

**ATTACHMENT G.17**  
**TECHNICAL AREA 54, WEST**  
**OUTDOOR CONTAINER STORAGE UNIT**  
**CLOSURE PLAN**

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## 1.0 INTRODUCTION

This closure plan describes the activities necessary to close the outdoor hazardous waste container storage unit at Technical Area 54 West, Building 38 (TA-54-38) at the Los Alamos National Laboratory (Facility), hereinafter referred to as the permitted unit. The information provided in this closure plan addresses the closure requirements specified in Permit Part 9 and the Code of Federal Regulations (CFR), Title 40, Part 264, Subparts G and I for hazardous waste management units at the Facility under the Resource Conservation and Recovery Act (RCRA) and the New Mexico Hazardous Waste Act.

Until closure is complete and has been certified in accordance with Permit Section 9.5, a copy of the approved closure plan or the hazardous waste facility permit containing the plan, any approved revisions, and closure activity documentation associated with the closure will be on file with hazardous waste compliance personnel at the Facility and at the U.S. Department of Energy (DOE) Los Alamos Site Office. Prior to closure of the permitted unit, this closure plan may be amended in accordance with Permit Section 9.4.8, as necessary and appropriate, to provide updated sampling and analysis plans and to incorporate updated decontamination technologies. Amended closure plans shall be submitted to the New Mexico Environment Department (Department) for approval prior to implementing closure activities.

## 2.0 DESCRIPTION OF UNIT TO BE CLOSED

A specific description of the permitted unit can be found in Permit Attachment A (*Technical Area Unit Descriptions*). Additional features and equipment located at the permitted unit and not discussed elsewhere within the Permit are described below.

The permitted unit is located on the north and east sides of TA-54-38 and consists of an asphalt pad (which slopes toward the north and east and has a thickness of approximately four inches) and a loading dock which measures 16 ft wide by 38 ft, 10 inches long. The loading dock is constructed of six inch cast-in-place concrete, is approximately 4 inches above grade, and is covered by a metal roof awning. Small storage sheds (1024 and 1025) for supplies and equipment and not for the storage of hazardous waste, are also located on the permitted unit. The entire permitted unit measures approximately 37,900 square feet.

The slope of the asphalt pad allows for storm water to run off the pad into a one inch wide trench drain that runs along the north edge of the pad. The eastern edge of the pad consists of an asphalt swale that collects storm water and conveys it to a single discharge point at the northeast corner of the site. An asphalt berm running from the extreme northern corner of Building 38 to the drain flanks the northern side of the permitted unit and an asphalt curb flanks the southern side.

The waste typically stored at the permitted unit consists of hazardous and mixed waste in both solid and liquid form. The permitted unit was constructed in 1993, became operational in 1998, and has been subject to waste management regulations under RCRA since its construction. In 2007, the boundaries of the permitted unit were expanded to include the current configuration. The stored wastes include corrosive liquids, sludge, debris, and chemical wastes with metals and volatile and semi-volatile organic constituents.

Permit Part 3 (*Storage in Containers*), Permit Attachment A (*Technical Area Unit Descriptions*), Permit Attachment B (*Part A Application*), and Permit Attachment C (*Waste Analysis Plan*) include information about waste management procedures and hazardous waste constituents stored at the permitted unit.

The Loading Dock, located just east of the low bay, is approximately 16 ft wide and 39 ft long and is constructed of cast-in-place concrete. A truck ramp, which is not part of the Loading Dock CSA, runs perpendicular to the loading dock platform. At the bottom of the truck ramp is a 38-inch-square grate covering a drainage culvert. The Loading Dock container storage area is divided into two areas on the platform; the first is an area at the north end of the loading dock which measures 16 ft by ten (10) ft. and the second area is at the south end of the loading dock which measures 16 ft by 12 ft. Waste drums of various sizes are stored in the Loading Dock.

### **3.0 ESTIMATE OF MAXIMUM WASTE STORED**

To date, approximately 612,755 gallons of waste has been stored in the permitted unit. Throughout the life of this Permit it is estimated that an additional 1,870,000 gallons of waste will be stored in the permitted unit.

### **4.0 GENERAL CLOSURE INFORMATION**

#### **4.1 Closure Performance Standard**

As required by Permit Section 9.2, the permitted unit will be closed to meet the following performance standards:

- a. remove all hazardous waste residues and hazardous constituents; and
- b. ensure contaminated media do not contain concentrations of hazardous constituents greater than the clean-up levels established in accordance with Permit Sections 11.4 and 11.5. For soils the cleanup levels shall be established based on residential use. The Permittees must also demonstrate that there is no potential to contaminate groundwater.

If the Permittees are unable to achieve either of the clean closure standards above, they must:

- c. control hazardous waste residues, hazardous constituents, and, as applicable, contaminated media such that they do not exceed a total excess cancer risk of  $10^{-5}$  for carcinogenic substances and, for non-carcinogenic substances, a target Hazard Index of 1.0 for human receptors, and meet Ecological Screening Levels established under Permit Section 11.5;
- d. minimize the need for further maintenance;
- e. control, minimize, or eliminate, to the extent necessary to protect human health and the environment, the post-closure escape of hazardous waste, hazardous constituents, leachate, contaminated runoff, or hazardous waste decomposition products to the ground, groundwater, surface waters, or to the atmosphere; and
- f. comply with the closure requirements of Permit Part 9 (*Closure*) and 40 CFR Part 264, Subparts G and I.

