ATTACHMENT G - CLOSURE PLAN

CLOSURE PLAN

HERITAGE ENVIRONMENTAL SERVICES, LLC
284 EAST STOREY ROAD
COOLIDGE, ARIZONA 85128

AZD 081 705 402

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1. INTRODUCTION

Heritage Environmental Services, LLC ("Heritage") operates a commercial hazardous waste management facility at 284 East Storey Road, Coolidge, Arizona. Heritage has prepared this Closure Plan, including closure cost estimate, in accordance with 40 CFR Part 264, Subpart G.

This Closure Plan will be implemented in the event that final closure of the entire facility becomes necessary. In the event that closure of individual units or areas of the facility becomes necessary, Heritage will implement those provisions of this Closure Plan that are applicable to the unit(s) being closed. Such partial closures may be necessary due to decommissioning of unused equipment, changes in regulatory requirements, modifications of operations, or replacement of permitted units or portions of permitted units during the operating life of the facility. Partial closure of a portion of a hazardous waste management unit would proceed in the same manner described herein for final closure of the entire facility, with respect to removal of inventory and residues, decontamination of equipment and structures, and verification sampling and analysis. The closure activities discussed herein are intended to achieve clean closure of the facility or the unit(s) being closed.

This Closure Plan describes the following aspects of closure:

1. Partial closures;
2. Notification of final closure;
3. Closure schedule;
4. Estimate of maximum inventory at closure;
5. Description of closure activities;
6. Verification sampling and analysis; and,
7. Closure cost estimate.

The following sections of this Closure Plan describe each of these points in detail.

2. FACILITY DESCRIPTION

The Heritage facility in Coolidge, Arizona is a commercial hazardous waste management facility (Standard Industrial Classification 4953/NAICS 562211). The Coolidge facility is located 60 miles south of Phoenix in Pinal County on approximately 80 acres. More specifically, it is located about 1.5 miles south of unincorporated Randolph and 4.5 miles south of the City of Coolidge. A site location map is presented as Figure G-1.

Heritage is permitted to manage RCRA hazardous waste from a wide variety of off-site sources, including but not limited to manufacturing facilities, remediation sites, off-site waste treatment and storage facilities, spill response contractors, and transporters. In general, hazardous wastes managed at the Heritage-Coolidge facility include: solids, liquids, and sludges; contaminated soils and debris; organic wastestreams such as inks, paints, solvents, and other hydrocarbons; contaminated waters and leachate; lab packs; and treatment residues from off-site waste treatment and storage facilities. The specific hazard codes Heritage is permitted to manage are listed in the Coolidge facility's RCRA permit. Heritage is permitted to store 84,601 gallons of hazardous waste and 100 cubic yards of hazardous waste without free liquids in designated areas of the facility.

2.1. Container Storage Areas

The permitted waste activities currently conducted at the Coolidge facility are storage in containers and consolidation of wastes into larger containers, including solids (filter cake) blending. Heritage stores hazardous waste in a variety of container types at the Coolidge facility. Wastes are stored in several different container storage areas. The container storage areas are located throughout the facility. A facility site plan is included as Figure G-2.

2.2. Facility Staging Activities

Heritage manages containers in certain areas of the facility that are not located in permitted storage units. These areas include a ten day transfer area and a loading/unloading area for containerized wastes. These areas are not permitted for storage of hazardous waste and are not designated on the Part A Application. They are identified as staging and loading/unloading areas that were designated by the AZDEQ as SWMU's for the purpose of this closure plan. They are included in the closure plan for the purpose of complying with any future corrective action requirements for the facility. Implementation of the closure requirements for these areas will satisfy any future requirements for corrective action under RCRA for the facility.

2.3. Wastes Accumulated at the Facility

Detailed lists of hazardous wastes managed in the permitted units at the Heritage facility, including chemical descriptions and US EPA hazardous waste codes, are included in the facility's RCRA Part B permit.

FIGURE G-1

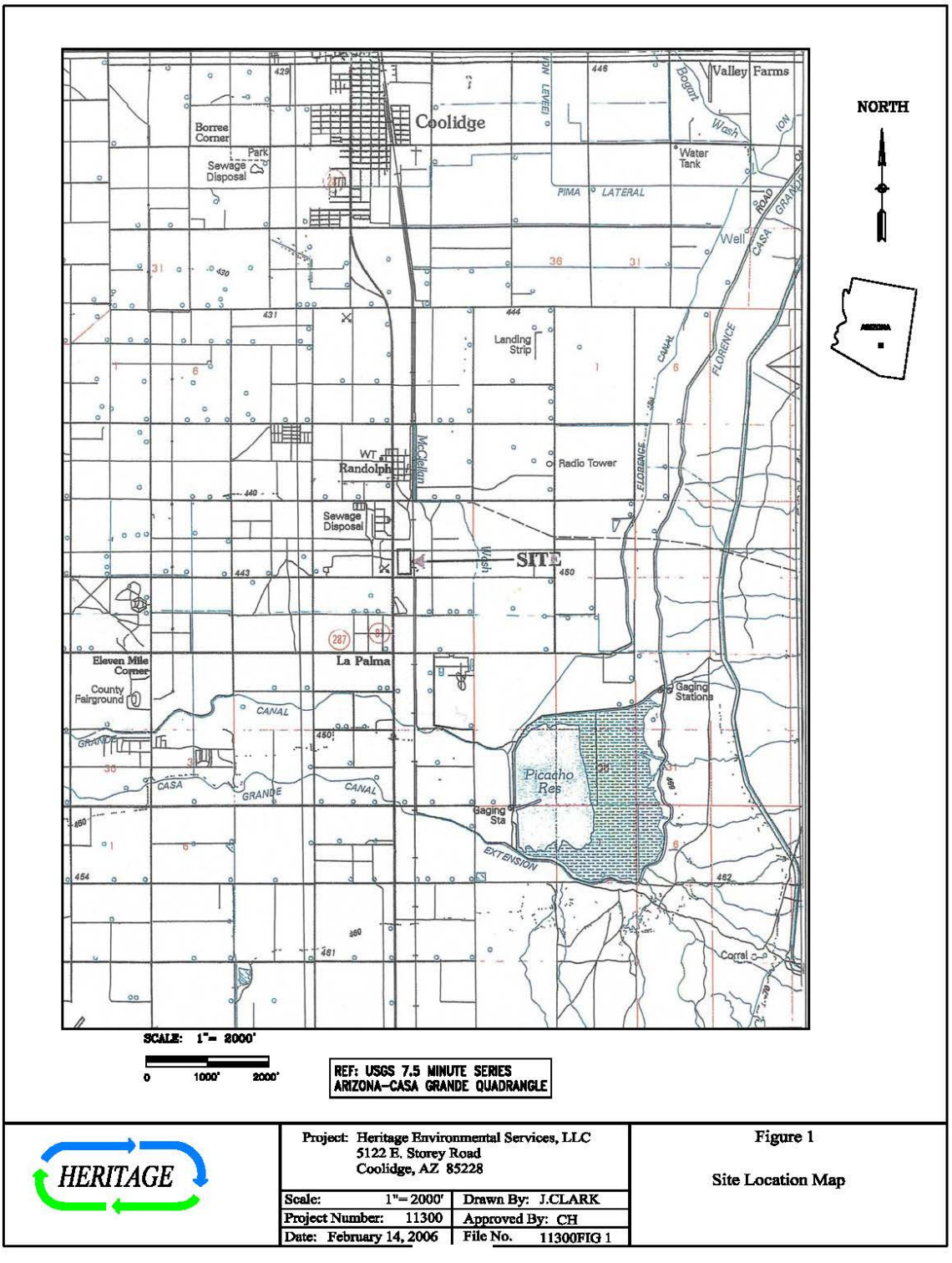

Coolidge
Valley Farms
Borree Corner
Park
Sewage Disposal
Water Tank
PIMA
LATERAL
Well
CASA GRANDE
Landing Strip
CANAL
FLORENCE
WT
Randolph
McClellan
Radio Tower
Sewage Disposal
SITE
La Palma
Eleven Mile Corner
County Fairground
Gaging Stations
CANAL
GRANDE
CASA GRANDE
CANAL
Picacho Res
Gaging Sta
EXTENSION
Corral
NORTH
SCALE: 1"= 2000'
0
1000'
2000'
REF: USGS 7.5 MINUTE SERIES
ARIZONA-CASA GRANDE QUADRANGLE
HERITAGE
Project: Heritage Environmental Services, LLC
5122 E. Storey Road
Coolidge, AZ 85228
Scale: 1"= 2000'
Drawn By: J.CLARK
Project Number: 11300
Approved By: CH
Date: February 14, 2006
File No. 11300FIG 1
Figure 1
Site Location Map
G:\CLIENTS\H-Heritage Environmental Services LLC\Arizona-Coolidge\5500 Excavate Plan\10399FIG1.dwg, Layout1, 5/3/2006 7:14:23 AM

FIGURE G-2

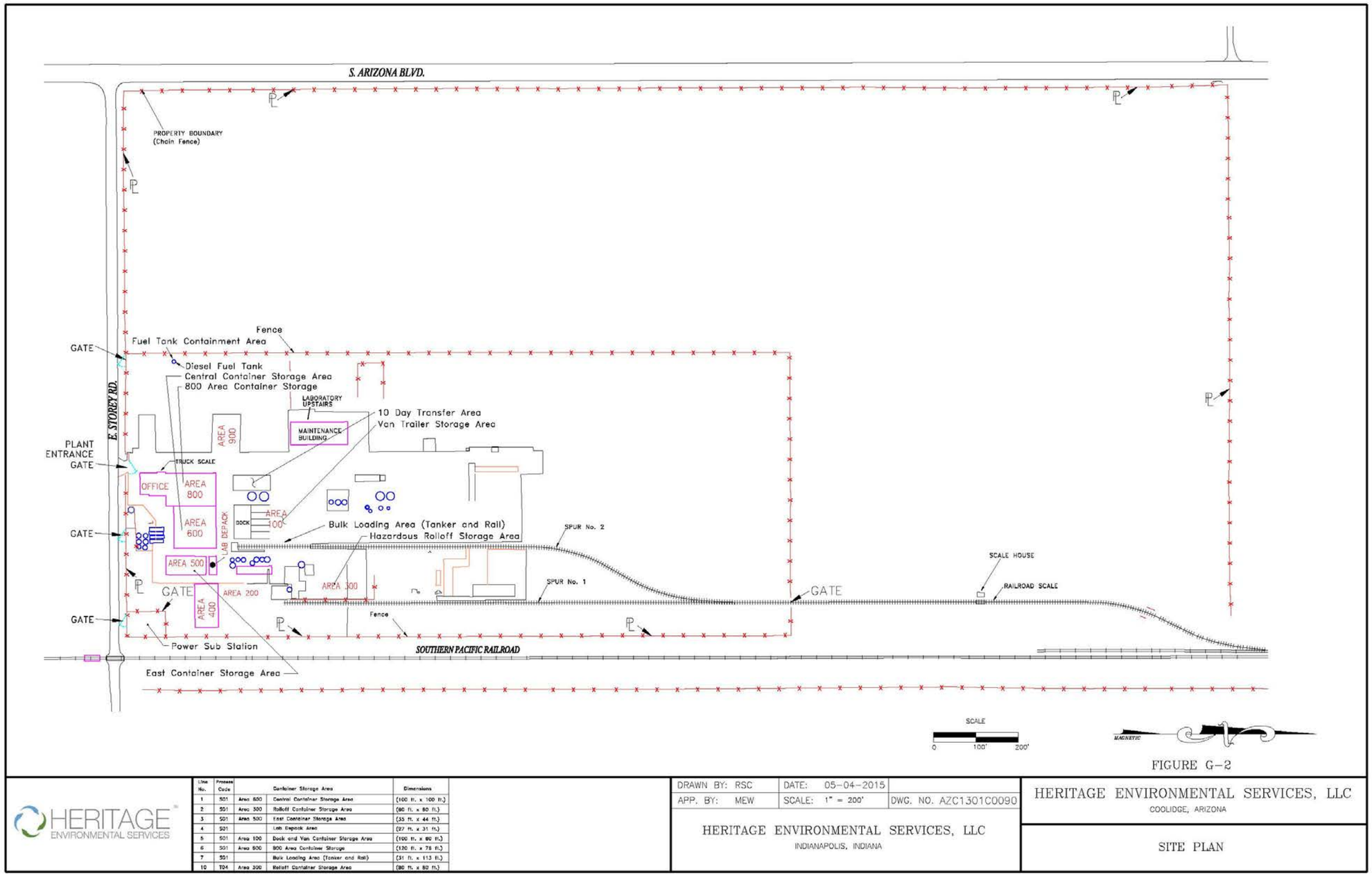


FIGURE G-2

Line No.	Process Code		Container Storage Area	Dimensions
1	S01	Area 850	Central Container Storage Area	(100 ft. x 100 ft.)
2	S01	Area 300	Rolloff Container Storage Area	(80 ft. x 80 ft.)
3	S01	Area 500	East Container Storage Area	(35 ft. x 44 ft.)
4	S01		Lab Depack Area	(27 ft. x 31 ft.)
5	S01	Area 100	Dock and Van Container Storage Area	(100 ft. x 80 ft.)
6	S01	Area 600	800 Area Container Storage	(120 ft. x 75 ft.)
7	S01		Bulk Loading Area (Tanker and Rail)	(31 ft. x 113 ft.)
10	T04	Area 300	Rolloff Container Storage Area	(80 ft. x 80 ft.)

