# ATTACHMENT G.10
# TECHNICAL AREA 54, AREA G, PAD 9
# OUTDOOR CONTAINER STORAGE UNIT
# CLOSURE PLAN

DRAFT

**TABLE OF CONTENTS**

LIST OF TABLES ..... 3

LIST OF FIGURES ..... 4

1.0 INTRODUCTION ..... 6
2.0 DESCRIPTION OF UNIT TO BE CLOSED ..... 6
2.1 Permitted Unit Domes ..... 6
2.1.1 Domes 229, 231, and 232 Fire Water Collection System ..... 7
2.1.2 Dome 230 Secondary Containment ..... 7
3.0 ESTIMATE OF MAXIMUM WASTE STORED ..... 7
4.0 GENERAL CLOSURE REQUIREMENTS ..... 7
4.1 Closure Performance Standard ..... 7
4.2 Closure Schedule ..... 8
5.0 CLOSURE PROCEDURES ..... 9
5.1 Removal of Waste ..... 9
5.2 Records Review and Structural Assessment ..... 9
5.2.1 Records Review ..... 9
5.2.2 Structural Assessment ..... 9
5.3 Decontamination and Removal of Structures and Related Equipment ..... 10
5.3.1 Removal of Structures and Related Equipment ..... 10
5.3.2 Decontamination of Equipment ..... 10
5.4 Equipment Used During Decontamination Activities ..... 11
6.0 SAMPLING AND ANALYSIS PLAN ..... 11
6.1 Decontamination Verification ..... 11
6.2 Sample Collection Procedures ..... 12
6.2.1 Liquid Sampling ..... 12
6.2.2 Wipe Sampling ..... 12
6.2.3 Soil Sampling ..... 12
6.2.4 Cleaning of Sampling Equipment ..... 13
6.3 Sample Management Procedures ..... 13
6.3.1 Sample Documentation ..... 13
6.3.2 Sample Handling, Preservation, and Storage ..... 14
6.3.3 Packaging and Transportation of Samples ..... 15
6.4 Sample Analysis Requirements ..... 15
6.4.1 Analytical Laboratory Requirements ..... 15
6.4.2 Quality Assurance/Quality Control ..... 16
6.4.3 Data Reduction, Verification, Validation, and Reporting ..... 16

DRAFT

6.4.4 Data Reporting Requirements ..... 16
7.0 WASTE MANAGEMENT ..... 16
8.0 CLOSURE CERTIFICATION REPORT ..... 17
9.0 REFERENCES ..... 17

DRAFT

## LIST OF TABLES


| TABLE NO. | TITLE |
|---|---|
| G.10-1 | Closure Schedule for the Technical Area 54, Area G, Pad 9 Outdoor Container Storage Unit |
| G.10-2 | Potential Waste Materials, Waste Types, and Disposal Options |
| G.10-3 | Summary of Analytical Methods |
| G.10-4 | Sample Containers, Preservation Techniques, and Holding Times |
| G.10-5 | Quality Control Sample Types, Applicable Analyses, Frequency, and Acceptance Criteria |
| G.10-6 | List of Equipment at the Technical Area 54, Area G, Pad 9 Outdoor Container Storage Unit |


DRAFT

## LIST OF FIGURES

| FIGURE NO. | TITLE |
|---|---|
| G.10-1 | Technical Area 54, Area G, Pad 9 Outdoor Container Storage Unit Grid Sampling and Additional Sampling Locations |