Closure of the unit will be deemed complete when: 1) all structures, surfaces, and equipment have been decontaminated, or otherwise properly disposed of; 2) closure has been certified by an independent, professional engineer licensed in the State of New Mexico; and 3) closure certification has been submitted to, and approved by, the Department.

## 4.2 Closure Schedule

This closure plan schedule is intended to address the closure requirements for the permitted unit within the authorized timeframe of the current Hazardous Waste Facility Permit (*see* Permit Section 9.4). The following section provides the schedule of closure activities (*see also* Table G.17-2 in this closure plan).

Notification of closure will occur at least 45 days before the Permittees expect to begin closure (*see* 40 CFR § 264.112(d)(1)) and closure activities will be according to requirements of 40 CFR § 264.112(d)(2). However, pursuant to 40 CFR § 264.112(e), removing hazardous wastes and decontaminating or dismantling equipment in accordance with an approved closure plan may be conducted at any time before or after notification of closure. Notification of the structural assessment (assessment), as described in Section 5.2 of this closure plan, shall occur at the same time as notification of closure (*see* Permit Section 9.4.6.2).

Within 90 days after the final receipt of waste, the permitted unit will be emptied of all stored waste. Within ten days of completing hazardous waste removal or within 100 days of the final receipt of hazardous waste, whichever comes first, the Permittees will complete the records review (review) and assessment and submit an amended closure plan, if necessary, to the Department for review and approval as a permit modification in accordance with Permit Section 9.4.8. Upon approval of the modified closure plan, if applicable, the Permittees will decontaminate unit surfaces and related equipment.

Soil sampling and decontamination verification sampling activities will be conducted to demonstrate that soils, structures, surfaces, and related equipment at the permitted unit meet the closure performance standards in Permit Section 9.2.

All closure activities, including submittal of a final closure certification report to the Department for review and approval, will be completed within 180 days after the final receipt of waste. In the event that closure of the permitted unit cannot proceed according to schedule, the Facility will notify the Department in accordance with the extension request requirements in Permit Section 9.4.1.1.

## 5.0 CLOSURE PROCEDURES

Closure activities at the permitted unit will include: removal of hazardous wastes; proper management and disposal of hazardous waste residues and contaminated equipment associated with the permitted unit; verification that the closure performance standards have been achieved; and submittal of a final closure certification report. The following sections describe closure activities applicable to the permitted unit.

### 5.1 Removal of Waste

In accordance with Permit Section 9.4.2, all stored hazardous wastes will be removed from the permitted unit scheduled for closure. Depending upon their size, containers will be removed with forklifts, container dollies, air pallets, or manually. Containers will be placed on flat bed trucks, trailers, or other appropriate vehicles for transport. Appropriate shipping documentation will accompany the wastes during transport. Containers holding hazardous wastes will be moved to a permitted on-site storage unit or a permitted off-site treatment, storage, or disposal facility.

### 5.2 Records Review and Structural Assessment

After waste removal and before starting closure decontamination and sampling activities, the Facility Operating and Inspection Records for the permitted unit will be reviewed and a structural assessment will



be conducted to determine any previous finding(s) or action(s) that may influence closure activities or potential sampling locations.

### **5.2.1 Records Review**

The Facility Operating and Inspection Records shall be reviewed as outlined in Permit Section 9.4.6.1. The goals of the review will be to:

- a. confirm the specific hazardous waste constituents of concern; and
- b. confirm additional sampling locations (*e.g.*, locations of spills or chronic conditions identified in the Operating and Inspection Records).

### **5.2.2 Structural Assessment**

An assessment of the permitted unit's physical condition will be conducted in accordance with Permit Section 9.4.6.2. The assessment will include inspecting the asphalt pad and the loading dock for any existing cracks or conditions that indicate a potential for, or an actual, release of constituents. If a crack, gap, or stained area is present, the Permittees will amend this closure plan in order to update the sampling and analysis plan (SAP) (*see* Section 6.0 of this closure plan) to add these sampling locations and the applicable sampling methods and procedures. This inspection will be documented with photographs and drawings, as necessary.

## **5.3 Decontamination and Removal of Structures and Equipment**

In accordance with the procedures in Permit Section 9.4.3, all remaining hazardous waste residues and hazardous constituents will be removed from the permitted unit. The permitted unit's structures and related equipment will be decontaminated, removed, or both and managed appropriately. All waste material will be controlled, handled, characterized, and disposed of in accordance with Permit Attachment C (*Waste Analysis Plan*), Permit Section 9.4.5, and Facility waste management procedures (*see* Table G.17-3). Decontamination activities will ensure the removal of all hazardous waste residues and hazardous waste constituents from the permitted unit to meet the closure performance standards as outlined in Permit Section 9.2.

### **5.3.1 Removal of Structures and Related Equipment**

All surfaces, structures, and related equipment that are removed will not require decontamination, will be considered solid and potentially hazardous waste (as defined by this Permit) when removed, and will be disposed of in accordance with Permit Section 9.4.5 and Section 7.0 of this closure plan.

