

PERMIT ATTACHMENT F1

RATIONALE FOR ANALYTICAL PARAMETER SELECTION Modified from the Permit Application, Volume I, Section 4.5.1

4.5.1 Analytical Parameters

The analytical parameter lists for pre-acceptance waste characterization, fingerprint analysis, and additional unit-specific analysis are presented in Permit Attachment F, *Waste Analysis Plan*, Tables 4-1, *Parameters and Methods for Pre-Acceptance Representative Sample Analysis*, 4-2, *Tests and Analytical Methods for Fingerprint Samples*, and 4-3, *Additional Tests and Analytical Methods*. The facility will augment these lists as necessary, to ensure additional considerations pertaining to waste-stream specific pre-acceptance characteristics, LDR standards analysis, and other facility operational limits are met. The rationale used to determine pre-acceptance characterization is specified in Section 4.5.1.1. The rationale for selecting additional parameters to ensure compliance with the LDR standards is specified in Section 4.5.1.2. The rationale for selecting parameters to ensure compliance with other facility regulatory and operational limits is contained in Section 4.5.1.3. For each waste stream accepted, treated, and disposed of at the facility, appropriate parameters will be selected to ensure that each of the facility acceptance criteria (see Permit Attachment F, Section 4.2, *Criteria for Waste Management at the Facility*), is met.

4.5.1.1 Parameters for Waste Characterization

Permit Attachment F, Table 4-1 specifies parameters to confirm that a waste stream agrees with the information provided by the generator. The rationale for the selection of these parameters is as follows:

- **total volatile organic compounds (VOCs).** - This test will determine the presence and concentration of individual VOCs;
- **total semi-volatile organic compounds (SVOCs).** - This test will determine the presence and concentration of individual SVOCs;
- **metals and inorganic constituents.** - These tests will determine the presence and concentrations of individual metals and other inorganic constituents;
- **physical appearance.** - This test determines the general identity of the waste and establishes baseline characteristics that can then be subjectively compared with the waste shipment when it arrives at the facility. The waste is visually inspected and the physical appearance of the waste is recorded, including, at a minimum, the following properties: Color, physical state (solid, semi-solid, or liquid), texture, viscosity, layering (single phase, bi-layer, multi-layer) and presence of free liquids;
- **pH.** - This test indicates the corrosive nature of the waste. It also determines compatibility with other wastes and with containers or liners, and treatment requirements. The tolerance range for pH is plus or minus 2.5 pH units; and
- **radioactivity screen.** - This test screens each load using a gamma ray scintillation detector or other appropriate equipment. This test will be used to ensure that the level of radioactivity observed in NORM waste or equipment from oil, gas, and water production containing hazardous constituents, or other naturally occurring radioactive materials not regulated under 20.3.1.14 NMAC, is not above

regulated limits as defined in 20 NMAC 3.1, Subpart 14 (i.e., the maximum radiation exposure reading at any accessible point does not exceed 50 microrentgens per hour (Φ R/hr), and the maximum radiation reading for sludges and scales contained in oil, gas, and water production equipment does not exceed 50 Φ R/hr, or, if the radiation readings for removable sludges and scales exceed 50 Φ R/hr, the concentration of radium 226, in a representative sample, does not exceed 30 picocuries (30pCi/g)). (Material regulated under the Atomic Energy Act of 1954, as amended, is not permitted for waste management).

4.5.1.2 Additional Analysis to Ensure Compliance with the LDR Treatment Standards

The facility will ensure that LDR treatment standards are met by identifying the appropriate treatment standard requirements as follows:

- **total waste standards.** All hazardous constituents in the waste or in the treatment residue must be at or below the values for these constituents contained in the Table in 40 CFR 268.40
- **waste extract standards.** The hazardous constituents in the extract of the waste or in the extract of treatment residue must be at or below the values found in the Table in 40 CFR 268.40, and
- **technology standards.** The waste must be treated using the technology specified in the Table in 40 CFR 268.40.