DRAFT

## 1.0 INTRODUCTION

This closure plan describes the activities necessary to close the outdoor hazardous waste container storage unit at Technical Area (TA)-54, Area G, Pad 9 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 operated 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 to the plan, 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 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 comprised of an asphalt pad which is located in the eastern end of Area G. It was constructed in 1993, consists of a four to six inch layer of asphalt over the underlying base course overlying fill (minimum six inches of tuff), and measures 570 feet long and 275 feet wide, or approximately 158,000 square feet. It is constructed with curbing on the west and east sides and is sloped from 1% to 1.5% to the east and south-east for drainage. Rainwater flow is directed across the pad by the eastward slope and through small PVC drains spaced at 55 foot intervals in the curbing along the east side of the pad. The slope below the curbing is protected with rock and concrete. Concrete curbing also extends along the west and partially the south sides of the pad and ends at a concrete and rock drainage structure. The remainder of the south side of the pad is uncurbed. Four domes (Domes 229, 230, 231, 232), one transportainer (362), and two storage sheds (484 & 574) are situated on it (*see* Figure G.10-1).

The permitted unit has stored the following waste types: solidified inorganic solids; leached process residues; salts and cement paste; ash; dewatered aqueous sludge; chemical treatment sludge; soils; combustible debris (*e.g.*, plastics, rubber, laboratory trash, building debris); and heterogeneous debris. 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 regarding waste management procedures and hazardous waste constituents stored at the permitted unit.

### 2.1 Permitted Unit Domes

The four storage domes and the transportainer (362) at the permitted unit have been used for the storage of hazardous waste in both liquid and solid form since 1994. The domes (an aluminum framework of trusses covered with tension-fitted ultraviolet resistant, fire-retardant coated, polyester fabric) are 246 feet long by 89 feet wide and cover a surface area of approximately 20,400 square feet each. The base of each dome is secured with anchor bolts to a concrete ring wall that surrounds the interior floor perimeter and provides run-on and run-off protection. The ring wall is designed to retain any liquids that may

accumulate within the domes. Each dome has several personnel doors around the perimeter of the dome and a larger vehicle access door and ramp on the west end.

Dome 231 contains a Perma-Con® modular panel containment structure (68 feet long x 28 feet wide) used for the remediation of transuranic waste prior to shipment to the Waste Isolation Pilot Plant. Domes 229 and 232 have been used only for the storage of non-liquid hazardous waste and Dome 230 and 231 have been used for the storage of both liquid and non-liquid hazardous waste.

### 2.1.1 Domes 229, 231, and 232 Fire Water Collection System

The permitted unit has a fire water collection system that collects water from Domes 232, 231, and Dome 226 on Pad 1. The system was designed to provide an augmented fire water collection capability to limit run-off of fire suppression waters from the domes if the volume of water during a fire exceeded their collection capacity. Fire suppression water from the domes is collected via a pipeline that runs from Pad 1 and down the east side of the permitted unit below the asphalt. The pipeline is sloped to provide gravity flow. The southeast portions of Domes 231 and 232 have three drain inlets each and Dome 226 has two drain inlets on the south end that connect to this pipeline. The pipeline terminates in the concrete walled semi-circular collection sump (lined with high density polyethylene plastic) in the east end of Dome 229. The semi-circular sump, which measures 70 feet by 28 feet and 26 inches in depth, is not intended for secondary containment of liquid waste and has not been used as such based on review of the permitted unit's Operating Record.

### 2.1.2 Dome 230 Secondary Containment

Dome 230 has a concrete walled semi-circular sump (lined with high density polyethylene plastic) at the east end of the dome and double high density polyethylene layers under the pad that act as secondary containment for liquid waste. The design of the sump is similar to that of Dome 229 as described above except that the sump in Dome 230 is not connected to an external drain system. The maximum capacity of accumulated liquids within the concrete sump and the curbed area of the dome are approximately 48,000 gallons.

## 3.0 ESTIMATE OF MAXIMUM WASTE STORED

Approximately 6,400,000 gallons of hazardous waste has been stored at the permitted unit to date. Throughout the life of this Permit, it is estimated that an additional 9,000,000 gallons of hazardous waste will be stored.

## 4.0 GENERAL CLOSURE REQUIREMENTS

### 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;

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;

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. 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;

e. minimize the need for further maintenance;

f. 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

g. comply with the closure requirements of Permit Part 9 (*Closure*) and 40 CFR Part 264 Subparts G and I.