At this time, there is no equipment identified for removal from the unit; however, if equipment is identified during the assessment, it will be removed and disposed of in accordance with Permit Section 9.4.3.2. The asphalt pad, the materials associated with the asphalt pad (*e.g.*, the berm around the pad), and a minimum of six inches of the base course and soil underlying the asphalt pad shall be removed after the assessment. If after the removal of the pad (and underlying soil and base course material) the remaining surface shows evidence that the removal to that point has not gathered all appropriate soils and materials associated with the pad, additional soil and materials will be removed. The Permittees shall take precautions to not remove or disturb the soil or tuff that overlies the regulated unit (covered under the March 1, 2005 Compliance Order on Consent (*see* Permit Section 9.3)) beneath the permitted unit. The option of removing small areas of asphalt at sampling locations where contamination is suspected (*i.e.*,

locations of spills or stains) to allow sampling without disturbing the surrounding area prior to the general removal of the pad will be assessed at the time of the assessment.

### **5.3.2 Decontamination of Structures and Related Equipment**

All structures and related equipment that will be reused by the Facility will be decontaminated in accordance with Permit Section 9.4.3.1. The following structures and equipment located at the permitted unit is expected to be left in place and will therefore be decontaminated: the loading dock and the metal awning.

Water-resistant structures and equipment (*i.e.*, the loading dock, the awning) at the permitted unit and not sensitive to water intrusion will be decontaminated by steam cleaning, or pressure washing, with a solution consisting of a surfactant detergent (*e.g.*, Alconox®) and water and mixed in accordance with the manufacturer's recommendation. All other equipment at the permitted unit that is sensitive to water intrusion (*e.g.*, electronic devices or tools) will be decontaminated by washing using a wipe-down method with a solution consisting of a surfactant detergent (*e.g.*, Alconox®) and water and mixed in accordance with the manufacturer's recommendation.

The quantity of the wash solution will be minimized by dispensing from buckets, spray bottles, or other types of containers. Cloths, or other absorbent cleaning devices, will not be reused to wipe down the equipment after being wetted in the wash solution or after spraying solution onto the equipment. Portable berms or other such devices (*e.g.*, absorbent socks, plastic sheeting, wading pools, existing secondary containment) will collect excess water and provide containment during the decontamination process.

### **5.4 Equipment Used During Decontamination Activities**

Reusable protective clothing, tools, and equipment used during decontamination activities will be cleaned with a wash water solution. Residue, disposable equipment, and small reusable equipment that cannot be decontaminated will be containerized and managed as waste as summarized in Table G.17-3 and in accordance with Facility waste management procedures, depending on the regulated constituents present.

## **6.0 SAMPLING AND ANALYSIS PLAN**

This SAP addresses the specific requirements in Permit Section 9.4.7 and describes the sampling, analysis, and quality assurance/quality control (QA/QC) methods that will be used to demonstrate that the Permittees have met the closure performance standards outlined in Permit Section 9.2.

### **6.1 Soil Sampling and Decontamination Verification Wipe Sampling Activities**

Soil sampling and decontamination verification wipe sampling activities will be conducted at the permitted unit in order to verify that the soils beneath the permitted unit as well as the unit's surfaces and related equipment meet the closure performance standards in Permit Section 9.2. All samples will be collected and analyzed in accordance with the procedures in Sections 6.2, 6.3, and 6.4 of this closure plan.

One wipe sample will be collected from each piece of decontaminated equipment related to the permitted unit (*e.g.*, the awning). In compliance with Permit Section 9.4.7.1.i, this closure plan will ensure the collection of wipe samples from the floor and walls of the loading dock for a total of four verification samples.

In compliance with Permit Section 9.4.7.1.ii, this closure plan will ensure the collection of soil samples from the permitted unit at the following locations:

- a. one sample from a known past loading zone area ('sample location 1') identified in the permitted unit's records (*see* Permit Section 9.4.7.1.ii(1));
- b. one sample every 900 square feet of the permitted unit for a total of 46 samples (*see* Permit Section 9.4.7.1.ii(2));
- c. two samples from the swale in the eastern portion of the permitted unit (*see* Permit Section 9.4.7.1.ii(3)); and
- d. one sample every 30 feet along the drain line on the northern boundary of the permitted unit for a total of four samples (*see* Permit Section 9.4.7.1.ii(8)).

Figure G.17-1 illustrates the sampling locations discussed in this section.

## **6.2 Sample Collection Procedures**

Samples will be collected in accordance with the Permit Section 9.4.7.1 and the procedures identified in this SAP which incorporate guidance from the United States Environmental Protection Agency (USEPA) (EPA, 2002), DOE (DOE, 1995), and other Department-approved procedures.

### **6.2.1 Wipe Sampling**

Surface wipe samples will be collected and analyzed to determine if residual to determine if residual hazardous constituents remain on the surfaces and related equipment at the permitted unit. Samples will be collected in accordance with the National Institute of Occupational Safety and Health (NIOSH) *Manual of Analytical Methods* (NIOSH, 1994). The appropriate wipe sample method will consider the type of surface being sampled, the type of constituent being sampled for, the solution used, and the desired constituent concentration detection limit.