HERITAGE ENVIRONMENTAL SERVICES

DRAWN BY: RSC	DATE: 05-04-2015	
APP. BY: MEW	SCALE: 1" = 200'	DWG. NO. AZC1301C0090

HERITAGE ENVIRONMENTAL SERVICES, LLC
INDIANAPOLIS, INDIANA

HERITAGE ENVIRONMENTAL SERVICES, LLC
COOLIDGE, ARIZONA

SITE PLAN

3. CLOSURE PLAN AND CLOSURE PERFORMANCE STANDARD

The purpose of this Closure Plan is to identify the steps necessary to perform partial and/or final closure of the Heritage facility located in Coolidge, Arizona. This Closure Plan was prepared in accordance with the requirements contained at 40 CFR Parts 264 and 270. Until closure is completed and certified, a copy of the approved Closure Plan and all approved revisions will be maintained at the facility.

3.1. Summary of Closure

Heritage intends to "clean-close" the entire permitted facility during final closure. The final volume of hazardous waste at each waste management unit undergoing closure will be shipped off-site to appropriate management facilities. Units undergoing closure will be decontaminated by removing the remaining inventory of hazardous wastes from the permitted unit(s) and ancillary equipment, if any. Hazardous wastes contained in the permitted waste management units at the commencement of closure will be removed and transported to an authorized facility in accordance with the applicable requirements of 40 CFR Part 268 (Land Disposal Restrictions). After the remaining waste inventory has been removed from the permitted units, Heritage will decontaminate the units by cleaning with a high-pressure, low-volume water and cleaning reagents (detergents or solvents, as appropriate). After decontamination, concrete and soil samples will be collected from each of the units and analyzed to confirm that the units meet the closure performance standard and are suitable for other uses.

3.2. Closure Plan Modification

A written request to the Arizona Department of Environmental Quality for a modification to the approved Closure Plan could become necessary. Such written requests will be made whenever the following occurs:

- Changes in operating plans or facility design that materially affect the Closure Plan;
- There is a change in the expected time frame of closure; or,
- In conducting closure activities, unexpected events require a modification of the approved Plan.

Written requests for modifications will include a copy of the amended Closure Plan and will be submitted for approval at least 60 days prior to the proposed change in facility design or operation, or no later than 60 days after an unexpected event has occurred which has affected the Closure Plan. If an unexpected event occurs during the closure period, the request for modification will be made no later than 30 days after the unexpected event.

This Closure Plan minimizes the need for post closure maintenance and minimizes any waste releases. The main aspects of the Closure Plan are highlighted below:

- All waste is removed.
- All structures and equipment are decontaminated in accordance with the Closure Plan.
- Concrete and soil sampling is conducted to demonstrate that hazardous waste is no longer present at concentrations that are considered detrimental to human health or the environment.

3.3. Closure Performance Standard

Heritage, as owner/operator, will, through the actions described in this Closure Plan, close the permitted container storage areas in a manner that:

- Minimizes the need for further maintenance;
- Controls, minimizes, or eliminates to the extent necessary to be protective of human health and the environment, the escape of hazardous waste, hazardous constituents, leachate, contaminated run-off, or hazardous waste decomposition products to the ground, surface water, or atmosphere;
- Complies with the closure requirements specified in 40 CFR Part 264, Subpart G for container storage areas.

The following sections describe the procedures to meet the closure performance standard for the permitted units at the Heritage facility.

4. NOTIFICATION OF PARTIAL OR FINAL CLOSURE

In accordance with 40 CFR 264.112(d), Heritage will notify the Arizona Department of Environmental Quality in writing at least 45 days prior to the date on which partial or final closure activities are expected to begin. The 45-day notice period is appropriate because no surface impoundment, waste pile, land treatment, or landfill units requiring an earlier notification are present at the Heritage facility. Heritage has not predicted any date upon which the facility would cease operation and undergo final closure. As final closure is not expected prior to expiration of the permits, the expected year of final closure is not required (40 CFR 264.112 (b)(7)). Heritage may require partial closure involving specific units or portions of units as described herein. The estimated closure time frame is discussed in Section 7.

5. ESTIMATE OF MAXIMUM INVENTORY AT CLOSURE

The maximum potential inventory of wastes on-site at the Heritage facility at the time of closure is the sum of the permitted maximum capacities for the container storage areas. Therefore, the estimated maximum waste inventory at closure for the permitted units is 1,538 - 55-gallon equivalents (84,601 gallons) and 100 cubic yards of wastes with no free liquids.

Table G-1 designates the areas that will be subject to decontamination and sampling efforts associated with the closure activities specified in the plan. Table G-1 identifies both permitted units and areas utilized for loading and unloading purposes at the facility.

TABLE G-1
IDENTIFICATION OF AREAS SUBJECT TO CLOSURE ACTIVITIES
HERITAGE ENVIRONMENTAL SERVICES, LLC
COOLIDGE, ARIZONA

Designated Area	Unit Type	Nominal Square Footage
Central Container Storage Area	Permitted Storage	10,000
East Container Storage Area	Permitted Storage	1,452
Lab Depack Area	Permitted Storage	840
Rolloff Container Storage Area	Permitted Storage	6,400
Dock and Van Container Storage Area	Permitted Storage	6,000
800 Area Container Storage	Permitted Storage	9,120
Bulk Loading Area (Tanker and Rail)	Loading/Unloading	3,720
Dock and Van Container Storage - Dock Area [(1)]	Loading Unloading	5,520
10 Day Transfer Area [(1)]	Loading/Unloading	750

[(1)] These areas are not permitted for storage of hazardous waste and are not designated on the Part A Application. They are identified as staging and loading/unloading areas that were designated by the ADEQ as SWMU's for the purpose of this Closure Plan. They are included in the Closure Plan for the purposes of complying with the corrective action requirements for the facility. Implementation of the closure requirements for these areas will satisfy any requirements for corrective action under RCRA for the facility.

6. DESCRIPTION OF CLOSURE ACTIVITIES

This Closure Plan is filed at the Heritage facility and is part of the facility operating record until final closure of the facility. The following activities are addressed with respect to the container storage areas at the Heritage facility:

- Descriptions of how closure will be performed;
- Methods for removing, transporting, treating, and storing or disposing of any waste residues;
- Type(s) of off-site treatment and disposal that may be necessary;
- Description of decontamination and/or removal activities necessary for any residues or contaminated containment system components upon closure of the facility, if necessary;
- Sampling procedures, analytical methods, and criteria for determining whether decontamination activities satisfy the closure performance standard.

The areas that are to be closed in accordance with the procedures specified in this Closure Plan are identified in Table G-1 and are grouped together for purposes of specifying decontamination procedures for similar structures (i.e., open areas comprised of concrete and/or other impervious, flat surfaces). Applicable OSHA regulations regarding the proper use of personal protective equipment, safe work practices, and confined space entry, as applicable, will be followed to protect personnel performing closure activities.

Closure activities involving the container storage areas are summarized below:

1. Waste materials in inventory will be shipped off-site to appropriate management facilities.
2. Any residues present on the surfaces of the pads, sumps, or trench drains associated with the container storage areas will be removed mechanically or manually and appropriately containerized and managed. The actual means of residue removal will depend on the physical properties of the residues present, if any. Removal may be performed using mechanized equipment, or by manual methods such as scraping, sweeping, or shoveling. Residues collected in this phase of closure will be shipped off-site to appropriate management facilities.
3. The interior surfaces of transfer piping, hoses, valves, pumps, and other appurtenances in contact with and associated with the transfer of hazardous waste (“transfer equipment”) will be cleaned by flushing or pressure washing using water and/or solvent or detergent to facilitate cleaning, then rinsed/flushed with water. Wash waters from pressure washing of hazardous waste transfer equipment will be transferred to appropriate containers for shipment to an off-site treatment/storage facility. Metal transfer equipment may be recycled as scrap metal in accordance with 40 CFR Part 261.6(a)(3)(iii). Alternatively, the transfer equipment could be dismantled, containerized for disposal, and disposed as hazardous waste.
4. Following removal of waste materials and any residues, a visual inspection will be performed. Any cracks, gaps, unsealed seams, or damaged areas identified by a visual inspection will be repaired and/or caulked, as appropriate. A Professional Engineer will conduct an inspection prior to repair or caulking to identify possible soil sample locations in accordance with Section 7.1 of this Plan.
5. Floors, trench drains (if any), and sumps (if any) will be pressure-washed using water and/or solvent or detergent to facilitate cleaning, and then will be rinsed with water. An industrial floor cleaner may be used to supplement cleaning of floors. The vacuum mechanism in the industrial floor cleaner may be used to remove the liquids generated during decontamination of these areas. Wash waters from areas with

trench drains and sumps will be removed by vacuum equipment or by pumping. Wash waters will be containerized and shipped off-site.

6. Floors, trench drains, and sumps will be visually inspected to verify that visible hazardous waste residues have been removed. If visually detectable residues remain, then Step 5 (above) will be repeated.
7. Wash waters will be managed as hazardous wastes unless testing indicates otherwise. All wash waters will be containerized and managed on-site or transferred to an appropriate off-site treatment/disposal facility.
8. Flooring surfaces will be inspected for significant visible discoloration, cracks, or deteriorated areas. For the purposes of the visual inspection after decontamination efforts, significant visible discoloration is discoloration that in the best professional judgment of the inspector is the result of the accumulation of hazardous waste that has penetrated into the concrete substrate and is not discoloration associated with fading, coating patches, surficial staining (e.g., rust, moisture, or similar types of discoloration). These areas may be identified for sampling by the inspector as judgmental samples at the time of closure.
9. During final facility closure, sampling and analysis of the concrete floor and soil underlying closed units will be performed in accordance with the sampling and analysis procedures described in Section 7.

A qualified Professional Engineer registered in the state of Arizona will perform a visual inspection of the permitted container storage area and will review analytical results to determine whether the unit has been decontaminated in accordance with the Plan. The visual inspection during closure activities and procedures as described in Section 9 will be used to verify that clean closure has been achieved. The qualified Professional Engineer and an authorized representative of Heritage will certify that closure was completed in accordance with the specifications of the approved Closure Plan.

After decontamination and certification of closure are complete, the affected permitted units and associated equipment, or the facility, will be considered closed and no longer regulated as waste management units. Post-closure activities will not be required because all wastes will be removed and the waste management units will be clean-closed in accordance with the closure performance standard.

7. SAMPLING AND ANALYSIS

This section describes procedures and rationale for concrete and soil sampling and analysis to verify that the closure performance standard has been achieved for the facility. Detailed discussions of quality assurance/quality control procedures are specified in the Quality Assurance Project Plan (QAPP) provided as Appendix G-D. Sample collection and handling activities will be performed by trained personnel in accordance with the procedures specified in this section and in the QAPP. Analytical work will be conducted by Arizona Department of Health Services (ADHS) licensed laboratories in accordance with their established quality assurance/quality control protocols and standard operating procedures for the analytical methods specified in the QAPP.

7.1. Concrete and Soil Sampling Locations

Analysis of concrete and soil samples for the appropriate parameters from multiple locations in the areas undergoing closure will indicate whether constituents remain at levels of regulatory concern. Sampling locations will be selected initially by visual inspection of the concrete surfaces within the container storage areas by the Professional Engineer certifying closure. Based on visual inspection, concrete and soil sampling will be conducted at the bottom of trenches, sumps, and in areas selected by the Professional Engineer that are deteriorated, cracked, or stained, as these would be considered the most likely location for migration of constituents into the soil. These locations will be considered “directed” or “judgmental” sampling locations. Directed sampling locations will take preference over the selection of random sampling locations.

After selecting the locations based on visual inspection, additional sampling locations will be selected using a simple random sampling scheme. Simple random sampling is the method recommended in EPA Publication No. SW-846. This method was chosen as the most efficient and practical manner to accurately determine whether constituents are present in the concrete or soil at regulatory levels of concern.

Random sampling location selection will begin by superimposing a sampling grid that slightly overlaps the boundaries of each waste management unit (e.g., container storage area) to be sampled. The grid will be limited to the boundaries of the unit when obstructed from extending beyond the unit's boundaries by a building or other barrier. A grid interval length of ten feet will be used. The grid interval may be modified if site-specific conditions warrant.

Each grid intersection will represent a potential sampling location and will be assigned a number (1,2,3...n). The locations on each grid for collecting samples will be randomly selected using a statistically acceptable method of generating random numbers, such as a random number generator or random number table. Samples will be collected from each selected grid intersection. Sample locations may be offset slightly if obstructions are encountered.

In areas to be closed that contain sumps or trenches, samples of concrete and soil will be judgmentally collected. Under the assumption that the Professional Engineer certifying closure does not select specific sampling locations based on visual inspection of the concrete floors, the proposed sampling locations for each area undergoing closure (including hypothetical judgmental sampling locations in sumps and trenches) are provided on Figures G-1, G-2, G-3, G-4, G-5, G-6, G-7, and G-8 of the Quality Assurance Project Plan in Appendix G-D.

The anticipated number of sample locations for the permitted container storage areas are shown in Table G-3. There is one sampling location per 800 square-feet of surface area of the unit undergoing closure, with a minimum of three locations per area (even if the area is less than 800 square-feet). In addition, there is one sampling location for each sump and two sampling locations (evenly spaced) for each trench associated with the areas undergoing closure. The number of sample locations may be modified if site-specific conditions warrant.

7.2. Concrete Sampling and Analysis

The following procedures will be used to verify that the concrete floors in the container storage and staging areas undergoing closure have met the closure performance standard. Following decontamination and visual inspection, concrete samples will be collected and analyzed (ran "as is") for the parameters specified in Table G-2 and in the QAPP (Appendix G-D) to verify that no hazardous wastes and their breakdown products detected by the analytical methods and specified in this Closure Plan remain in the concrete floors at levels of regulatory concern following closure.