Identification of parameters to demonstrate compliance with LDR standards will be conducted as follows:

- identification of all hazardous applicable characteristic and listed EPA Hazardous Waste Numbers;
- identification of the appropriate subcategory for each applicable EPA Hazardous Waste Number (from the most current version of the Table in 40 CFR 268.40);
- determination of wastewater/nonwastewater status for the waste stream;
- identification of all underlying hazardous constituents for each applicable EPA Hazardous Waste Number (from the most current version of the Tables in 40 CFR 268.40 and 268.48; and
- selection of the most current versions of the analytical methods associated with all identified hazardous wastes, underlying hazardous constituents, subcategories, and wastewater/nonwastewater status (from Table 4-2, SW-846, or equivalent).

The rationale for the selection of additional parameters to ensure compliance with the LDR standards is as follows:

- **total organic carbon (TOC).** - This test determines the total organic carbon concentration of the waste and is needed to determine whether the waste is a wastewater or nonwastewater;
- **total suspended solids (TSS).** - This test determines the total suspended solids concentration of the waste and is needed to determine whether the waste is a wastewater or nonwastewater;
- **ignitability.** - This is a qualitative test to determine the ignitable nature of the waste, indicate if the waste is prohibited, and determine treatment requirements. It also helps to determine whether the

waste is compatible with containers, tanks, liners, piping, structures, equipment, and other waste streams;

- **explosive meter vapor test (TLV sniff test).** - This test determines the fire-producing potential of the waste and whether it is regulated as flammable or combustible by the US Department of Transportation. If liquid waste exceeds 200 ppm, the waste will also be tested for ignitability using the flash point test. The tolerance range for the TLV sniff test is plus or minus 200 ppm;
- **flash point test.** - This test determines the flash point of the waste and determines whether the waste is ignitable;
- **pH.** - This test indicates the corrosive nature of the waste. It also determines compatibility with other wastes and with containers or liners, and treatment requirements. The tolerance range for pH is plus or minus 2.5 pH units;
- **reactive sulfide.** - This test determines the reactive nature of the waste, indicates if the waste is prohibited, and determines treatment requirements. It is also used to determine whether the waste is compatible with containers, tanks, liners, piping, structures, equipment, and other waste streams. Wastes containing total releasable sulfide with concentrations less than 500 ppm are considered non-reactive.
- **reactive cyanide.** - This test determines if cyanide could potentially be reactive under acidic conditions, indicates if the waste is prohibited, and determines treatment requirements. It also determines whether the waste is compatible with containers, tanks, liners, piping, structures, equipment, and other waste streams. Wastes containing total releaseable cyanide with concentrations less than 250 ppm are considered non-reactive;
- **reactivity (compatibility).** - This test determines the compatibility between the waste and the liner, tank, container, or equipment which the waste may contact.

The facility will ensure that potentially incompatible wastes will not be stored, treated, or disposed of in the same location. The facility will perform a compatibility determination based on the pre-acceptance waste characterization information. Acceptable knowledge or assessment information provided on the Waste Profile Form may be used to assign compatibility codes to each waste type form based on 40 CFR 264, Appendix V. For wastes that will be mixed with other waste streams for the purpose of treatment, chemical analysis will be required to ensure the compatibility of the waste streams.

Chemical analysis will be accomplished in three steps, as appropriate for the waste being analyzed:

- ◆ an analysis of the waste for reactive cyanide and sulfide. This analysis will be used to determine the waste's potential to release dangerous levels of hydrogen cyanide or hydrogen sulfide gases in acidic conditions (i.e., pH less than 2);
- ◆ an evaluation of the reactivity characteristics of the waste through process knowledge and a series of analytical procedures that will test for the presence of reactive chemical groups. The procedures in the EPA document, *Design and Development of a Hazardous Waste Reactivity Testing Protocol*, EPA-600/2-84-057, February 1984, will be followed and the results used to assign the waste a reactivity group designation. Figure 4-3, Sequence of Procedure Sets for Determining Reactivity Group, summarizes the reactivity testing protocol; and