The NIOSH method includes wiping a 100 square centimeter area at each discrete location with a gauze wipe wetted with a liquid solution appropriate for the desired analysis (*e.g.*, deionized water for lead). For wipe sampling, guidance from the analytical laboratory must be obtained prior to wipe verification sampling to confirm that the solution chosen for each analysis is appropriate for the analysis to be conducted and that wipe sampling is a proper technique for the analysis.

### **6.2.2 Soil Sampling**

Soil samples will be collected and analyzed to determine if hazardous constituents are present in soils at the permitted unit. Soil samples will be collected using a spade, scoop, auger, trowel, or other equipment as specified in approved methods for the type of analytes (*i.e.*, EPA 1996 or 2002) and from the appropriate depths as directed in Permit Section 9.4.7.1.ii. Samples will be kept at their at-depth temperature or lower, protected from ultraviolet light, sealed tightly in the recommended container, and analyzed within the specific holding times listed in Table G.10-5.

### **6.2.3 Cleaning of Sampling Equipment**

Reusable sampling equipment will be cleaned and rinsed prior to use. Sampling equipment rinsate blanks will be collected and analyzed only if reusable sampling equipment is used. Reusable decontamination

equipment, including protective clothing and tools, used during closure activities will be scrapped as necessary to remove residue and cleaned with a wash water solution. Sampling equipment will be cleaned prior to each use with a wash solution, rinsed several times with tap water, and air-dried to prevent cross-contamination of samples. A disposable sampler is considered clean if still in a factory-sealed wrapper.

### **6.3 Sample Management Procedures**

The following sections provide a description of sample documentation, handling, preservation, storage, packaging, and transportation requirements that will be followed during the sampling activities associated with the closure.

#### **6.3.1 Sample Documentation**

Sampling personnel will complete and maintain records to document sampling and analysis activities. Sample documentation will include sample identification numbers, chain-of-custody forms, analysis requested, sample logbooks detailing sample collection activities, and shipping forms (if necessary).

##### **6.3.1.1 Chain-of-Custody**

Chain-of-custody forms will be maintained by sampling personnel until the samples are relinquished to the analytical laboratory. This will ensure the integrity of the samples and provide for an accurate and defensible written record of the sampling possession and handling from the time of collection until laboratory analysis. One chain-of-custody form may be used to document all of the samples collected from a single sampling event. The sample collector will be responsible for the integrity of the samples collected until properly transferred to another person. The EPA considers a sample to be in a person's custody if it is:

- a. in a person's physical possession;
- b. in view of the person in possession; or
- c. secured by that person in a restricted access area to prevent tampering.

The sample collector will document all pertinent sample collection data. Individuals relinquishing or receiving custody of the samples will sign, date, and note the time on the analysis request and chain-of-custody form. A chain-of-custody form must accompany all samples from collection through laboratory analysis. The analytical laboratory will return the completed chain-of-custody form to the Facility and it will become part of the permanent sampling record documenting the sampling efforts.

##### **6.3.1.2 Sample Labels and Custody Seals**

A sample label will be affixed to each sample container. The sample label will include the following information:

- a. a unique sample identification number;
- b. name of the sample collector;
- c. date and time of collection;

- d. type of preservatives used, if any; and
- e. location from which the sample was collected.

A custody seal will be placed on each sample container to detect unauthorized tampering with the samples. These labels must be initialed, dated, and affixed by the sample collector in such a manner that it is necessary to break the seal to open the container.

### **6.3.1.3 Sample Logbook**

All pertinent information on the sampling effort must be recorded in a bound logbook. Information must be recorded in ink and any cross-outs must be made with a single line with the change initialed and dated by the author. The sample logbook will include the following information:

- a. the sample location;
- b. suspected composition;
- c. sample identification number;
- d. volume/mass of sample taken;
- e. purpose of sampling;
- f. description of sample point and sampling methodology;
- g. date and time of collection;
- h. name of the sample collector;
- i. sample destination and how it will be transported;
- j. observations; and
- k. name(s) of personnel responsible for the observations.

### **6.3.2 Sample Handling, Preservation, and Storage**

Samples will be collected and containerized in appropriate pre-cleaned sample containers. Table G.17-5 presents the requirements in *SW-846* (EPA, 1986) for sample containers, preservation techniques, and holding times. Samples that require cooling to 4 degrees Celsius will be placed in a cooler with ice or ice gel or in a refrigerator immediately upon collection.

### **6.3.3 Packaging and Transportation of Samples**

All packaging and transportation activities will meet safety expectations, QA requirements, DOE Orders, and relevant local, state, and federal laws (including 10 CFR and 49 CFR). Appropriate Facility documents establish the requirements for packaging design, testing, acquisition, acceptance, use, maintenance, and decommissioning and for on-site, intra-site, and off-site shipment preparation and transportation of general commodities, hazardous materials, substances, waste, and defense program materials.

Off-site transportation of samples will occur via private, contract, or common motor carrier, air carrier, or freight. All off-site transportation will be processed through the Facility packaging and transportation organization, unless the shipper is specifically authorized through formal documentation by that organization to independently tender shipments to common motor or air carriers.