7.2.1. Concrete Sampling Procedures

At the designated sampling locations, conventional concrete coring procedures will be utilized to obtain one concrete sample per location. The coring device will be decontaminated in accordance with the procedures specified in Section 7.4 or Section 4.5 of the QAPP to ensure that the bit is clean.

The coring device will be operated following the manufacturer's procedures: When conducting the coring process, use clean water to cool the coring tool while minimizing the amount of water accumulating on the concrete floor by vacuuming, wiping, or other similar process. Prior to beginning the coring process, grind, scrape, abrade, or mechanically remove the surface coating of the concrete. Core the concrete approximately six inches or until the coring tool enters into the underlying subgrade. Once drilling is completed, remove the concrete core from the borehole and dry the core with paper towels or other suitable absorbent. After drying the core, use a mechanical device (e.g., hammer/chisel) to break the core into pieces to allow for placement into containers for laboratory analysis. If additional concrete is needed, offset from the original location and obtain additional sample.

Alternatively, the concrete could be jack hammered to a minimum depth of six inches using suitable equipment, and concrete pieces devoid of floor coating could be removed and sized to allow for placement in the sample container.

7.2.2. Concrete Analysis

Concrete samples from the areas undergoing closure will be analyzed for the Target Analyte List (TAL) metals, hexavalent chromium, cyanide, volatile organic compounds, semi-volatile organic compounds, pesticides, and herbicides listed in Table G-2 in accordance with the methods specified Tables 7-1, 7-2, 7-3 and 7-4 of the QAPP (Appendix G-D) or other comparable SW-846 methods. The list of parameters in Table G-2 is based on the types of waste managed at the facility.

7.2.3. Concrete Clean-up Standards

Clean closure will be determined by comparing the analytical results with the Soil Remediation Levels specified for residential land use at A.A.C. R 18-7-205, Appendix A. Alternatively, background samples of concrete could be selected at the facility using data from other units that meet the specified closure levels, or concrete areas that have not been used by the facility for hazardous waste management could be used for a comparison to background.

The constituents and method numbers for analysis of the concrete samples are specified in Tables 7-1, 7-2, 7-3, and 7-4 of the QAPP. Sample collection, handling, storage, and chain-of-custody procedures will be performed in accordance with the procedures specified in the QAPP (Appendix G-D).

7.3. Soil Sampling and Analysis

The following procedures will be used to sample soil underlying hazardous waste management units (e.g., container storage areas) during final facility closure. Samples collected from these areas will be analyzed (ran "as is") for appropriate indicator parameters to verify that no hazardous wastes and their breakdown products detected by the analytical method and specified in this Closure Plan remain in underlying soils at levels of regulatory concern following closure. Sampling will be implemented in accordance with standard procedures for collection of environmental samples and may include compositing of samples in accordance with ADEQ- or U.S. EPA-approved protocols.

Analytical results will be compared to Soil Remediation Levels specified in this Closure Plan (see Tables 7-1, 7-2, 7-3, and 7-4 in Appendix G-D). Clean closure will be determined by comparing the analytical results with the Soil Remediation Levels specified for residential land use at A.A.C. R 18-7-205, Appendix A. If the results of the sampling are below the specified concentration, then the closure performance standard has been met. If sampling results exceed an established Soil Remediation Level, then background samples may be used to demonstrate clean closure in the area being closed. Appropriate remedial measures may be implemented as discussed in Section 7.3.5.

7.3.1. Sample Collection Procedure

At each sampling location, a hand-operated sampling device, such as a hand auger, or mechanized drilling equipment, such as a geoprobe, will be used to bore into the soil subsurface. These activities will be consistent with industry practices. At each sampling location, discrete samples of soil will be collected at a 0- to 1-foot depth interval below natural grade. Soil samples will also be collected at a depth from 1 to 2 feet below natural grade. The samples collected at a depth of 1 to 2 feet below natural grade will be retained for possible later analysis. If analysis at the 0 to 1 foot below natural grade interval indicates that hazardous constituents exceed the Soil Remediation Levels or background concentrations, then samples from 1 to 2 feet below natural grade at the sampling location will be analyzed for those hazardous constituents exceeding the Soil Remediation Levels or background concentration. Alternatively, Heritage may elect to perform additional soil sampling as contemplated by Section 7.3.5.

Each soil sample will be placed in an appropriate container and labeled as specified in the QAPP (Appendix G-D). Before each sample location, the sampling equipment

will be decontaminated as specified in Section 7.4 and in the QAPP. This procedure will be followed to prevent cross-contamination between sample locations. Sample handling, storage, and chain-of-custody procedures will be followed as outlined in the QAPP.

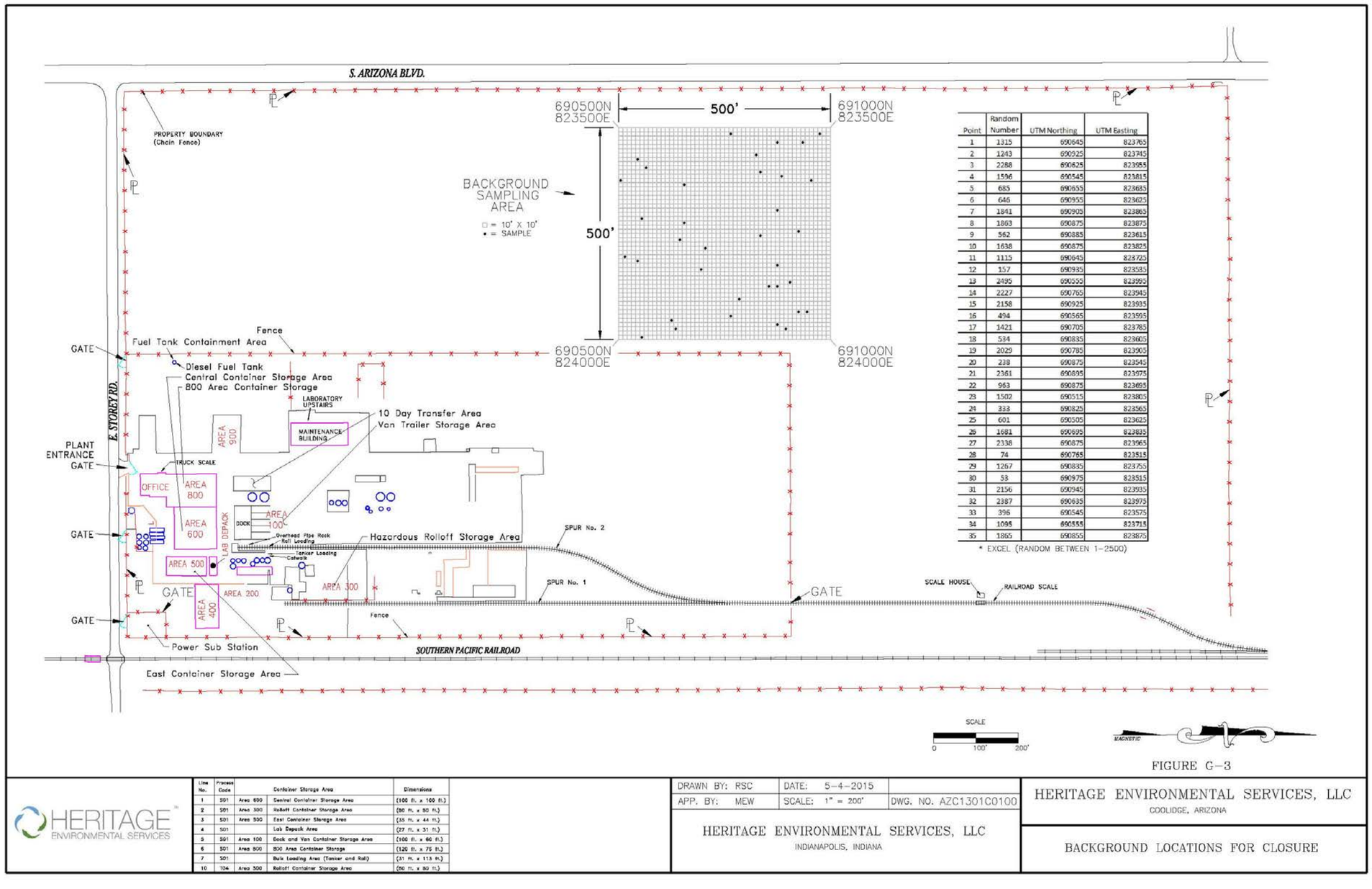
7.3.2. Background Samples

Approximately 30 soil background samples will be collected in areas not used for past or present waste management operations. This should provide an accurate indication of site-specific background conditions of the soil. Background soil samples will be collected in an area of the property not associated with facility operations. The proposed area for collection of background soil samples would be beyond the facility fence within an area specified by on Figure G-3. The specified area has not been utilized for industrial operations. The number of background sample locations may be modified if site-specific conditions warrant.

Background soil boring locations were selected by superimposing a sampling grid over the area to be sampled. A grid interval length of ten feet was used over a 500 by 500 foot square defined by the UTM Coordinates 690500N,823500E; 691000N, 823500E; 690500N,824000E; 691000N, 824000E. The grid interval may be modified if site-specific conditions warrant. Each grid intersection will represent a potential sample location and will be assigned a number (1,2,3...n). Thirty sample locations were randomly selected using a statistically acceptable method of generating random numbers. Samples will be collected from each selected grid intersection. Sample locations may be offset slightly if obstructions are encountered.

Background soil sample borings will be advanced to a total depth of approximately 1 to 2 feet below grade to approximately match the soil depths of the initial investigative soil samples collected from the facility. At each background sample location, a hand-operated sampling device, such as a hand auger, or mechanized drilling equipment, such as a geoprobe, will be used to bore into the soil subsurface. Each background sample will be placed into appropriate sample containers. Each container will be sealed and labeled as specified in the QAPP. Before each sample location, the sampling equipment will be decontaminated as specified in Section 7.4 and in the QAPP. This procedure will be followed to prevent cross-contamination between sample locations. Sample handling, storage, and chain-of-custody procedures will be followed as outlined in the QAPP.

FIGURE G-3



Point	Random Number	UTM Northing	UTM Easting
1	1315	690645	823765
2	1243	690925	823745
3	2288	690625	823985
4	1596	690545	823815
5	685	690655	823685
6	646	690955	823625
7	1841	690905	823865
8	1863	690875	823875
9	562	690885	823615
10	1638	690875	823825
11	1115	690645	823725
12	157	690935	823585
13	2495	690550	823995
14	2227	690765	823945
15	2158	690925	823935
16	494	690565	823595
17	1421	690705	823785
18	534	690835	823605
19	2029	690785	823905
20	238	690875	823545
21	2361	690895	823975
22	963	690875	823695
23	1502	690515	823805
24	338	690825	823565
25	601	690505	823625
26	1681	690695	823835
27	2338	690875	823965
28	74	690765	823515
29	1267	690835	823755
30	53	690975	823515
31	2156	690945	823935
32	2387	690635	823975
33	396	690545	823575
34	1095	690555	823715
35	1865	690855	823875

* EXCEL (RANDOM BETWEEN 1–2500)

FIGURE G–3

Line No.	Process Code		Container Storage Area	Dimensions
1	S01	Area 600	Central Container Storage Area	(100 ft. x 100 ft.)
2	S01	Area 300	Rolloff Container Storage Area	(80 ft. x 80 ft.)
3	S01	Area 500	East Container Storage Area	(35 ft. x 44 ft.)
4	S01		Lab Depack Area	(27 ft. x 31 ft.)
5	S01	Area 100	Dock and Van Container Storage Area	(100 ft. x 60 ft.)
6	S01	Area 800	800 Area Container Storage	(120 ft. x 75 ft.)
7	S01		Bulk Loading Area (Tanker and Rail)	(31 ft. x 113 ft.)
10	T04	Area 300	Rolloff Container Storage Area	(80 ft. x 80 ft.)

HERITAGE ENVIRONMENTAL SERVICES

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APP. BY: MEW	SCALE: 1" = 200'	DWG. NO. AZC1301C0100

HERITAGE ENVIRONMENTAL SERVICES, LLC
INDIANAPOLIS, INDIANA

HERITAGE ENVIRONMENTAL SERVICES, LLC
COOLIDGE, ARIZONA

BACKGROUND LOCATIONS FOR CLOSURE

7.3.3. Soil Analysis

Soil samples will be analyzed for the Target Analyte List (TAL) metals, hexavalent chromium, cyanide, volatile organic compounds, semi-volatile organic compounds, pesticides, and herbicides listed in Table G-2. The analytical methods are detailed in Tables 7-1, 7-2, 7-3, and 7-4 of the QAPP. The results will be recorded and compared to clean closure levels as described in Section 7.3 of this Closure Plan and in the QAPP. The list of parameters in Table G-2 is based on the types of waste managed at the facility.

All 1- to 2- foot sample depths from background sample locations will be analyzed for the TAL metals listed in Table G-2. Inorganic parameters will be analyzed using the methods specified in Table 7-1 of the QAPP (Appendix G-D). Three randomly selected background locations will also be analyzed for the volatile organic compounds, semi-volatile organic compounds, pesticides, and herbicides specified in Table G-2 in accordance with the methods specified in Tables 7-2, 7-3 and 7-4 of the QAPP. Results of these background sample analyses will be used, in part, to establish clean closure levels for each parameter, as discussed in Section 7.2.3 of this Closure Plan and in the QAPP.

7.3.4. Concrete and Soil Quality Assurance/Quality Control Samples

Duplicate samples of concrete and soil also will be submitted for analysis. Field blanks, lab blanks, field duplicates, spike/surrogates, and reference samples will be analyzed in accordance with the procedures specified in the QAPP. The constituents and method numbers for analysis of the QA/QC samples are the same as specified in the QAPP for both the concrete and soil samples. Before each sample location, the sampling equipment will be decontaminated as specified in Section 7.4 and in the QAPP. This procedure will be followed to prevent cross contamination between sample locations. Sample collection, handling, storage, and chain-of-custody procedures for the field blanks, lab blanks, field duplicates, spike/surrogates, and/or reference samples will be performed in accordance with the procedures specified in the QAPP.