Closure of the permitted unit will be deemed complete when: 1) all structures and related 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.10-1 of 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 begin according to the 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 in accordance with Permit Section 9.4.6.2.

Within 90 days after the final receipt of hazardous 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, 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 structures and related equipment.

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

DRAFT

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 Permittees 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 in Permit Section 9.2 have been achieved; and submittal of a final closure certification report. The following sections describe the procedures to be used for closure of the permitted unit.

### 5.1 Removal of Waste

In accordance with Permit Section 9.4.2, all stored hazardous waste 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 from the permitted unit. Appropriate shipping documentation will be prepared for the wastes during transport. Containers holding hazardous waste 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 an assessment will be conducted to determine any finding(s) or action(s) that may influence closure activities or additional sampling locations.

#### 5.2.1 Records Review

The Facility Operating and Inspection Records shall be reviewed in accordance with 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 any 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 floors, walls, and ceilings in the transportainer and the PermaCon®, as well as inspecting the asphalt pad, 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 applicable sampling procedures. This inspection will be documented with photographs and drawings, as necessary.

## 5.3 Decontamination and Removal of Structures and Related 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. Decontamination activities will ensure the removal of all hazardous waste residues and hazardous constituents from the permitted unit to meet the closure performance standards outlined in Permit Section 9.2.

### 5.3.1 Removal of Structures and Related Equipment

All 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.

The two storage sheds, the PermaCon®, and the tensioned-fabric membranes on the domes (as well as the aluminum beams, trusses, and ancillary equipment supporting the domes) will be removed before the assessment. The asphalt pad, the materials associated with the asphalt pad *(e.g.*, concrete ringwall, sumps, liner) and a minimum of six inches of the base course and soil underlying the asphalt pad will 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. If it is determined to be appropriate at the time of the assessment, soil samples may be collected through the asphalt (before the pad and its materials have been removed) from areas where contamination is suspected (*i.e*., locations of stains or known spills).

In the event that alternative closure requirements, in accordance Permit Section 9.2.2.2, are applied to the closure of this permitted unit, 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 (Order) (see Permit Section 9.3)) beneath the permitted unit.

### 5.3.2 Decontamination of 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. This includes: the transportainer; the two storage sheds; the PermaCon®; the portable air monitors; all electronic devices and tools; and the spill cleanup equipment containers from within the domes (*see* Table G.10-6). This list of equipment requiring decontamination will be revised, if necessary, during the review and assessment.

Equipment and operating machinery that is not sensitive to water intrusion, such as the transportainer and the equipment cabinets in Dome 231 will be decontaminated by pressure washing or steam cleaning with a solution consisting of a surfactant detergent (*e.g.*, Alconox®) and water mixed in accordance with the manufacturer's recommendations. All other equipment at the permitted unit that is sensitive to water intrusion (*i.e.*, portable air monitors, electronic devices or tools, PPE, portable eyewashes, spill cleanup equipment containers) will be decontaminated by washing using a wipe-down method with a solution consisting of a surfactant detergent (*e.g.*, Alconox®) and water mixed in accordance with the manufacturer's recommendations.

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 wash water and provide containment during the decontamination process. The fire suppression water drains in domes 229, 231 and 232 will be plugged so as to not allow wash water to enter.

### 5.4 Equipment Used During Decontamination Activities

Reusable protective clothing, tools, and equipment used during closure decontamination activities will be cleaned with a wash water solution. Residue, disposable equipment, and equipment that cannot be decontaminated will be containerized and managed as waste, as summarized in Table G.10-2 and in accordance with Permit Section 9.4.5 and Section 7.0 of this closure plan.