## **6.4 Sample Analysis Requirements**

Samples will be analyzed for all hazardous constituents listed in Appendix VIII of 40 CFR Part 261 and in Appendix IX of 40 CFR Part 264 that have been managed at the permitted unit over its operational history (*see* Table G.17-1). Table G.17-1 will be modified, as necessary, to incorporate changes as a result of the permitted unit's records review. Samples will be analyzed by an independent laboratory using the methods outlined in Table G.17-4. Analytes, test methods and instrumentation, target detection limits, and rationale for metals and organic analyses are presented in Table G.17-4. If any of the information from these tables has changed at the time of closure, the Permittees will amend this closure plan to update all methods in this SAP.

### **6.4.1 Analytical Laboratory Requirements**

The analytical laboratory will perform the detailed qualitative and quantitative chemical analyses specified in Section 6.4.2. The analytical laboratory will have:

- a. a documented comprehensive QA/QC program;
- b. technical analytical expertise;
- c. a document control and records management plan; and
- d. the capability to perform data reduction, validation, and reporting.

The selection of the analytical testing methods identified in Table G.17-4 is based on the following considerations:

- e. constituents of concern;
- f. the physical form of the waste;
- g. constituents of concern;
- h. required detection limits (*e.g.*, regulatory thresholds); and
- i. information requirements (*e.g.*, waste classification).

### **6.4.2 Quality Assurance/Quality Control**

All sampling and analysis will be conducted in accordance with QA/QC procedures defined by the latest revision of "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (SW-846) (EPA, 1986) or other Department-approved procedures. Field sampling procedures and laboratory analyses will be evaluated through the use of QA/QC samples to assess the overall quality of the data produced. QC samples evaluate precision, accuracy, and potential sample contaminations associated with the sampling and analysis process, and are described in the following sections, along with information on calculations necessary to evaluate the QC results.

### **6.4.2.1 Field Quality Control**

The field QC samples that will be collected are trip blanks, field blanks, field duplicates, and equipment rinsate blanks. Table G.17-6 presents a summary of QC sample types, applicable analyses, frequency, and acceptance criteria. QC samples will be given a unique sample identification number and submitted to the analytical laboratory as blind samples. QC samples will be identified on the applicable forms so that the results can be applied to the associated sample.

### **6.4.2.2 Analytical Laboratory QC Samples**

QA/QC considerations are an integral part of analytical laboratory operations. Laboratory QA ensures that analytical methods generate data that are technically sound, statistically valid, and that can be documented. QC procedures are the tools employed to measure the degree to which these QA objectives are met.

### **6.4.3 Data Reduction, Verification, Validation, and Reporting**

Analytical data generated by the activities described in this closure plan will be verified and validated. Data reduction is the conversion of raw data to reportable units; transfer of data between recording media, and computation of summary statistics, standard errors, confidence intervals, and statistical tests.

### **6.4.4 Data Reporting Requirements**

Analytical results will include all pertinent information about the condition and appearance of the sample-as-received. Analytical reports will include:

- a. a summary of analytical results for each sample;
- b. results from QC samples such as blanks, spikes, and calibrations;
- c. reference to standard methods or a detailed description of analytical procedures; and
- d. raw data printouts for comparison with summaries.

The laboratory will describe the analysis in sufficient detail so that the data user can understand how the sample was analyzed.

## **7.0 WASTE MANAGEMENT**

All waste generated during closure will be controlled, handled, characterized, and disposed of in accordance Permit Section 9.4.5, Permit Attachment C (*Waste Analysis Plan*), and Facility waste management procedures. Closure activities may generate different types of waste materials: these wastes are listed with potential disposal options in Table G.17-3 of this closure plan. Subsequent disposition options for the decontaminated structures and equipment include reuse, recycling, or disposal. Reusable protective clothing, tools, and equipment used during decontamination will be cleaned with a wash water solution. Disposable equipment and small reusable equipment that cannot be decontaminated, as summarized in Table G.17-3, will be containerized and managed as waste.

## 8.0 CLOSURE CERTIFICATION REPORT

Upon completion of the closure activities at the permitted unit, a closure certification report will be prepared and submitted to the Department for review and approval in accordance with Permit Section 9.5.

## 9.0 REFERENCES

DOE, 1995. "DOE Methods for Evaluating Environmental and Waste Management Samples," DOE/EM-0089T, Rev. 2. Prepared for the U.S. Department of Energy by Pacific Northwest Laboratory, Richland, Washington.