7.3.5. Concrete and Soil Remediation Activities and Clean-up Verification

Based on a review of the laboratory data and comparison with the clean closure standard specified in the Closure Plan, Heritage will identify any area(s) requiring further action. Should a concentration of one or more indicator parameters exceed specified clean-closure levels, as validated by QA/QC, appropriate remedial measures would be implemented. The most likely remedial measure to be employed would involve physical removal of concrete and/or contaminated soils to the depth indicated by screening analyses and any additional soil analyses.

After excavation, verification soil samples will be collected and analyzed for the parameters that initially exceeded action levels. Verification sample locations will be randomly selected as discussed in Section 7.1.

Any contaminated soils or residues generated from remedial activities will be characterized and properly treated and/or disposed of at a permitted waste management facility. Appropriate hazardous waste listings will be determined based on the listed hazardous wastes managed in the hazardous waste management unit (e.g., container storage area) being closed. Materials determined to be hazardous

wastes will be characterized in accordance with the appropriate best demonstrated available technology (BDAT) treatment standards under the Land Disposal Restrictions found at 40 CFR Part 268. Results of these analyses will be used to determine whether treatment is necessary to meet the BDAT treatment standards for that waste.

7.4. Decontamination of Sampling Equipment

To mitigate the potential for cross contamination and the introduction of contaminants from external sources, all non-disposable sampling equipment will be decontaminated. Decontamination will be performed prior to sample collection at each sample location. Sampling equipment will be decontaminated in the following manner:

- Equipment will be washed with potable “tap” water or distilled water and phosphate-free soap solution, followed by a thorough rinse with distilled or deionized water.
- Equipment will be allowed to air dry prior to sample collection.
- All disposable sampling equipment will be discarded following the collection of each sample so as to minimize cross-contamination. In addition, sampling personnel will wear clean latex gloves during the collection of each sample. Gloves will be changed prior to collection of each sample.

TABLE G-2
Constituents for Concrete and Soil Analysis
Container Storage and Staging Areas
Heritage Environmental Services, LLC
Coolidge, Arizona

Volatile Organic Compounds[1]		**Semi-Volatile Organic Compounds[1]**		**Inorganic Parameters**
Benzene	trans-1,2-Dichloroethene	Acenaphthene	Hexachlorocyclopentadiene	Arsenic
Bromobenzene	1,2-Dichloropropane	Acenaphthylene	Hexachloroethane	Barium
Bromochloromethane	1,3-Dichloropropene	Anthracene	Indeno(1,2,3-cd)pyrene	Cadmium
Bromodichloromethane	2,2-Dichloropropane	Benzo(a)anthracene	Isophorone	Chromium
Bromoform	1,1-Dichloropropene	Benzo(b)fluoranthene	2-Methylnaphthalene	Lead
Bromomethane	Ethylbenzene	Benzo(g,h,I)perylene	Naphthalene	Mercury
n-Butylbenzene	Hexachlorobutadiene	Benzo(k)fluoranthene	2-nitroaniline	Selenium
sec-Butylbenzene	Isopropyltoluene	Benzyl alcohol	3-nitroaniline	Silver
tert-Butylbenzene	4-Isopropyltoluene	Butylbenzylphthalate	4-nitroaniline	Cyanide
Carbon Tetrachloride	Dichlormethane	Bis (2-chloroethoxy) methane	Nitrobenzene	**Herbicides/Pesticides**
Chlorobenzene	Naphthalene	bis(2-chloroethyl)ether	n-Nitrosodiphenylamine	Aldrin
Dibromochlorobenzene	n-Propylbenezene	bis(2-chloroisopropyl)ether	n-Nitroso-di-n-propylamine	Alpha-BHC
Chloroethane	Styrene	bis(2-ethylhexyl)phthalate	Phenanthrene	Alpha-Chlordane
Chloroform	1,1,1,2-Tetrachloroethane	4-Bromophenylphenylether	2-Picoline	Beta-BHC
Chloromethane	1,1,2,2-Tetrachloroethane	Carbazole	Pyrene	Delta-BHC
2-Chlorotoluene	Tetrachloroethene	4-Chloroaniline	Pyridene	4,4'-DDD
4-Chlorotoluene	Toluene	2-Chloronaphthalene	Tetrachlorobenzenes	4,4'-DDE
1,2-Dibromo-3-chloropropane	1,2,3-Trichlorobenzene	4-Chlorophenylphenylether	Toluenediamine	4,4'-DDT
1,2-Dibromoethane	1,2,4-Trichlorobenzene	Chrysene	1,2,4-Trichlorobenzene	Dieldrin
Dibromomethane	1,1,1-Trichloroethane	Dibenzo(a,h)anthracene	Benzoic Acid	Endosulfan I
1,2-Dichloroethane	1,1,2-Trichloroethane	Dibenzofuran	4-Chloro-3-methylphenol	Endosulfan II
1,3-Dichloroethane	Trichloroethene	1,2-Dichlorobenzene	2-Chlorophenol	Endosulfan Sulfate
1,4-Dichloroethane	Trichlorotrifluoromethane	1,3-Dichlorobenzene	2,4-Dichlorophenol	Endrin
Dichlorodifouoromethane	1,2,3-Trichloropropane	1,4-Dichlorobenzene	2,4-Dimethylphenol	Endrin Ketone
1,1-Dichloroethane	1,2,4-Trimethylbenzene	3,3'-Dichlorobenzidine	4,6-Dinitro-2-methylphenol	Gamma-BHC (Lindane)
1,2-Dichloroethane	1,3,5-Trimethylbenzene	Diethylphthalate	2,4-Dinitrophenol	Gamma-Chlordane
1,1-Dichloroethene	Vinyl chloride	Dimethylphthalate	2-Methylphenol	Heptachlor
cis-1,2-Dichloroethene	o-Xylene	di-n-butylphthalate	4-Methylphenol	Heptachlor Epoxide
	m-/p-Xylene	Dinitrobenzene	2-Nitrophenol	Methoxychlor
		2,4-Dinitrotoluene	4-Nitrophenol	Toxaphene
		2,6-Dinitrotoluene	Pentachlorophenol	2,4,5-Trichlorophenoxyacetic acid
		di-n-octylphthalate	Phenol	2,4-Dichlorophenoxyacetic acid (2,4-D)
		Fluoranthene	Tetrachlorophenol	Silvex (2,4,5-TP)
		Fluorene	2,4,5-Trichlorophenol	
		Hexachlorobenzene	2,4,6-Trichlorophenol	
		Hexachlorobutadiene		

Note: [1] Volatile organic compound and semi-volatile organic compound analyses will include tentatively identified compounds (TICs).

Table G-3

ESTIMATED NUMBER OF SOIL, CONCRETE AND QUALITY ASSURANCE QUALITY CONTROL SAMPLES
HERITAGE ENVIRONMENTAL SERVICES, LLC
COOLIDGE, ARIZONA

Sampling Location [1], [3]	Number of Samples	Sample Matrix	Laboratory Parameters [2]	Field Quality Assurance Quality/ Control Samples [4]								Estimated Totals
				Estimated Investigative Samples		Field Matrix Duplicates		Field Trip Blanks [5]		Field Blanks		
				Number	Total	Number	Total	Number	Total	Number	Total	
SOIL SAMPLES												
Central Container Storage Area	19	Soil	Table 7-1, Table 7-2, Table 7-3 , and Table 7-4	1	19	1	1	1	1	1	1	22
East Container Storage Area	4	Soil	Table 7-1, Table 7-2, Table 7-3 , and Table 7-4	1	4	0	0	0	0	0	0	4
Lab Depack Storage Area	4	Soil	Table 7-1, Table 7-2, Table 7-3 , and Table 7-4	1	4	1	1	1	1	1	1	7
Rolloff Container Storage Area	11	Soil	Table 7-1, Table 7-2, Table 7-3 , and Table 7-4	1	11	1	1	1	1	1	1	14
Dock and Van Container Storage Area	12	Soil	Table 7-1, Table 7-2, Table 7-3 , and Table 7-4	1	12	1	1	1	1	1	1	15
800 Area Container Storage	14	Soil	Table 7-1, Table 7-2, Table 7-3 , and Table 7-4	1	14	1	1	1	1	1	1	17
Bulk Loading Area (Tanker and Rail)	4	Soil	Table 7-1, Table 7-2, Table 7-3 , and Table 7-4	1	4	0	0	0	0	0	0	4
Dock and Van Container Storage Area - Loading Unloading Station	8	Soil	Table 7-1, Table 7-2, Table 7-3 , and Table 7-4	1	8	0	0	0	0	0	0	8
10 Day Transfer Area	4	Soil	Table 7-1, Table 7-2, Table 7-3 , and Table 7-4	1	4	0	0	0	0	0	0	4
Background Borings - Metals	30	Soil	Table 7-1	1	30	1	1	0	0	0	0	31
Background Borings - Metals & Organics	3	Soil	Table 7-1, Table 7-2, Table 7-3 , and Table 7-4	1	3	0	0	1	1	1	1	5
Estimated Total Soil Samples					***113***		***6***		***6***		***6***	***131***
CONCRETE SAMPLES												
Central Container Storage Area	16	Concrete	Table 7-1, Table 7-2, Table 7-3 , and Table 7-4	1	16	1	1	1	1	1	1	19
East Container Storage Area	3	Concrete	Table 7-1, Table 7-2, Table 7-3 , and Table 7-4	1	3	0	0	0	0	0	0	3
Lab Depack Storage Area	3	Concrete	Table 7-1, Table 7-2, Table 7-3 , and Table 7-4	1	3	1	1	1	1	1	1	6
Rolloff Container Storage Area	9	Concrete	Table 7-1, Table 7-2, Table 7-3 , and Table 7-4	1	9	1	1	0	0	0	0	10
Dock and Van Container Storage Area	10	Concrete	Table 7-1, Table 7-2, Table 7-3 , and Table 7-4	1	10	1	1	1	1	1	1	13
800 Area Container Storage	12	Concrete	Table 7-1, Table 7-2, Table 7-3 , and Table 7-4	1	12	1	0	1	1	1	1	14
Bulk Loading Area (Tanker and Rail)	3	Concrete	Table 7-1, Table 7-2, Table 7-3 , and Table 7-4	1	3	0	0	0	0	0	0	3
Dock and Van Container Storage Area - Loading Unloading Station	7	Concrete	Table 7-1, Table 7-2, Table 7-3 , and Table 7-4	1	7	0	0	0	0	0	0	7
10 Day Transfer Area	3	Concrete	Table 7-1, Table 7-2, Table 7-3 , and Table 7-4	1	3	0	0	0	0	0	0	3
Total Estimated Concrete Samples					***66***		***4***		***4***		***4***	***78***

(1) Figures 1-1 through 1-8 of QAPP (Appendix D) shows the randomly selected locations where the proposed soil borings will be installed. A site plan of the facility is provided on Figure I-2 of the closure plan showing the location of the permitted units.
(2) For analytical methods, practical quantitation limits, see Tables 7-1, 7-2, 7-3, and 7-4 of QAPP. See closure plan for list of analytes at each unit being closed.
(3) The frequency of sampling is one for the closure of each unit in the Closure Plan
(4) Additional sample volume required for matrix spike/matrix spike duplicate samples that will be submitted at a frequency of 1:20. Minimum frequency for matrix duplicates is 1:20
(5) Trip blanks will only be tested for volatile organic compounds.

7.5. Closure Waste Management

During closure of the container storage and staging areas, Heritage will ship closure wastes off site to appropriate authorized treatment, storage, and disposal facilities. Any inventory remaining at the commencement of closure activities will be shipped to an off-site facility that offers the waste management method(s) for which the wastestreams were approved during the wastestream approval process specified in the facility's Waste Analysis Plan (Permit Attachment B). Closure wastes generated from decontamination activities (e.g., wash waters) will be characterized and properly treated and/or disposed of at a permitted waste management facility in accordance with the following order of preference: 1) ship off site to another Heritage facility; or 2) ship off-site to a third party commercial waste management facility.

Although other Heritage facilities will be able to accept and manage wastes from the Coolidge facility, for purposes of preparing this Closure Plan, it is assumed that a third party facility will perform all processing, treatment, and disposal. Heritage maintains an extensive list of third party facilities approved for receipt of wastes. This list will change over time as approved facilities are added and others are deleted. The final selection of actual third party facilities at the time of closure will depend on a variety of factors including, but not limited to:

1. The current permit and compliance status of the facility;
2. The current financial viability of the facility;
3. Processing capabilities of the facility relative to waste-specific physical and chemical characteristics of the waste;
4. Current regulatory requirements for management of the particular waste type, including Land Disposal Restrictions requirements;
5. Current pricing and market factors for the type of management conducted by the facility;
6. Distance to the facility relative to competitors and cost-effectiveness of the mode of transport (e.g., rail vs. highway).

Heritage will use only RCRA-permitted or approved interim status facilities for treatment, storage, or disposal of any hazardous wastes generated during closure. Facilities used for management of non-hazardous wastes generated during closure will be permitted in accordance with the applicable state's regulations regarding treatment, storage, or disposal of non-hazardous waste.