## 6.0 SAMPLING AND ANALYSIS PLAN

This SAP addresses the specific closure sampling and analysis requirements in Permit Section 9.4.7 and describes the sampling, analysis, and quality assurance and 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 Decontamination Verification

Soil sampling and decontamination verification wipe sampling activities will be conducted at the permitted unit in order to verify that soils, structures, and related equipment at the permitted unit 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. In compliance with Permit Section 9.4.7.1.i, this closure plan will ensure the collection of at least one wipe sample from the walls, the floor, and the ceiling of the transportainer for a total of 6 wipe samples.

In compliance with Permit Section 9.4.7.1.ii.a, this closure plan will ensure the collection of soil samples in the following locations:

a. one sample in front of the transportainer (*see* Permit Section 9.4.7.1.ii.a(1));

b. one sample every 900 square feet of the permitted unit for a total of 170 samples (*see* Permit Section 9.4.7.1.ii.a(2));

c. one sample to the south of the permitted unit at the stormwater discharge drainage location (‘sample location 1’) (*see* Permit Section 9.4.7.1.ii.a(3));

d. one sample at the discharge point in the sump in Dome 229 for the fire water collection system (‘sample location 2’) (*see* Permit Section 9.4.7.1.ii.a(4));

e. one sample at each location (eastern portion of the permitted unit) where the slope of the permitted unit ends in soil below each PVC drain for a total of ten samples (*see* Permit Section 9.4.7.1.ii.a(4));

f. one sample at each drain in Domes 232 and 231 and one sample at each sump in Dome 229 and 230 for a total of eight samples (*see* Permit Section 9.4.7.1.ii.a(5));

g. one sample at the joints and intersections of the fire water collection system piping (*see* Permit Section 9.4.7.1.ii.a(7)); and

h. one sample, at 30 foot intervals, just off the southern end of the permitted unit along the uncurbed portion of the drainage structure for a total of five samples (*see* Permit Section 9.4.7.1.ii.a(8)).

All soil sample locations are illustrated on Figure G.10-1. If liquid is present at closure in any of the drains, sumps, or piping, a liquid sample will be collected in accordance with Section 6.2.1 of this closure plan.

At the time of sampling, the precise locations of the grid samples will be randomly selected within each 900 square foot sampling box (*see* Figure G.10-1). These locations will be determined by applying a sub-grid of potential sampling points and randomly choosing one. If the review or assessment determines the need to obtain additional samples collected within the area of the sampling box (*e.g.*, at asphalt cracks), these sample locations will be in addition to the grid sample locations.

## 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 incorporates guidance from the United States Environmental Protection Agency (USEPA) (EPA, 1986 and EPA, 2002), DOE (DOE, 1995), and other Department-approved procedures.

### 6.2.1 Liquid Sampling

Liquid samples will be collected and analyzed to determine if residual hazardous constituents are present in the drains, sumps, or pipes at the permitted unit. Liquid samples will be collected using glass or plastic tubes, a composite liquid waste sampler, a bacon bomb, a bailer, or by pouring liquid into sample containers.

### 6.2.2 Wipe Sampling

Surface wipe samples will be collected and analyzed to determine if residual hazardous constituents remain on the structures 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.

### 6.2.3 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.10-4.

### 6.2.4 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 scraped 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/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 a part of the permanent sampling record documenting the sampling effort.

DRAFT

#### 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.10-4 presents the requirements in *SW-846* (EPA, 1986) for sample containers, preservation techniques, and

DRAFT

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 these 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 the hazardous constituents listed in Appendix VIII of 40 CFR Part 261 and in Appendix IX of 40 CFR Part 264 that have been stored at the permitted unit over its operational history. Samples will be analyzed by an independent laboratory using the methods outlined in Table G.10-3. Analytes, test methods and instrumentation, target detection limits, and rationale for metals and organic analyses are presented in Table G.10-3. 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 of this closure plan. 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.10-3 was based on the following considerations:

e. the physical form of the waste;

f. constituents of concern,

g. required detection limits (*e.g.*, regulatory thresholds); and

h. 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.10-5 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 with 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.10-2 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 other small equipment that cannot be decontaminated, as summarized in Table G.10-2, 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.