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**Table G.17-1**

**Hazardous Waste Constituents of Concern at the Technical Area 54, Area G, West Outdoor  
 Container Storage Unit<sup>a</sup>**

| Category          | EPA Hazardous Waste Numbers  | Specific Constituents   |
|-------------------|--|---|
| Toxic Metals      | D003, D004, D005, D006, D007, D008, D009, D010, D011   | Arsenic, Barium, Cadmium, Chromium, Lead, Mercury, Selenium, Silver   |
| Organic Compounds | D018, D019, D021, D022, D026, D027, D028, D029, D030, D035, D036, D037, D038, D039, D040, D043<br><br>F001, F002, F003, F004, F005 | Benzene, Carbon tetrachloride, Chlorobenzene, Chloroform, Cresol, 1,4-Dichlorobenzene, 1,2-Dichloroethylene, 2,4-Dinitrotoluene, Methyl ethyl ketone, Nitrobenzene, Pentachlorophenol, Pyridine, Tetrachloroethylene, Trichloroethylene, Vinyl Chloride<br><br>Acetone, Methyl ethyl ketone, , Methylene Chloride, Toluene, MIBK, DBCP, Tetrachloroethylene, 1,1,1-trichloroethane, Chlorinated Fluorocarbons, 1,1,2- trichloro-1,1,2-trifluoroethane, ortho-dichlorobenzene, Trichlorofluoromethane, 1,1,2-trichloroethane, Xylene, Ethyl acetate, Ethyl benzene, Ethyl ether, n-butyl alcohol, Cyclohexanone, Methanol, Cresols, Cresylic acid, Nitrobenzene, Carbon disulfide, Isobutanol, Pyridine, 2-ethoxyethanol, 2-nitropropane |

<sup>a</sup> Based on the unit Operating Record

MIBK = methyl isobutyl ketone or 4-methyl-2-pentanone

DBCP = 1,2-dibromo-3-chloropropane

**Table G.17-2**

**Closure Schedule for Technical Area 54, Area G, West Outdoor Container Storage Unit**

| <b>Activity</b>  | <b>Maximum Time Required</b>   |
|--|--|
| Notify the Department of intent to close and conduct structural assessment.                      | -45 Days   |
| Final receipt of waste.  | Day 0  |
| Complete waste removal.  | Day 90   |
| Complete records review and structural assessment.   | 10 days after completed waste removal or 100 days after final receipt of waste |
| Complete all closure activities and submit final closure certification report to the Department. | Day 180  |

**Table G.17-3**  
**Potential Waste Materials, Waste Types, and Disposal Options**

| Potential Waste Materials           | Waste Types                       | Disposal Options   |
|-------------------------------------|-----------------------------------|--|
| Personal protective equipment (PPE) | Non-regulated solid waste         | Subtitle D landfill  |
|                                     | Hazardous waste                   | The PPE will be treated to meet Land Disposal Restriction (LDR) treatment standards, if necessary, and disposed in a Subtitle C or D landfill, as appropriate.                             |
|                                     | Low-level radioactive solid waste | Either an authorized on-site radioactive waste disposal area that is not undergoing closure under RCRA or its state analog, or an authorized off-site radioactive waste disposal facility. |
|                                     | Mixed waste                       | Waste will be treated to meet LDR treatment standards, if necessary, and disposed in a Subtitle C or D landfill or the Waste Isolation Pilot Plant (WIPP), as appropriate.                 |
| Decontamination wash water          | Non-regulated liquid waste        | Sanitary sewer   |
|                                     | Hazardous waste                   | Waste will be treated to meet LDR treatment standards, if necessary, and disposed in a Subtitle C or D landfill, as appropriate.   |
|                                     | Radioactive liquid waste          | Radioactive Liquid Waste Treatment Facility (RLWTF)  |
|                                     | Mixed waste                       | Waste will be treated to meet LDR treatment standards, if necessary, and disposed in a Subtitle C or D landfill or WIPP, as appropriate.   |
| Metal                               | Non-regulated solid waste         | Subtitle D landfill or recycled  |
|                                     | Hazardous waste                   | Waste will be treated to meet LDR treatment standards, if necessary, and disposed in a Subtitle C or D landfill, as appropriate.   |
|                                     | Low-level radioactive solid waste | Either an authorized on-site radioactive waste disposal area that is not undergoing closure under RCRA or its state analog, or an authorized off-site radioactive waste disposal facility. |

| Potential Waste Materials            | Waste Types                       | Disposal Options   |
|--------------------------------------|-----------------------------------|--|
|                                      | Mixed waste                       | Waste will be treated to meet LDR treatment standards, if necessary, and disposed in a Subtitle C or D landfill, or WIPP, as appropriate.  |
| Discarded waste management equipment | Non-regulated solid waste         | Subtitle D landfill  |
|                                      | Hazardous waste                   | Waste will be treated to meet LDR treatment standards, if necessary, and disposed in a Subtitle C or D landfill, as appropriate.   |
|                                      | Low-level radioactive solid waste | Either an authorized on-site radioactive waste disposal area that is not undergoing closure under RCRA or its state analog, or an authorized off-site radioactive waste disposal facility. |
|                                      | Mixed waste                       | Waste will be treated to meet LDR treatment standards, if necessary, and disposed in a Subtitle C or D landfill or WIPP, as appropriate.   |
| Sampling equipment                   | Non-regulated solid waste         | Subtitle D landfill  |
|                                      | Hazardous waste                   | Waste will be treated to meet LDR treatment standards, if necessary, and disposed in a Subtitle C or D landfill, as appropriate.   |
|                                      | Low-level radioactive solid waste | Either an authorized on-site radioactive waste disposal area that is not undergoing closure under RCRA or its state analog, or an authorized off-site radioactive waste disposal facility. |
|                                      | Mixed waste                       | Waste will be treated to meet LDR treatment standards, if necessary, and disposed in a Subtitle C or D landfill or WIPP, as appropriate.   |
| Asphalt                              | Non-regulated solid waste         | Subtitle D landfill or potentially, as included in corrective action activities at Area G.   |
|                                      | Hazardous waste                   | Waste will be treated to meet LDR treatment standards, if necessary, and disposed in a Subtitle C or D landfill, as appropriate.   |
|                                      | Low-level radioactive solid       | Either an authorized on-site radioactive waste   |