Treatment/disposal arrangements for the wastes in inventory at closure and the wastes generated during closure will be made by following the facility-specific procedures required by the off-site disposal facility. Wastes in inventory at closure will already have established waste profiles available, in accordance with the Heritage Waste Analysis Plan (Permit Attachment B). For wastes generated during closure, Heritage will appropriately characterize each waste stream and make a proper hazardous waste determination in accordance with 40 CFR Part 262.11. Investigation derived waste (i.e., soil samples, personal protective equipment, and decontamination materials) will be managed in accordance with the ADEQ policy on Investigation Derived Waste, which is incorporated by reference. Appropriate hazardous waste listings will be determined based on the listed hazardous wastes managed in the waste management unit being closed. Materials determined to be hazardous wastes will be evaluated with respect to

the appropriate treatment standards under the Land Disposal Restrictions found at 40 CFR Part 268. Results of these determinations will be used to determine whether treatment is necessary to meet the LDR requirements.

Off-site shipments of hazardous wastes from Heritage will be accompanied by a uniform hazardous waste manifest. Land Disposal Restriction notices will accompany the shipment, where required, in accordance with 40 CFR Part 268. Wastes will be properly described, packaged, marked, and labeled in accordance with applicable US DOT regulations found at 49 CFR Parts 171-l79.

8. CLOSURE SCHEDULE

Within 90 days after receiving the known final volume of hazardous waste at a specific hazardous waste management unit (partial closure) or at the entire facility (final closure), Heritage will remove hazardous wastes remaining in units undergoing closure in accordance with this Plan.

An anticipated schedule for final closure of the Heritage facility is provided in Appendix G-A.

9. EXTENSION FOR CLOSURE

Within 90 days after receiving the known final volume of waste at a specific waste management unit (partial closure) or at the entire facility (final closure), Heritage will complete removal of the waste in accordance with the approved Closure Plan. Although not anticipated, Heritage may propose modifications to the approved Closure Plan or otherwise petition the Arizona Department of Environmental Quality (ADEQ) to obtain approval for a longer period to remove the waste. Closure regulations found at 40 CFR Part 264.113(a) allow approval of a longer period for removal of the final volume of wastes, provided that Heritage complies with all applicable requirements for requesting a permit modification and demonstrates that:

- the activities required to comply with this time period will, of necessity, take longer than the allotted time to complete; or
- the waste management unit or facility has the capacity to receive additional wastes; and,
- there is a reasonable likelihood that Heritage or another person will recommence operation of the waste management unit or the facility within one year; and,
- closure of the waste management unit or facility would be incompatible with continued operation of the site; and,
- Heritage has taken and will continue to take all steps to prevent threats to human health and the environment, including maintaining compliance with all applicable permit requirements.

Within 180 days after receiving the known final volume of waste at a specific waste management unit (partial closure) or at the entire facility (final closure), Heritage will complete closure activities in accordance with the approved Closure Plan. Although not anticipated, Heritage may propose modification to the approved Closure Plan or otherwise petition the ADEQ to obtain an extension to the closure period. Closure regulations found at 40 CFR 264.113(b) allow for approval of an extension to the closure period, provided that Heritage complies with all applicable requirements for requesting a permit modification and demonstrates that:

- The partial or final closure activities required to comply with the closure plan will, of necessity, take longer than 180 days to complete; or
- The waste management unit or facility has the capacity to receive additional wastes; and,
- There is a reasonable likelihood that Heritage or another person will recommence operation of the unit within one year; and,
- Closure of the waste management unit or facility would be incompatible with continued operation of the site; and,
- Heritage has taken and will continue to take steps to prevent threats to human health and the environment, including maintaining compliance with applicable permit requirements.

The demonstration with respect to the extension of the 90-day period will be made at least 30 days prior to the expiration of the 90-day period allowed for removal of all wastes from the unit or facility. The demonstration with respect to extension of the 180-day period will be made at least 30 days prior to the expiration date for completion of closure activities.

10. CERTIFICATION OF CLOSURE

The certification process and the documents that will be prepared following completion of the closure process are described below.

10.1. Closure Certification

Within 60 days after completion of partial or final closure, Heritage will submit to the ADEQ by certified mail, a certification that the waste management unit or facility, as applicable, has been closed in accordance with the approved Closure Plan. The certification will be signed by an appropriate authorized signatory of Heritage and by a qualified Professional Engineer registered in the State of Arizona. Documentation supporting the qualified Professional Engineer's certification will be furnished to the ADEQ upon request until Heritage is released from the financial assurance requirements for closure. Certification language will conform to specified requirements current at the time of closure. An example of closure certification language is presented in Appendix G-B.

10.2. Closure Report

A closure documentation report will be submitted upon the request of the ADEQ. The closure documentation report will include the following:

- The volume of the waste removed
- The method of waste handling and transport
- Waste manifest numbers or copies of manifests
- The sampling and analysis methods utilized
- A chronological summary of closure activities
- Analytical results
- A request for release from the financial assurance requirement

11. CLOSURE COST ESTIMATE

The estimated costs for the closure of the container storage and staging areas at the Heritage facility in Coolidge, Arizona are itemized below. The itemized estimated closure costs and the total estimated cost for the closure of the container storage and staging areas are provided in Table G-4. The closure cost estimate was compiled utilizing third-party transportation, treatment, and disposal firms. Portions of this closure cost estimate may be applicable in the event of partial closure(s) involving individual waste management units.

This closure cost estimate will be modified within 30 days after a revision has been made to the Closure Plan that increases the cost of closure, as required. The total closure cost estimate will be updated annually in accordance with the guidelines provided at 40 CFR 264.142(b).

TABLE G-4
ESTIMATED CLOSURE COSTS
HERITAGE ENVIRONMENTAL SERVICES, LLC
COOLIDGE, ARIZONA

LINE	DESCRIPTION	UNITS	AMOUNT	UNIT COST	TOTALS	EXPLANATORY NOTES	SOURCE INFORMATION
	Disposal of Maximum Inventory						
1	Flammable/Combustible Liquids	55 Gallon Containe	584	$ 186.25	$ 108,769		Cost Pro v. 6.0 Mid Range - Disposal Item 2
2	Flammable Solids	55 Gallon Containe	141	$ 263.50	$ 37,154		Cost Pro v. 6.0 Mid Range -Disposal Item 8a
3	Incineration	55 Gallon Containe	94	$ 263.50	$ 24,769		Cost Pro 6.0 Mid Range - Disposal Item 8a
4	Acids	55 Gallon Containe	98	$ 186.43	$ 18,270		Cost Pro 6.0 Mid Range -Disposal Item 2
5	Caustics	55 Gallon Containe	98	$ 186.43	$ 18,270		Cost Pro 6.0 Mid Range -Disposal Item 2
6	Aqueous Solutions with Heavy Metals	55 Gallon Containe	98	$ 186.43	$ 18,270		Cost Pro 6.0 Mid Range -Disposal Item 2
7	Cyanide	55 Gallon Containe	35	$ 186.43	$ 6,525		Cost Pro 6.0 Mid Range -Disposal Item 2
8	Lab Pack - Treatable	55 Gallon Containe	65	$ 255.25	$ 16,591		Cost Pro 6.0 Mid Range - Item 27
9	Lab Pack - Incinerable	55 Gallon Containe	65	$ 382.88	$ 24,887		Cost Pro 6.0 Mid Range - Item 26 @ 150/lbs
10	RCRA Subtitle C Landfill Solids	55 Gallon Containe	141	$ 263.50	$ 37,154		Cost Pro 6.0 Mid Range - Item 8a
11	Miscellaneous	55 Gallon Containe	117	$ 263.50	$ 30,830		Cost Pro 6.0 Mid Range - Item 8a
12	Dry Bulk Solid Wastes	Yards	100	$ 158.31	$ 15,831		Cost Pro 6.0 Mid Range - Item 7a
13	Excavated Soil and Concrete	Yards	227	$ 244.76	$ 55,454		Cost Pro 6.0 Mid Range - Item 16a
14	Decontamination Liquids - Containment Areas	Gallons	163,128	$ 0.42	$ 67,961		Cost Pro 6.0 Mid Range - Item 26 (Numbering Error in Cost Pro)
15	**Disposal Subtotal**				**$ 480,735**		
	Transportation						
16	Container Storage Area Wastes	Load	19	$ 4,367.54	$ 83,857	80 Containers/Load	Quoted Price Per Mile for Transportation to TSDs
17	Dry Bulk Solid Wastes	Load	7	$ 2,821.50	$ 19,751	15 Tons/Box	Quoted Price Per Mile for Transportation to TSDs
18	Excavated Soil and Concrete	Load	23	$ 2,821.50	$ 64,895	15 Tons/Box @ 1.5 Tons/Yard - Concrete @ 4000 lbs/yd - Soil @2000 lbs/yd	Quoted Price Per Mile for Transportation to TSDs
19	Decontamination Liquids - Containment Areas	Load	30	$ 517.28	$ 15,518	5500 gallons/load	Quoted Price Per Mile for Transportation to TSDs
20	**Transportation Subtotal**				**$ 184,021**		
	Decontamination and Dismantling						
21	Removal and Loading of Containerized Wastes	Units	1,536	$ 3.31	$ 5,080	Cost to Move Containers and Load On Trucks	Cost Pro Unit Rate Provided by ADEQ
22	Removal and Loading of Bulk Containers	Units	5	$ 50.13	$ 251	Cost to Load Onto Trucks	Estimated Cost for Contractor to Supervise Loading
23	Sweeping of Concrete Surfaces	Square Feet/1000	41	$ 23.82	$ 971	Square Footage of Closure Areas Manually Swept or Vacuumed	Cost Pro 6.0 Unit Rate
24	Pressure Washing and Rinsing of Concrete	Square Feet	40,782	$ 2.77	$ 112,984	Square of Footage of Concrete Floors Closure Areas	Cost Pro 6.0 Unit Rate
25	Pumping of Decontamination Water to Portable Tank	1000 Gallons	163	$ 4.23	$ 689		Cost Pro 6.0 Unit Rate
26	Demolition of Concrete	Square Feet	4078	$ 2.08	$ 8,495	10% of Square Footage	Cost Pro and Calculate Volume of Material @ 0.75 feet thick to accommodate curbing
27	Removal of Concrete and Loading	Cubic Yards	113	$ 23.37	$ 2,648	10% of Square Footage Removed to a depth of 0.75 feet	Cost Pro 6.0 Unit Rate
28	Removal of Contaminated Soil	Cubic Yards	113	$ 3.34	$ 379	10% of Square Footage Removed to a depth of 0.75 feet	Cost Pro 6.0 Unit Rate
29	Storage Containers for Concrete and Soil	Week	23	$ 667.72	$ 15,128	15 Tons/Box	Cost Pro Unit Rate for Roll Off Boxes Assuming Concrete at 4000 lbs/yard
30	Bulk Storage Container for Decontamination Liquids	Month	6	$ 918.90	$ 5,513	21,000 Gallons/Container, 2 Containers for 3 months	Baker Tanks Unit Rate * 30 Days - Baker Tank Fee Schedule
31	Mobilization/Demobilization Containers	Each	29	$ 520.76	$ 14,923	Mobilization/Demobilization Costs for Portable Containers	Cost Pro V.6.0 Drop Fee for Roll Off Boxes - Baker Tanks 21,000 Gallons
32	**Decontamination and Dismantling Subtotal**				**$ 167,062**		
	Concrete & Soil Sampling						
33	Central Container Storage Area	Sample Locations	16	$ 275.61	$ 4,410	2 Samples/Location - Grid Based on Closure Plan Random/Judgmental Sample Criteria	Cost Pro Per Location for Both Concrete Coring and Soil Boring Provided by ADEQ
34	East Container Storage Area	Sample Locations	3	$ 275.61	$ 827	2 Samples/Location - Grid Based on Closure Plan Random/Judgmental Sample Criteria	Cost Pro Per Location for Both Concrete Coring and Soil Boring Provided by ADEQ
35	Lab Depack Storage Area	Sample Locations	3	$ 275.61	$ 827	2 Samples/Location - Grid Based on Closure Plan Random/Judgmental Sample Criteria	Cost Pro Per Location for Both Concrete Coring and Soil Boring Provided by ADEQ
36	Rolloff Container Storage Area	Sample Locations	9	$ 275.61	$ 2,480	2 Samples/Location - Grid Based on Closure Plan Random/Judgmental Sample Criteria	Cost Pro Per Location for Both Concrete Coring and Soil Boring Provided by ADEQ
37	Dock and Van Container Storage Area	Sample Locations	10	$ 275.61	$ 2,756	2 Samples/Location - Grid Based on Closure Plan Random/Judgmental Sample Criteria	Cost Pro Per Location for Both Concrete Coring and Soil Boring Provided by ADEQ
38	800 Area Container Storage	Sample Locations	12	$ 275.61	$ 3,307	2 Samples/Location - Grid Based on Closure Plan Random/Judgmental Sample Criteria	Cost Pro Per Location for Both Concrete Coring and Soil Boring Provided by ADEQ
39	Bulk Loading Area (Tanker and Rail)	Sample Locations	3	$ 275.61	$ 827	2 Samples/Location - Grid Based on Closure Plan Random/Judgmental Sample Criteria	Cost Pro Per Location for Both Concrete Coring and Soil Boring Provided by ADEQ