EPA, 1986 and all approved updates. "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA-*SW-846*, U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, U.S. Government Printing Office, Washington, D.C.

EPA, 2002. "RCRA Waste Sampling Draft Technical Guidance Planning, Implementation, and Assessment," EPA530-D-02-002, August 2002, Office of Solid Waste, U.S. Environmental Protection Agency, Washington, D.C.

LANL, 1999. "Screening Level Ecological Risk Assessment Methods," LA-UR-99-1406, Los Alamos National Laboratory, Los Alamos, New Mexico.

NIOSH, 1994. The National Institute for Occupational Health and Safety (NIOSH) *Manual of Analytical Methods*, 4th ed. Issue 1. 1994.

NMED, 2006. "Technical Background Document for Development of Soil Screening Levels," Rev. 4.0, June 2006, New Mexico Environment Department, Santa Fe, New Mexico.

DRAFT

**Table G.10-1**

**Closure Schedule for the Technical Area 54, Area G, Pad 9 Outdoor Container Storage Unit**

| Activity | Maximum Time Required |
|---|---|
| Notify the Department of intent to close. | -45 days |
| Final receipt of waste. | Day 0 |
| Complete waste removal. | Day 90 |
| Complete records review and structural assessment. | Day 100 |
| Complete all closure activities and submit final closure certification report to the Department. | Day 180 |

DRAFT

**Table G.10-2**

**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 | Technical Area 54 (TA-54) Area G or 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. |
| | 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 | TA-54 Area G or off-site radioactive waste disposal facility |

DRAFT

| 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 | TA-54 Area G or 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 | TA-54 Area G or 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. |
| Dome structures | 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 | TA-54 Area G or 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. |

DRAFT

| Potential Waste Materials | Waste Types | Disposal Options |
|---|---|---|
| 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 waste | TA-54 Area G or 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. |

DRAFT

**Table G.10-3**

**Summary of Analytical Methods**

| Analyte | EPA *SW-846* Analytical Method [a] | Test Methods/ Instrumentation | Target Detection Limit [b] | Rationale |
|---|---|---|---|---|
| ***Metal Analysis*** | | | | |
| Antimony | 6010, 7010 | ICP-AES, GFAA | 20 ug/L | Determine the metal concentration in the samples. |
| Arsenic | 6010, 7010, 7061A | ICP-AES, GFAA, CVAA | 10 ug/L | |
| Barium | 6010, 7010 | ICP-AES,GFAA | 200 ug/L | |
| Beryllium | 6010, 7010 | ICP-AES, GFAA | 0.2 ug/L | |
| Cadmium | 6010, 7010 | ICP-AES, GFAA | 2 ug/L | |
| Chromium | 6010, 7010 | ICP-AES, GFAA | 10 ug/L | |
| Cobalt | 6010, 7010 | ICP-AES, GFAA | 5 ug/L | |
| Copper | 6010, 7010 | ICP-AES, GFAA | 5 ug/L | |
| Lead | 6010, 7010 | ICP-AES, GFAA | 5 ug/L | |
| Mercury | 6010, 7470A, 7471B | ICP-AES, CVAA | 0.2 ug/L | |
| Selenium | 6010, 7010, 7741A | ICP-AES, GFAA, CVAA | 5 ug/L | |
| Silver | 6010, 7010 | ICP-AES, GFAA | 10 ug/L | |
| Thallium | 6010, 7010 | ICP-AES, GFAA | 30 ug/L | |
| Vanadium | 6010, 7010 | ICP-AES, GFAA | 5 ug/L | |
| Zinc | 6010, 7010 | ICP-AES, GFAA | 1 ug/L | |
| ***Organic Analysis*** | | | | |
| Target compound list VOCs plus ten tentatively identified | 8260B | GC/MS | 10 mg/L | Determine the VOCs concentration in the samples. |

DRAFT

| | | | | |
|---|---|---|---|---|
| compounds (TIC) | | | | |
| Target compound list SVOCs plus 20 TICs | 8270D, 8275 | GC/MS | 10 mg/L | Determine the SVOCs concentration in the samples. |
| ***Other Parameters*** | | | | |
| Cyanide | 9010, 9012 | Colorimetric | 20 ug/L | Determine cyanide concentration |

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

[b] 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
FLAA = Flame 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.