- ◆ use of the reactivity group designation contained in Figure 4-3 to evaluate compatibility of the waste with other wastes by comparing it to the compatibility matrix shown in Figure 4-4, Reactivity Group Designation. (Refer to EPA document, *A Method for Determining the Compatibility of Hazardous Wastes*, EPA-600/2-80-076, April 1980, and 40 CFR Part 264, Appendix V, for additional information on waste compatibility).
- **total volatile organic compounds (VOCs).** - This test will determine the presence and concentration of individual VOCs;
- **total semi-volatile organic compounds (SVOCs).** - This test will determine the presence and concentration of individual SVOCs;
- **metals.** - These tests will determine the presence and concentrations of individual metals and other inorganic constituents;
- **organichlorine pesticides.** - This test determines the pesticide concentration of the waste;
- **chlorinated herbicides.** - This test determines the herbicide concentration of the waste;
- **PCBs.** - This is a quantitative test to determine whether PCBs are contained in oil-bearing and other types of waste and to determine the concentration; and
- **leachate.** - Leachate must be tested for all leachate constituents listed in the Table in 40 CFR 268.40.

4.5.1.3 Additional Analysis to Ensure Compliance with Regulatory and Operational Limits

The rationale for the selection of additional parameters to ensure compliance with the facility's regulatory and operational limits is as follows:

- **radioactivity screen.** - See Section 4.5.1.1. This test will determine if the waste is prohibited from acceptance at the facility (see Section 4.1.2 for a list of prohibited wastes);
- **PCBs.** - See Section 4.5.1.2. This test will determine if the waste contains a prohibited concentration of PCBs;
- **VOCs (Subpart BB).** - These tests are conducted as required by 40 CFR 264.1063(d) to determine, for each piece of equipment subject to the requirements of 40 CFR, 264, Subpart BB, whether the equipment contains or exceeds 10 percent VOCs by weight. Applicable process knowledge may be used to make this determination;
- **VOCs (Subpart CC).** - These tests are conducted as required by 40 CFR 264.1084(a)(3)(iii) to determine, if wastes placed in tanks, the evaporation pond, and the stabilization bins are subject to the requirements of Subpart CC. A hazardous waste with a volatile organic concentration equal to or greater than 500 ppmw will be accepted only for storage in approved containers and direct disposal in the landfill;
- **dioxins and dibenzofurans.** - This test is conducted to ensure that the waste stream does not contain dioxins and/or dibenzofurans;
- **nonbiodegradable sorbent test.** - This test is performed as required by 40 CFR 264.314 (prohibition of liquids in landfills). This test is required if the facility determines that the generator

did not indicate whether a sorbent was added to the waste or indicates that a sorbent was added but did not specify the name and type of sorbent and whether it is nonbiodegradable. If any of this information is not present, the generator will be contacted for clarification. If uncertainty remains, 40 CFR 264.314(e)(1)(i-iii) will be reviewed. If the sorbent's biodegradability cannot be determined from the list or if the name of the sorbent is unknown, the material will be analyzed following one of the tests referenced in 40 CFR 264.314(e)(2). The facility will select one of the following tests:

- ASTM Method G21-70 (1984a) - Standard Practice for Determining Resistance of Synthetic Polymer Materials to Fungi;
 - ASTM Method G22-76 (1984b) - Standard Practice for Determining Resistance of Plastics to Bacteria;
 - OECD Test 301B - CO₂ Evolution (Modified Sturm Test) ASTM Method G21-70 (1984a) - Standard Practice for Determining Resistance of Synthetic Polymer Materials to Fungi; or
 - Other approved test method
- **total organic halogens (TOX).** - This test determines if concentrations of halogens in the waste are in compliance with the LDR treatment standards. It also determines if the waste contains constituents that could degrade a liner. Wastes containing TOX greater than 1,000 mg/l (based on TCLP extract) will not be placed in the evaporation pond or the landfill;
 - **free liquid content test (paint filter liquids test).** - This test is a qualitative test to determine the free liquids concentration contained within the waste matrix and will be used as a control parameter for wastes that are to be landfilled;
 - **toxicity characteristic leaching procedure (TCLP).** - This test must be used to obtain an extract of the waste where treatment standards are based on concentrations in the waste extract;
 - major ions and metals in non-leachate (sulfides and sulfates, radionuclides, VOCs, SVOCs, pesticides, PCBs, perchlorate, and TPH).

Figure 4-3, Sequence of Procedure Sets for Determining Reactivity Group

Figure 4-4, Reactivity Group Designation and Compatibility Matrix