TABLE G-4
ESTIMATED CLOSURE COSTS
HERITAGE ENVIRONMENTAL SERVICES, LLC
COOLIDGE, ARIZONA

LINE	DESCRIPTION	UNITS	AMOUNT	UNIT COST	TOTALS	EXPLANATORY NOTES	SOURCE INFORMATION
40	Dock and Van Container Storage Area - Loading Unloading Station	Sample Locations	7	$ 275.61	$ 1,929	2 Samples/Location - Grid Based on Closure Plan Random/Judgmental Sample Criteria	Cost Pro Per Location for Both Concrete Coring and Soil Boring Provided by ADEQ
41	10 Day Transfer Area	Sample Locations	3	$ 275.61	$ 827	2 Samples/Location - Grid Based on Closure Plan Random/Judgmental Sample Criteria	Cost Pro Per Location for Both Concrete Coring and Soil Boring Provided by ADEQ
42	Background Samples	Sample Locations	30	$ 212.97	$ 6,389	1 Soil Sample Per Location	Cost Pro Per Location for Both Concrete Coring and Soil Boring Provided by ADEQ
43	Waste Determination Sampling	Samples Collected	12	$ 204.20	$ 2,512	8 Samples Collected at $100/Sample	See SA-6, Heritage Estimate is 2X the CostPro for collection of water samples etc.
44	**Sampling Subtotal**				**$ 27,091**		
	Soil and Concrete Sample Analysis						
45	Central Container Storage Area	Samples	41	$ 1,202.55	$ 49,305	TAL Metals, Hexavalent Chromium, Cyanide, Volatiles, Semi Volatiles, Pesticides and	Orange Coast Laboratories - 2010 Quotation
46	East Container Storage Area	Samples	7	$ 1,202.55	$ 8,418	TAL Metals, Hexavalent Chromium, Cyanide, Volatiles, Semi Volatiles, Pesticides and Herbicides	Orange Coast Laboratories - 2010 Quotation
47	Lab Depack Storage Area	Samples	13	$ 1,202.55	$ 28,861	TAL Metals, Hexavalent Chromium, Cyanide, Volatiles, Semi Volatiles, Pesticides and Herbicides	Orange Coast Laboratories - 2010 Quotation
48	Rolloff Container Storage Area	Samples	24	$ 1,202.55	$ 33,671	TAL Metals, Hexavalent Chromium, Cyanide, Volatiles, Semi Volatiles, Pesticides and Herbicides	Orange Coast Laboratories - 2010 Quotation
49	Dock and Van Container Storage Area	Samples	28	$ 1,202.55	$ 33,671	TAL Metals, Hexavalent Chromium, Cyanide, Volatiles, Semi Volatiles, Pesticides and Herbicides	Orange Coast Laboratories - 2010 Quotation
50	800 Area Container Storage	Samples	31	$ 1,202.55	$ 37,279	TAL Metals, Hexavalent Chromium, Cyanide, Volatiles, Semi Volatiles, Pesticides and Herbicides	Orange Coast Laboratories - 2010 Quotation
51	Bulk Loading Area (Tanker and Rail)	Samples	7	$ 1,202.55	$ 8,418	TAL Metals, Hexavalent Chromium, Cyanide, Volatiles, Semi Volatiles, Pesticides and Herbicides	Orange Coast Laboratories - 2010 Quotation
52	Dock and Van Container Storage Area - Loading Unloading Station	Samples	15	$ 1,202.55	$ 18,038	TAL Metals, Hexavalent Chromium, Cyanide, Volatiles, Semi Volatiles, Pesticides and Herbicides	Orange Coast Laboratories - 2010 Quotation
53	10 Day Transfer Area	Samples	7	$ 1,202.55	$ 8,418	TAL Metals, Hexavalent Chromium, Cyanide, Volatiles, Semi Volatiles, Pesticides and Herbicides	Orange Coast Laboratories - 2010 Quotation
54	Background Samples - Metals	Samples	31	$ 335.48	$ 10,400	TAL Metals, Hexavalent Chromium, Cyanide, Volatiles, Semi Volatiles, Pesticides and Herbicides	Orange Coast Laboratories - 2010 Quotation
55	Background Samples - Metals & Organics	Samples	5	$ 1,202.55	$ 6,013	TAL Metals, Hexavalent Chromium, Cyanide, Volatiles, Semi Volatiles, Pesticides and Herbicides	Orange Coast Laboratories - 2010 Quotation
56	Decontamination Wash Water	Samples	1	$ 1,202.55	$ 1,203	TAL Metals, Hexavalent Chromium, Cyanide, Volatiles, Semi Volatiles, Pesticides and Herbicides	Orange Coast Laboratories - 2010 Quotation
57	Waste Determination Analysis - Decontamination Liquid	Samples	8	$ 1,202.55	$ 9,341	1 Sample Per Portable Tank Generated, TAL Metals, Cyanide, Volatiles, Semi Volatiles, Pesticides and Herbicides	Orange Coast Laboratories - 2010 Quotation
58	Waste Determination Analysis - Soil/Concrete	Samples	5	$ 170.32	$ 772	1 Sample Per 50 Cubic Yards Generated, TCLP RCRA Metals	Orange Coast Laboratories - 2010 Quotation
59	**Sample Analysis Subtotal**				**$ 253,808**		
60	**Subtotal Closure Costs (2012 Dollars)**				**$1,112,717**		Adjusted all costs from 2001 CostPro Dollars to 2011 Dollars -- 1.203(ADEQ provided for 2009)*1.009*1.011; Adjusted Laboratory Costs to 2011 by 1.011 from 2010. Disposal Cost in 2011 dollars
61	Engineering and Certification Services	Lump	1		$ 166,908	15 % of Subtotaled Closure Costs	Includes the cost of engineer certification.
62	Contingency (20%)				$ 255,925	20% of Subtotaled Closure Costs and Engineering Costs	
63	**Total Closure Costs (2012 Dollars)**				**$1,535,550**		

12. FINANCIAL ASSURANCE

Heritage has established a performance bond as the financial assurance mechanism for facility closure in accordance with 40 CFR Part 264.143(d). A standby trust agreement is established in accordance with 40 CFR Part 264.143(d)(3).

The closure cost estimate will be modified within 30 days after a revision has been made to the closure plan which increases the cost of closure as required at 40 CFR Part 254.142(c). The total closure cost estimate will be updated annually according to the guidelines provide at 40 CFR Part 264.142(b). A copy of the original performance bond and standby trust agreement are provided in Appendix G-C.

APPENDIX G-A

ANTICIPATED CLOSURE SCHEDULE

ANTICIPATED FINAL CLOSURE SCHEDULE
HERITAGE ENVIRONMENTAL SERVICES, LLC
COOLIDGE, ARIZONA

Task	Days																		
	0	15	30	45	60	75	90	105	120	135	150	165	180	195	210	225	240	255	270
1. Notification to ADEQ of intent to close	■																		
2. Receipt of final volume of waste	■	■	■																
3. Remove waste in storage				■	■	■	■	■	■										
4. Decontaminate permitted area						■	■	■	■	■									
5. Sample, analyze, and dispose of decontamination fluids									■	■	■	■							
6. Perform verification sampling and analysis									■	■	■	■							
7. Conduct soil borings, sample & analyze, if necessary									■	■	■	■							
8. Excavation & disposal of contaminated soil, if necessary											■	■	■						
9. Complete closure activities											■	■	■	■	■				
10.Submit certification of closure to ADEQ																			■

APPENDIX G-B

CLOSURE CERTIFICATION STATEMENT

Closure Certification Statement

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

US EPA ID Number: AZD 081 705 402

Heritage Environmental Services, LLC

_____	_____	_____
Signature of Responsible Officer	Title	Date

_____	_____	_____
Signature of Registered P.E.	Registration Number	Date

APPENDIX G-C

FINANCIAL ASSURANCE DOCUMENTATION

Performance Bond

Date bond executed: **SEPTEMBER 11, 2014**

Effective date: **SEPTEMBER 11, 2014**

Principal: **HERITAGE ENVIRONMENTAL SERVICES, LLC**
7901 WEST MORRIS STREET
INDIANAPOLIS, IN 46231

Type of organization: **LIMITED LIABILITY COMPANY**

State of organization: **INDIANA**

Surety(ies): **LEXON INSURANCE COMPANY**
10002 SHELBYVILLE RD., SUITE 100
LOUISVILLE, KY 40223

EPA identification number, name, address, and closure and/or post-closure amount(s) for each facility guaranteed by this bond:

HERITAGE ENVIRONMENTAL SERVICES, LLC
284 EAST STOREY ROAD
COOLIDGE, AZ 85128

EPA Identification Number **AZD 081 705 402**
Closure Amount: **$1,393,429.00**
Post-Closure Amount: **$0.00**

Total penal sum of bond: **$1,393,429.00**

Surety's bond number: **1101557**

Know All Persons By These Presents, That we, the Principal and Surety(ies) hereto are firmly bound to the Arizona Department of Environmental Quality (hereinafter called ADEQ) an agency of the State of Arizona, in the above penal sum for the payment of which we bind ourselves, our heirs, executors, administrators, successors, and assigns jointly and severally; provided that, where the Surety(ies) are corporations acting as co-sureties, we, the Sureties, bind ourselves in such sum "jointly and severally" only for the purpose of allowing a joint action or actions against any or all of us, and for all other purposes each Surety binds itself, jointly and severally with the Principal, for the payment of such sum only as is set forth opposite the name of such Surety, but if no limit of liability is indicated, the limit of liability shall be the full amount of the penal sum.

Whereas said Principal is required, under the Resource Conservation and Recovery Act as amended (RCRA), to have a permit in order to own or operate each hazardous waste management facility identified above, and

Whereas said Principal is required to provide financial assurance for closure, or closure and post-closure care, as a condition of the permit, and

Whereas said Principal shall establish a standby trust fund as is required when a surety bond is used to provide such financial assurance;

Now, Therefore, the conditions of this obligation are such that if the Principal shall faithfully perform closure, whenever required to do so, of each facility for which this bond guarantees closure, in accordance with the closure plan and other requirements of the permit as such plan and permit may be amended, pursuant to all applicable laws, statutes, rules, and regulations, as such laws, statutes, rules, and regulations may be amended.

And, if the Principal shall faithfully perform post-closure care of each facility for which this bond guarantees post-closure care, in accordance with the post-closure plan and other requirements of the permit, as such plan and permit may be amended, pursuant to all applicable laws, statutes, rules, and regulations, as such laws, statutes, rules, and regulations may be amended,

Or, if the Principal shall provide alternate financial assurance as specified in Subpart H of 40 CFR Part 264, and obtain the Director of the ADEQ's written approval of such assurance, within 90 days after the date notice of cancellation is received by both the Principal and the Director of the ADEQ from the Surety(ies), then this obligation shall be null and void, otherwise it is to remain in full force and effect.

The Surety(ies) shall become liable on this bond obligation only when the Principal has failed to fulfill the conditions described above.

Upon notification by the Director of the ADEQ that the Principal has been found in violation of the closure requirements of 40 CFR Part 264, for a facility for which this bond guarantees performance of closure, the Surety(ies) shall either perform closure in accordance with the closure plan and other permit requirements or place the closure amount guaranteed for the facility into the standby trust fund as directed by the Director of the ADEQ.

Upon notification by the Director of the ADEQ that the Principal has been found in violation of the post-closure requirements of 40 CFR Part 264 for a facility for which this bond guarantees performance of post-closure care, the Surety(ies) shall either perform post-closure care in accordance with the post-closure plan and other permit requirements or place the post-closure amount guaranteed for the facility into the standby trust fund as directed by the Director of the ADEQ.

Upon notification by the Director of the ADEQ that the Principal has failed to provide alternate financial assurance as specified in Subpart H of 40 CFR Part 264, and obtain written approval of such assurance from the Director of the ADEQ during the 90 days following receipt by both the Principal and the Director of the ADEQ of a notice of cancellation of the bond, the Surety(ies) shall place funds in the amount guaranteed for the facility(ies) into the standby trust fund as directed by the Director of the ADEQ.

The surety(ies) hereby waive(s) notification of amendments to closure plans, permits, applicable laws, statutes, rules, and regulations and agrees that no such amendment shall in any way alleviate its (their) obligation on this bond.

The liability of the Surety(ies) shall not be discharged by any payment or succession of payments hereunder, unless and until such payment or payments shall amount in the aggregate to the penal sum of the bond, but in no event shall the obligation of the Surety(ies) hereunder exceed the amount of said penal sum.

The Surety(ies) may cancel the bond by sending notice of cancellation by certified mail to the owner or operator and to the Director of the ADEQ, provided, however, that cancellation shall not occur during the 120 days beginning on the date of receipt of the notice of cancellation by both the Principal and the Director of the ADEQ, as evidenced by the return receipts.

The principal may terminate this bond by sending written notice to the Surety(ies), provided, however, that no such notice shall become effective until the Surety(ies) receive(s) written authorization for termination of the bond by the Director of the ADEQ .

Principal and Surety(ies) hereby agree to adjust the penal sum of the bond yearly so that it guarantees a new closure and/or post-closure amount, provided that the penal sum does not increase by more than 20 percent in any one year, and no decrease in the penal sum takes place without the written permission of the Director of the ADEQ .

In Witness Whereof, The Principal and Surety(ies) have executed this Performance Bond and have affixed their seals on the date set forth above.

The persons whose signatures appear below hereby certify that they are authorized to execute this surety bond on behalf of the Principal and Surety(ies) and that the wording of this surety bond is identical to the wording specified in 40 CFR 264.151(c) as such regulation was constituted on the date this bond was executed.

Principal

HERITAGE ENVIRONMENTAL SERVICES, LLC

Signature(s)

JEFF LABORSKY

Name(s)

PRESIDENT

Title(s)

Corporate seal

Corporate Surety(ies)

LEXON INSURANCE COMPANY
10002 SHELBYVILLE RD., SUITE 100
LOUISVILLE, KY 40223
Name and address

State of incorporation: **TEXAS**

Liability limit: $ **1,393,429.00**

Signature(s)

ROBERT M. RUTIGLIANO, ATTORNEY-IN-FACT
Name(s) and title(s)

Corporate seal

Bond premium: $ **18,115.00**

POWER OF ATTORNEY LX-210555

Lexon Insurance Company

KNOW ALL MEN BY THESE PRESENTS, that **LEXON INSURANCE COMPANY**, a Texas Corporation, with its principal office in Louisville, Kentucky, does hereby constitute and appoint: Nick J. Rutigliano, Robert M. Rutigliano, Eric M. Wahlstrom*******

****

its true and lawful Attorney(s)-In-Fact to make, execute, seal and deliver for, and on its behalf as surety, any and all bonds, undertakings or other writings obligatory in nature of a bond.