| Potential Waste Materials | Waste Types | Disposal Options  |
|---------------------------|-------------|---|
|                           | waste       | disposal area that is not undergoing closure under RCRA or its state analog, or an authorized off-site radioactive waste disposal facility. |
|                           | Mixed waste | Waste will be treated to meet LDR treatment standards, if necessary, and disposed in a Subtitle C or D landfill or WIPP, as appropriate.    |
|                           |             |   |

**Table G.17-4**  
**Summary of Analytical Methods**

| Analyte   | EPA SW-846 Analytical Method <sup>a</sup> | Test Methods/ Instrumentation | Target Detection Limit <sup>b</sup> | Rationale  |
|---|---|-------------------------------|-------------------------------------|--|
| <i>Metal Analysis</i>   |   |                               |                                     |  |
| Barium  | 6010, 7010                                | ICP-AES, GFAA                 | 200 ug/L                            | Determine the metals concentration in the samples. |
| Cadmium   | 6010, 7010                                | ICP-AES, GFAA                 | 2 ug/L                              |  |
| Chromium  | 6010, 7010                                | ICP-AES, GFAA                 | 10 ug/L                             |  |
| Lead  | 6010, 7010                                | ICP-AES, GFAA                 | 5 ug/L                              |  |
| Mercury   | 6010, 7470A, 7471B                        | ICP-AES, CVAA                 | 0.2 ug/L                            |  |
| <i>Organic Analysis</i>   |   |                               |                                     |  |
| Target compound list VOCs plus ten tentatively identified compounds (TIC) | 8260B                                     | GC/MS                         | 10 mg/L                             | Determine the VOCs concentration in the samples.   |

<sup>a</sup> U.S. Environmental Protection Agency (EPA), 1986 and all approved updates, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846.

<sup>b</sup> Detection limits listed for metals are for clean water. Detection limits for organics are expressed as practical quantitation limits. Actual detection limits may be higher depending on sample composition and matrix type.

CVAA = Cold-vapor atomic absorption spectroscopy

GC/MS = Gas chromatography/mass spectrometry

GFAA = Graphite furnace atomic absorption spectroscopy

ICP-AES = Inductively coupled plasma-atomic emission spectrometry

mg/L = milligrams per liter

ug/L = micrograms per liter.

**Table G.17-5**  
**Sample Containers<sup>a</sup>, Preservation Techniques, and Holding Times<sup>b</sup>**

| Analyte Class and Sample Type                            | Container Type and Materials   | Preservation  | Holding Time |
|--|--|---|--------------|
| <i>Metals</i>  |  |   |              |
| TCLP/Total Metals:<br>Barium, Cadmium,<br>Chromium, Lead | Aqueous Media:<br>500-mL Wide Mouth-Polyethylene or<br>Glass with Teflon Liner         | Aqueous Media:<br>HNO <sub>3</sub> to pH <2<br>Cool to 4 °C   | 180 Days     |
|  | Solid Media:<br>125-mL Glass   | Solid Media:<br>Cool to 4 °C  |              |
| TCLP/Total Mercury                                       | Aqueous Media:<br>500-mL Wide Mouth-Polyethylene or<br>Glass with Teflon Liner         | Aqueous Media:<br>HNO <sub>3</sub> to pH <2<br>Cool to 4 °C   | 28 Days      |
|  | Solid Media:<br>125-mL Glass   | Solid Media:<br>Cool to 4 °C  |              |
| <i>Volatile Organic Compounds</i>                        |  |   |              |
| Target Compound<br>Volatile Organic<br>Compounds         | Aqueous Media:<br>Two 40-mL Amber Glass Vials with<br>Teflon-Lined Septa               | Aqueous Media:<br>HCl to pH<2<br>Cool to 4 °C   | 14 days      |
|  | Solid Media:<br>125-mL Glass or Two 40-mL Amber Glass<br>Vials with Teflon-Lined Septa | Solid Media<br>Cool to 4 °C<br>Add 5 mL Methanol or Other<br>Water Miscible Organic<br>Solvent to 40-mL Glass Vials |              |

<sup>a</sup> Smaller sample containers may be required due to health and safety concerns associated with potential radiation exposure, transportation requirements, and waste management considerations.

<sup>b</sup> Information obtained from “Test Methods for Evaluating Solid Waste, Physical/Chemical Methods,” SW-846, U.S. Environmental Protection Agency, 1986 and all approved updates.

