboratory control sample results.

Appropriate EPA methods address most of the procedures proposed in this Plan. The laboratory will be required to achieve the required or estimated detection limits specified in the appropriate EPA methods. If equivalent methods are used, these will be justified and approved in advance. NMED-approval is required for any equivalent methods employed by the laboratory. Analytical method detection limits and reporting limits shall not be higher than the LDR treatment standards listed in 40 CFR §268.40.