This authority is made under and by the authority of a resolution which was passed by the Board of Directors of **LEXON INSURANCE COMPANY** on the 1st day of July, 2003 as follows:

Resolved, that the President of the Company is hereby authorized to appoint and empower any representative of the Company or other person or persons as Attorney-In-Fact to execute on behalf of the Company any bonds, undertakings, policies, contracts of indemnity or other writings obligatory in nature of a bond not to exceed $5,000,000.00 Five Million********** dollars, which the Company might execute through its duly elected officers, and affix the seal of the Company thereto. Any said execution of such documents by an Attorney-In-Fact shall be as binding upon the Company as if they had been duly executed and acknowledged by the regularly elected officers of the Company. Any Attorney-In-Fact, so appointed, may be removed for good cause and the authority so granted may be revoked as specified in the Power of Attorney.

Resolved, that the signature of the President and the seal of the Company may be affixed by facsimile on any power of attorney granted, and the signature of the Assistant Secretary, and the seal of the Company may be affixed by facsimile to any certificate of any such power and any such power or certificate bearing such facsimile signature and seal shall be valid and binding on the Company. Any such power so executed and sealed and certificate so executed and sealed shall, with respect to any bond of undertaking to which it is attached, continue to be valid and binding on the Company.

IN WITNESS THEREOF, **LEXON INSURANCE COMPANY** has caused this instrument to be signed by its President, and its Corporate Seal to be affixed this 21st day of September, 2009.

LEXON INSURANCE COMPANY CORPORATE SEAL STATE OF TEXAS MARCH 16, 1954

LEXON INSURANCE COMPANY

BY _____
David E. Campbell
President

ACKNOWLEDGEMENT

On this 21st day of September, 2009, before me, personally came David E. Campbell to me known, who be duly sworn, did depose and say that he is the President of **LEXON INSURANCE COMPANY**, the corporation described in and which executed the above instrument; that he executed said instrument on behalf of the corporation by authority of his office under the By-laws of said corporation.

AMY TAYLOR NOTARY PUBLIC STATE OF TENNESSEE DAVIDSON COUNTY

AMY L. TAYLOR
Notary Public- State of Tennessee
Davidson County
My Commission Expires 01-09-16

BY _____
Amy L. Taylor
Notary Public

CERTIFICATE

I, the undersigned, Assistant Secretary of **LEXON INSURANCE COMPANY**, A Texas Insurance Company, DO HEREBY CERTIFY that the original Power of Attorney of which the forgoing is a true and correct copy, is in full force and effect and has not been revoked and the resolutions as set forth are now in force.

Signed and Seal at Mount Juliet, Tennessee this 11TH Day of SEPTEMBER, 2014.

LEXON INSURANCE COMPANY CORPORATE SEAL STATE OF TEXAS MARCH 16, 1954

BY _____
Andrew Smith
Assistant Secretary

"WARNING: Any person who knowingly and with intent to defraud any insurance company or other person, files and application for insurance of claim containing any materially false information, or conceals for the purpose of misleading, information concerning any fact material thereto, commits a fraudulent insurance act, which is a crime and subjects such person to criminal and civil penalties."

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TRUST AGREEMENT

Trust Agreement, the "Agreement," entered into as of December 12, 2013 by and between Heritage Environmental Services, LLC an Indiana Limited Liability Company, the "Grantor," and Wells Fargo Bank, National Association, a national banking association, the "Trustee."

Whereas, the Arizona Department of Environmental Quality, "ADEQ," an agency of the State of Arizona, has established certain regulations applicable to the Grantor, requiring that an owner or operator of a hazardous waste management facility shall provide assurance that funds will be available when needed for closure and/or post-closure care of the facility.

Whereas, the Grantor has elected to establish a trust to provide all or part of such financial assurance for the facilities identified herein.

Whereas, the Grantor, acting through its duly authorized officers, has selected the Trustee to be the Trustee under this Agreement, and the Trustee is willing to act as Trustee.

Now, therefore, the Grantor and the Trustee agree as follows:

Section 1. Definitions. As used in this Agreement:

(a) The term "Grantor" means the owner or operator who enters into this Agreement and any successors or assigns of the Grantor.

(b) The term "Trustee" means the Trustee who enters into this Agreement and any successor Trustee.

Section 2. Identification of Facilities and Cost Estimates. This Agreement pertains to the facilities and cost estimates identified on attached Schedule A.

Section 3. Establishment of Fund. The Grantor and the Trustee hereby establish a trust fund, the "Fund," for the benefit of ADEQ. The Grantor and the Trustee intend that no third party have access to the Fund except as herein provided. The Fund is established initially as consisting of the property, which is acceptable to the Trustee, described in Schedule B attached hereto. Such property and any other property subsequently transferred to the Trustee is referred to as the Fund, together with all earnings and profits thereon, less any payments or distributions made by the Trustee pursuant to this Agreement. The Fund shall be held by the Trustee, **IN TRUST**, as hereinafter provided. The Trustee shall not be responsible nor shall it undertake any responsibility for the amount or adequacy of, nor any duty to collect from the Grantor, any payments necessary to discharge any liabilities of the Grantor established by the ADEQ.

Section 4. Payment for Closure and Post-Closure Care. The Trustee shall make payments from the Fund as the ADEQ Director shall direct, in writing, to provide for the payment of the costs of closure and/or post-closure care of the facilities covered by this Agreement. The Trustee shall reimburse the Grantor or other persons as specified by the ADEQ Director from the Fund for closure and post-closure expenditures in such amounts as the ADEQ Director shall direct in writing. In addition, the Trustee shall refund to the Grantor such amounts as the ADEQ Director specifies in writing. Upon refund, such funds shall no longer constitute part of the Fund as defined herein.

Section 5. Payments Comprising the Fund. Payments made to the Trustee for the Fund shall consist of cash or securities acceptable to the Trustee.

Section 6. Trustee Management. The Trustee shall invest and reinvest the principal and income of the Fund and keep the Fund invested as a single fund, without distinction between principal and income, in accordance with general investment policies and guidelines which the Grantor may communicate in writing to the Trustee from time to time, subject, however, to the provisions of this Section. In investing, reinvesting, exchanging, selling, and managing the Fund, the Trustee shall discharge his duties with respect to the trust fund solely in the interest of the beneficiary and with the care, skill, prudence, and diligence under the circumstances then prevailing which persons of prudence, acting in a like capacity and familiar with such matters, would use in the conduct of an enterprise of a like character and with like aims; except that:

(a) Securities or other obligations of the Grantor, or any other owner or operator of the facilities, or any of their affiliates as defined in the Investment Company Act of 1940, as amended, 15 U.S.C. 80a–2.(a), shall not be acquired or held, unless they are securities or other obligations of the Federal or State government;

(b) The Trustee is authorized to invest the Fund in time or demand deposits of the Trustee, to the extent insured by an agency of the Federal or State government; and

(c) The Trustee is authorized to hold cash awaiting investment or distribution uninvested for a reasonable time and without liability for the payment of interest thereon.

Section 7. Commingling and Investment. The Trustee is expressly authorized in its discretion:

(a) To transfer from time to time any or all of the assets of the Fund to any common, commingled, or collective trust fund created by the Trustee in which the Fund is eligible to participate, subject to all of the provisions thereof, to be commingled with the assets of other trusts participating herein; and

(b) To purchase shares in any investment company registered under the Investment Company Act of 1940, 15 U.S.C. 80a–1 et seq., including one which may be created, managed, underwritten, or to which investment advice is rendered or the shares of which are sold by the Trustee. The Trustee may vote such shares in its discretion.

Section 8. Express Powers of Trustee. Without in any way limiting the powers and discretions conferred upon the Trustee by the other provisions of this Agreement or by law, the Trustee is expressly authorized and empowered:

(a) To sell, exchange, convey, transfer, or otherwise dispose of any property held by it, by public or private sale. No person dealing with the Trustee shall be bound to see to the application of the purchase money or to inquire into the validity or expediency of any such sale or other disposition;

(b) To make, execute, acknowledge, and deliver any and all documents of transfer and conveyance and any and all other instruments that may be necessary or appropriate to carry out the powers herein granted;

(c) To register any securities held in the Fund in its own name or in the name of a nominee and to hold any security in bearer form or in book entry, or to combine certificates representing such securities with certificates of the same issue held by the Trustee in any other fiduciary capacity, or to deposit or arrange for the deposit of such securities in a qualified central depositary even though, when so deposited, such securities may be merged and held in bulk in the name of the nominee of such depositary with other securities deposited therein by another person, or to deposit or arrange for the deposit of any securities issued by the United States Government, or any agency or instrumentality thereof, with a Federal Reserve bank, but the books and records of the Trustee shall at all times show that all such securities are part of the Fund;

(d) To deposit any cash in the Fund in interest-bearing accounts maintained or savings certificates issued by the Trustee, in its separate corporate capacity, or in any other banking institution affiliated with the Trustee, to the extent insured by an agency of the Federal or State government; and

(e) To compromise or otherwise adjust all claims in favor of or against the Fund.

Section 9. Taxes and Expenses. All taxes of any kind that may be assessed or levied against or in respect of the Fund and all brokerage commissions incurred by the Fund shall be paid from the Fund. All other expenses incurred by the Trustee in connection with the administration of this Trust, including fees for legal services rendered to the Trustee, the compensation of the Trustee to the extent not paid directly by the Grantor, and all other proper charges and disbursements of the Trustee shall be paid from the Fund.

Section 10. Annual Valuation. The Trustee shall annually, at least thirty (30) days prior to the anniversary date of establishment of the Fund, furnish to the Grantor and to the ADEQ Director a statement confirming the value of the Trust. Any securities in the Fund shall be valued at market value as of no more than sixty (60) days prior to the anniversary date of establishment of the Fund. The failure of the Grantor to object in writing to the Trustee within ninety (90) days after the statement has been furnished to the Grantor and the ADEQ Director shall constitute a conclusively binding assent by the Grantor, barring the Grantor from asserting any claim or liability against the Trustee with respect to matters disclosed in the statement.

Section 11. Advice of Counsel. The Trustee may from time to time consult with counsel, who may be counsel to the Grantor, with respect to any question arising as to the construction of this Agreement or any action to be taken hereunder. The Trustee shall be fully protected, to the extent permitted by law, in acting upon the advice of counsel.

Section 12. Trustee Compensation. The Trustee shall be entitled to reasonable compensation for its services as agreed upon in writing from time to time with the Grantor.

Section 13. Successor Trustee. The Trustee may resign or the Grantor may replace the Trustee, but such resignation or replacement shall not be effective until the Grantor has appointed a successor Trustee and this successor accepts the appointment. The successor Trustee shall have the same powers and duties as those conferred upon the Trustee hereunder. Upon the successor Trustee's acceptance of the appointment, the Trustee shall assign, transfer, and pay over to the successor Trustee the funds and properties then constituting the Fund. If for any reason the Grantor cannot or does not act in the event of the resignation of the Trustee, the Trustee may apply to a court of competent jurisdiction for the appointment of a successor trustee or for instructions. The successor Trustee shall specify the date on

which it assumes administration of the trust in writing sent to the Grantor, the ADEQ Director, and the present Trustee by certified mail ten (10) days before such change becomes effective. Any expenses incurred by the Trustee as a result of any of the acts contemplated by this section shall be paid as provided in Section 9.

Section 14. Instructions to the Trustee. All orders, requests, and instructions by the Grantor to the Trustee shall be in writing, signed by such persons as are designated in the attached Exhibit A or such other designees as the Grantor may designate by amendment to Exhibit A. The Trustee shall be fully protected in acting without inquiry in accordance with the Grantor's orders, requests, and instructions. All orders, requests, and instructions by the ADEQ Director to the Trustee shall be in writing, signed by the ADEQ Director, or a designee of the ADEQ Director, and the Trustee shall act and shall be fully protected in acting in accordance with such orders, requests, and instructions. The Trustee shall have the right to assume, in the absence of written notice to the contrary, that no event constituting a change or a termination of the authority of any person to act on behalf of the Grantor or ADEQ hereunder has occurred. The Trustee shall have no duty to act in the absence of such orders, requests, and instructions from the Grantor and/or ADEQ, except as provided for herein.

Section 15. Notice of Nonpayment. The Trustee shall notify the Grantor and the ADEQ Director, by certified mail within ten (10) days following the expiration of the thirty (30) day period after the anniversary of the establishment of the trust, if no payment is received from the Grantor during that period. After the pay-in period is completed, the Trustee shall not be required to see a notice of nonpayment.

Section 16. Amendment of Agreement. This Agreement may be amended by an instrument in writing executed by the Grantor, the Trustee, and the ADEQ Director, or by the Trustee and the ADEQ Director if the Grantor ceases to exist.

Section 17. Irrevocability and Termination. Subject to the right of the parties to amend this Agreement as provided in Section 16, this Trust shall be irrevocable and shall continue until terminated at the written agreement of the Grantor, the Trustee, and the ADEQ Director, or by the Trustee and the ADEQ Director, if the Grantor ceases to exist. Upon termination of the Trust, all remaining trust property, less final trust administration expenses, shall be delivered to the Grantor.

Section 18. Immunity and Indemnification. The Trustee shall not incur personal liability of any nature in connection with any act or omission, made in good faith, in the administration of this Trust, or in carrying out any directions by the Grantor or the ADEQ Director issued in accordance with this Agreement. The Trustee shall be indemnified and saved harmless by the Grantor or from the Trust Fund, or both, from and against any personal liability to which the Trustee may be subjected by reason of any act or conduct in its official capacity, including all expenses reasonably incurred in its defense in the event the Grantor fails to provide such defense.