°C = degrees Celsius

HNO<sub>3</sub> = nitric acid

HCl = hydrochloric acid

mL = milliter

TCLP = Toxicity Characteristic Leaching Procedure

**Table G.17-6**

**Quality Control Sample Types, Applicable Analyses, Frequency, and Acceptance Criteria**

| <b>QC Sample Type</b>                | <b>Applicable Analysis<sup>a</sup></b> | <b>Frequency</b>   | <b>Acceptance Criteria</b>                                   |
|--------------------------------------|--|--|--|
| Trip Blank                           | VOC                                    | One set per shipping cooler containing samples to be analyzed for VOCs | Not Applicable   |
| Field Blank                          | VOC, metals                            | One sample daily per analysis  | Not Applicable   |
| Field Duplicate                      | Chemical                               | One for each sampling sequence   | Relative percent difference less than or equal to 20 percent |
| Equipment Rinsate Blank <sup>b</sup> | VOC, metals                            | One sample daily   | Not Applicable   |

<sup>a</sup> For VOC analysis, if blank shows detectable levels of any common laboratory contaminant (*e.g.*, methylene chloride, acetone, 2-butanone, toluene, and/or any phthalate ester), sample must exhibit that contaminant at a level 10 times the quantitation limit to be considered detectable. For all other contaminants, sample must exhibit the contaminant at a level 5 times the quantitation level to be considered detectable.

<sup>b</sup> Collected only if reusable sampling equipment used.



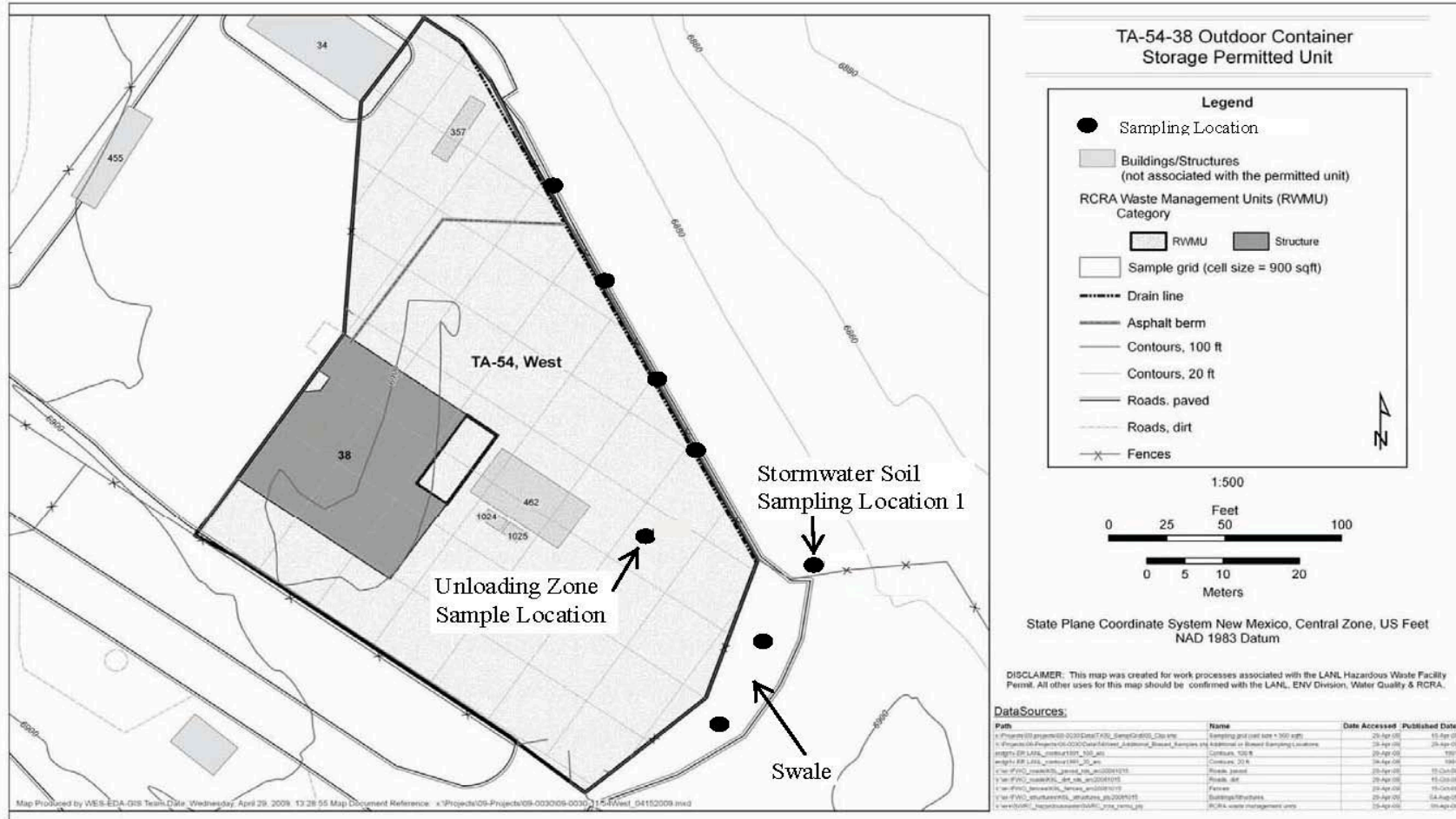


Figure G.17-1: Technical Area 54 West Outdoor Container Storage Unit Grid Sampling and Additional Sampling Locations