DRAFT

**Table G.10-4**

**Sample Containers[a], Preservation Techniques, and Holding Times[b]**

| Analyte Class and Sample Type | Container Type and Materials | Preservation | Holding Time |
|---|---|---|---|
| ***Metals*** | | | |
| TCLP Metals: Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver | Aqueous Media:<br><br>500-mL Wide-Mouth-Polyethylene or Glass with Teflon Liner | Aqueous Media:<br><br>$HNO_3$ to pH <2<br><br>Cool to 4°C | 180 Days |
| | Solid Media:<br><br>125-mL Glass | Solid Media:<br><br>Cool to 4°C | |
| TCLP/Total Mercury | Aqueous Media:<br><br>500-mL Wide-Mouth-Polyethylene or Glass with Teflon Liner | Aqueous Media:<br><br>$HNO_3$ to pH <2<br><br>Cool to 4 °C | 28 Days |
| | Solid Media:<br><br>125-mL Glass | Solid Media:<br><br>Cool to 4°C | |
| ***Volatile Organic Compounds*** | | | |
| Target Compound Volatile Organic Compounds | Aqueous Media:<br><br>Two 40-mL Amber Glass Vials with Teflon-Lined Septa | Aqueous Media:<br><br>HCl to pH<2<br><br>Cool to 4 °C | 14 days |
| | Solid Media:<br><br>125-mL Glass or Two 40-mL Amber Glass Vials with Teflon-Lined Septa | Solid Media:<br><br>Cool to 4°C<br><br>Add 5 mL Methanol or Other Water Miscible Organic Solvent to 40-mL Glass Vials | |
| ***Semi-Volatile Organic Compounds*** | | | |

DRAFT

| | | | |
|---|---|---|---|
| Target Compound Semi-volatile Organic Compounds | Aqueous Media:<br><br>Four 1-L Amber Glass with Teflon-Lined Lid | Aqueous Media:<br><br>Cool to 4 °C | Seven days from field collection to preparative extraction. 40 days from preparative extraction to determinative analysis. |
| | Solid Media:<br><br>250-mL Glass | Solid Media:<br><br>Cool to 4°C | |

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

[b] 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
$HNO_3$ = nitric acid
HCl = hydrochloric acid
L = Liter
mL = milliter
TCLP = Toxicity Characteristic Leaching Procedure

DRAFT

**Table G.10-5**

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

| QC Sample Type | Applicable Analysis [a] | Frequency | Acceptance Criteria |
|---|---|---|---|
| Trip Blank | VOC | One set per shipping cooler containing samples to be analyzed for VOCs | Not Applicable |
| Field Blank | VOC/SVOC, 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[b] | VOC/SVOC, metals | One sample daily | Not Applicable |

[a] For VOC and SVOC 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.

[b] Collected only if reusable sampling equipment used.

DRAFT

**Table G.10-6**

**List of Equipment at the Technical Area 54, Area G, Pad 9 Outdoor Container Storage Unit**

| Equipment | Decontamination | Disposal |
|---|---|---|
| PermaCon® in Dome 231 and associated equipment | X | |
| Transportainer | X | |
| Two storage sheds | X | |
| Equipment and spill kit cabinets | X | |
| Air pallets | X | |
| Container pallets | X | X |
| Communication equipment | X | X |
| Access barriers and chains | X | X |

DRAFT

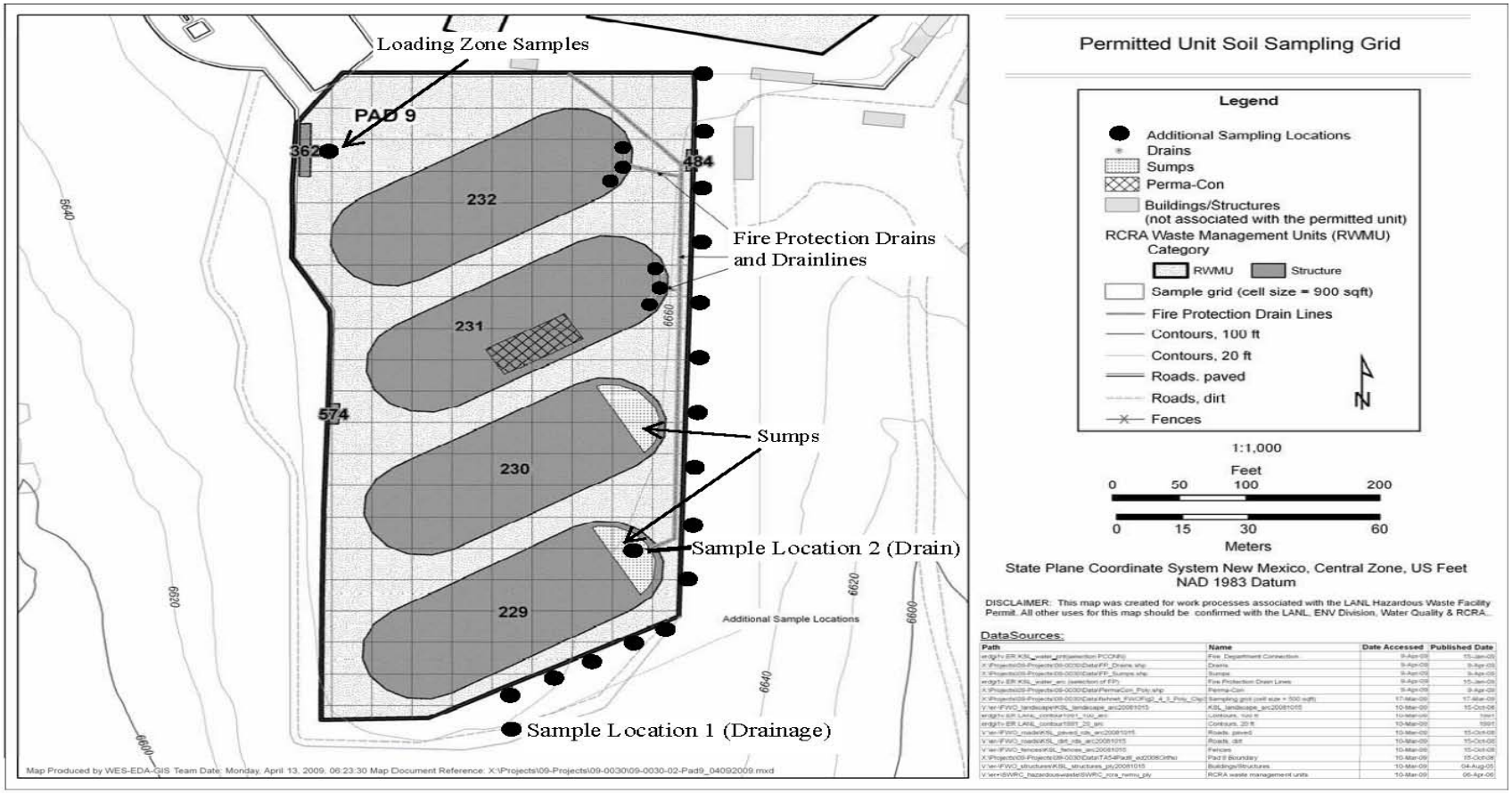


**Figure G.10-1:** Technical Area 54, Area G, Pad 9 Outdoor Container Storage Unit Grid Sampling and Additional Sampling Locations