Section 19. Choice of Law. This Agreement shall be administered, construed, and enforced according to the laws of the State of Arizona.

Section 20. Interpretation. As used in this Agreement, words in the singular include the plural and words in the plural include the singular. The descriptive headings for each Section of this Agreement shall not affect the interpretation or the legal efficacy of this Agreement.

In Witness Whereof the parties have caused this Agreement to be executed by their respective officers duly authorized and their corporate seals to be hereunto affixed and attested as of the date first above written. The parties below certify that the wording of this Agreement is identical to the wording specified in 40 CFR 264.151(a)(1) as such regulations were constituted on the date first above written.

Signature of Grantor
Grantor – Jeffrey Laborsky
Title – President

[Seal]

Attest:

Signature
Title - DIRECTOR OF SAFETY & SAFETY

[Seal]

Connie Feltenberger

Signature of Trustee
Trustee: Connie Feltenberger, Wells Fargo Bank, National Association

Title - Authorized Officer

[Seal]

Attest:

Signature TIMOTHY P. MARTIN
Title – Vice President

[Seal]

13CH4062_I18

State of: Indiana

County of: Marion

On this 13th day of December, 2013, before me personally came Jeffrey Laborsky to me known, who, being by me duly sworn, did depose and say that he resides in Indiana; that he is President of Heritage Environmental Services, LLC, the corporation described in and which executed the above instrument; that he knows the seal of said corporation; that the seal affixed to such instrument is such corporate seal; that it was so affixed by order of the Board of Directors of said corporation; and that he signed his name thereto by like order.

IN WITNESS WHEREOF, I have set my hand and official seal this 13th day of December, 2013.

CARALYN K. CLARK
Notary Public, State of Indiana
Marion County
My Commission Expires
November 07, 2017

Caralyn K Clark
Signature of Notary Public

My Commission Expires: Nov. 7, 2017

My County of Residence is Marion

13CH4062_I18

SCHEDULE A

IDENTIFICATION OF FACILITY AND CLOSURE COST ESTIMATE

NAME OF FACILITY:	Heritage Environmental Services, LLC
ADDRESS OF FACILITY:	284 East Storey Road Coolidge, Arizona 85128
EPA IDENTIFICATION NO.:	AZD 081 705 402
CURRENT CLOSURE COST ESTIMATE:	$ 1,393,429
DATE OF ESTIMATE:	December 2013
LETTER OF CREDIT NUMBER:	SC7000256W
BANK:	Wells Fargo Bank, N.A.

13CH4062_I18

SCHEDULE B

PROPERTY INITIALLY CONSTITUTING THE FUND

The Fund initially shall be unfunded and consist of no property. In the future the Fund may consist of the drawn proceeds from Letter of Credit No. SC7000256W dated November 2, 2011 issued by Wells Fargo Bank, N.A. to ADEQ as the Beneficiary and actually deposited by ADEQ with the Trustee.

Current face amount of Letter of Credit No. SC7000256W: $ 1,393,429

13CH4062_I18

EXHIBIT A

GRANTOR'S DESIGNEES FOR SIGNING WRITTEN INSTRUCTIONS TO TRUSTEE

NAME	SPECIMEN SIGNATURE
Jeffery Laborsky, President	
Deborah Edwards, Vice President	
Jeffrey Baetzel, Vice President	
Winde Hamrick, Vice President	

Telephone Number(s) for Call-Backs and Person(s) Designated to Confirm Funds Transfer Instructions

If to Grantor:

Name	Title	Signature	Telephone Number
Cindy Reed	Cash Mgmt. Supervisor		317/228-8326
David Franz	Asst. Controller		317/228-8331

13CH4062_I18

AMENDMENT 001 - TRUST AGREEMENT

THIS Amendment 001 made and entered into this 11th day of September 2014 amends that certain "Trust Agreement" dated December 12, 2013 by and between Heritage Environmental Services, LLC, as "Grantor", and Wells Fargo Bank, National Association, a national banking association as "Trustee," in the following particulars:

1. Grantor's Schedule A is hereby replaced with the attached Amendment 001 Schedule A

2. Grantor's Schedule B is hereby replaced with the attached Amendment 001 Schedule B

4. All terms and conditions of the Trust Agreement, except as amended hereby, shall remain in full force and effect.

DATED the day and year first above written.

Signature of Grantor
Heritage Environmental Services, LLC
Jeffrey Laborsky
President

Attest:

Accepted and Acknowledged on

by: Connie Feltenberger
Signature of Trustee
Wells Fargo Bank, National Association
Connie Feltenberger
Authorized Officer

Attest:

14CH3025_I18

State of Indiana)
) SS:
County of Marion)

"On this day September 11, 2014 before me personally came Jeffrey Laborsky to me known, who, being by me duly sworn, did depose and say that he resides in Indianapolis, Indiana that he is a President of Heritage Environmental Services, LLC, the corporation described in and which executed the above instrument; that he knows the seal of said corporation, that the seal affixed to such instrument is such corporate seal; that it was affixed by order of the Board of Directors of said corporation, and that he signed his name thereto by like order.

Notary Public

My Commission Expires: 4-20-22

My county of residence is: Johnson

14CH3025_I18

AMENDMENT 001 - SCHEDULE A
IDENTIFICATION OF FACILITY AND CLOSURE COST ESTIMATE

NAME OF FACILITY:	Heritage Environmental Services, LLC
ADDRESS OF FACILITY:	284 East Storey Road Coolidge, Arizona 85128
EPA IDENTIFICATION NO.:	AZD 081 705 402
CURRENT CLOSURE COST ESTIMATE:	$ 1,393,429
DATE OF ESTIMATE:	December 2013
SURETY BOND NUMBER:	1101557
SURETY COMPANY:	Lexon Insurance Company

14CH3025_I18

AMENDMENT 001 SCHEDULE B
PROPERTY INITIALLY CONSTITUTING THE FUND

Account Information for the issuing institution for this standby trust agreement:

Wells Fargo Bank, National Association
10 South Wacker Drive
13th Floor
Chicago, IL 60606

Account Number 46654500

Contact information for Bank who will be responsible for information/questions regarding this standby trust agreement:

Name:	Connie Feltenberger
Title	Corporate, Municipal and Escrow Solutions
Telephone:	(312) 920-9179

The Fund initially shall be unfunded and consist of no property. In the future the Fund may consist of the drawn proceeds from Surety Bond(s) issued by Lexon Insurance Company as follows:

Lexon Insurance Company
10002 Shelbyville Road, Suite 100
Louisville, Kentucky 40223

Current Face Value of Surety

Surety Number	Facility Name	Closure and/or Post Closure Amount
1101557	Heritage Environmental Services, LLC Coolidge Arizona Facility	$ 1,393,429

14CH3025_I18

APPENDIX G-D

QUALITY ASSURANCE PROJECT PLAN

QUALITY ASSURANCE PROJECT PLAN
FOR FACILITY RCRA CLOSURE PLAN

HERITAGE ENVIRONMENTAL SERVICES, LLC
COOLIDGE, ARIZONA

USEPA IDENTIFICATION NUMBER
AZD 081 705 402

TABLE OF CONTENTS

1. PROJECT DESCRIPTION

The following sections provide background information for the Resource Conservation and Recovery Act (RCRA) Closure Plan prepared for the Heritage Environmental Services, LLC ("Heritage") facility in Coolidge, Arizona.

1.1. Introduction

This Quality Assurance Project Plan (QAPP) was prepared to ensure that data gathered during analysis of concrete and soil samples specified in the Closure Plan are properly documented, meet specified data quality goals, and document those procedures or methods that will be utilized during implementation of the Closure Plan at the Heritage facility. The Closure Plan and this QAPP were prepared as parts of the RCRA Part B permit renewal application for the Heritage facility.

1.1.1. Overall Project Objectives

The primary objective of the Closure Plan is to establish procedures to close hazardous waste management units at the Heritage facility in accordance with the closure performance standard stated in Section 3.3 of the Closure Plan.

The Closure Plan requires sampling and analysis of concrete and underlying soils to verify concentrations of the constituents of concern are below levels of regulatory concern. These samples will be collected and analyzed in accordance with the Closure Plan and this QAPP. Sample results will be compared with the action levels specified in the Closure Plan and this QAPP.

1.1.2. QAPP Preparation Guidelines

Heritage has prepared this QAPP based on guidance provided in: Shupp, G. C., 1993, Model RCRA Quality Assurance Project Plans (QAPP) - Revision 1, USEPA Region 5 Environmental Sciences Division, Monitoring and Quality Assurance Branch, Quality Assurance Section.

The Closure Plan and QAPP are interrelated documents and often support one another with specific details. An Arizona Department of Health Services (ADHS)-licensed laboratory selected at the time of closure will implement a Quality Assurance Plan (QAP) and standard operating procedures (SOPs) that also support this QAPP. The ADHS-licensed laboratory will perform the analytical methods specified in this QAPP and their established quality assurance/quality control (QA/QC) procedures in accordance with the current versions of the selected ADHS-licensed laboratory's QAP and SOPs at the time of closure. During an actual closure event, the QAP in effect at the time of closure for the selected ADHS-licensed laboratory will be utilized by the testing laboratory.

1.2. Site Description/Facility Description

A brief description of the facility, its geological setting, and associated features are included in the Closure Plan and/or the RCRA Part B permit renewal application. The relevant sections of these documents are referenced in the following sections.

1.2.1. Location

A description of the facility location is provided in Section 2 of the Closure Plan.

1.2.2. Facility/Site Size and Borders

The facility property is approximately 88 acres with the facility occupying approximately 10 acres. Further information is provided in Section 2 of the Closure Plan.

1.2.3. Natural and Manmade Features

This information is addressed in Section B of the RCRA permit renewal application.

1.2.4. Topography

Site topography is addressed in Section B of the RCRA permit renewal application.

1.2.5. Local Geology and Hydrogeology

Local geology and hydrogeology are addressed in Section B of the RCRA permit renewal application.

1.3. Project Objectives and Use of Data

The primary objective of the Closure Plan is to establish procedures to close hazardous waste management units at the Heritage facility and to meet the requirements of the closure performance standard stated at 40 CFR 264.111, as incorporated by reference at AAC 18-8-264(A). To meet this objective, Heritage will perform the following:

- Collect data through sampling and analysis of concrete to verify that constituents of concern are below regulatory levels of concern, as specified in the Closure Plan;
- Collect data through sampling and analysis of underlying soils to verify that constituents of concern are below regulatory levels of concern, as specified in the Closure Plan;
- Collect data through sampling and analysis of underlying concrete or soil to define the extent of any environmental impact, as specified in the Closure Plan; and
- Collect data after any remediation efforts performed as part of closure to demonstrate that hazardous constituents are below levels that meet site-specific closure standards.

Data collected will be compiled and used to meet the appropriate objective(s) for each hazardous waste management unit undergoing closure. Heritage may also use these data for determining the requirements for proper disposal of any closure wastes. Table 1-1 summarizes the data quality objective levels, sample matrices, intended data usages, and parameters for the Closure Plan.

Hazardous waste management units at the Heritage facility include permitted container storage areas. A more detailed description of the facility including hazardous waste management units, hazardous waste management activities, and facility history are provided in the RCRA Part B permit.

To meet the above objectives, concrete samples will be collected and analyzed at each unit being closed, as described in the Closure Plan. In addition, soil samples will be collected and analyzed at final closure. Descriptions of specific sampling activities are provided in the Closure Plan. Section 4 of this QAPP describes procedures that will be followed during collection of samples. Section 7 of this QAPP outlines laboratory testing requirements for the closure.

1.4. Sampling Network and Rationale

The sampling network design and rationale is discussed in Section 7 of the Closure Plan. Section 7 of this QAPP specifies testing that will be performed and Section 4 describes procedures that will be utilized during sampling. In addition, Section 7 of the Closure Plan specifies sampling methods and rationale as well as sampling frequencies and locations. Figures 1-1, 1-2, 1-3, 1-4, 1-5, 1-6, and 1-7 identify the anticipated random sample locations for each of the unit(s) based on the selection criteria specified in Section 7 of the Closure Plan, including judgmental samples proposed for collection in sumps and trenches within the units designated for closure.

Background samples will be collected from a specified location at the facility that is not used for waste management operations. Additional information concerning background sampling is provided in Section 7 of the Closure Plan.

1.5. Project Schedule

As required by 40 CFR 264.112, as incorporated by reference at AAC 18-8-264(A), Heritage has prepared a proposed schedule for closure. This schedule is discussed in Section 8 of the Closure Plan.

Table G-1
Sample Matrices, Parameters, Intended Data Usages,
And Data Quality Objectives
Heritage Environmental Services, LLC
Coolidge, Arizona

Sample Matrix	Field and Laboratory Testing	General Description of Intended Data Usages	Data Quality Objective Level
Soil	Table 7-1 QAPP Table 7-2 QAPP Table 7-3 QAPP Table 7-4 QAPP	Presence/Absence of Indicator Parameters Below or Above Specified Clean Closure Levels at Final Closure Evaluate Extent of any Contamination Verify Cleanup Standards Following any Remediation Activities Waste Disposal Characterization Risk Assessments	See Section 9.3
Concrete	Table 7-1 QAPP Table 7-2 QAPP Table 7-3 QAPP Table 7-4 QAPP	Presence/Absence of Indicator Parameters Below or Above Specified Clean Closure Levels at Final Closure Evaluate Extent of any Contamination Verify Cleanup Standards Following any Remediation Activities Waste Disposal Characterization Risk Assessments	See Section 9.3

FIGURE G-1

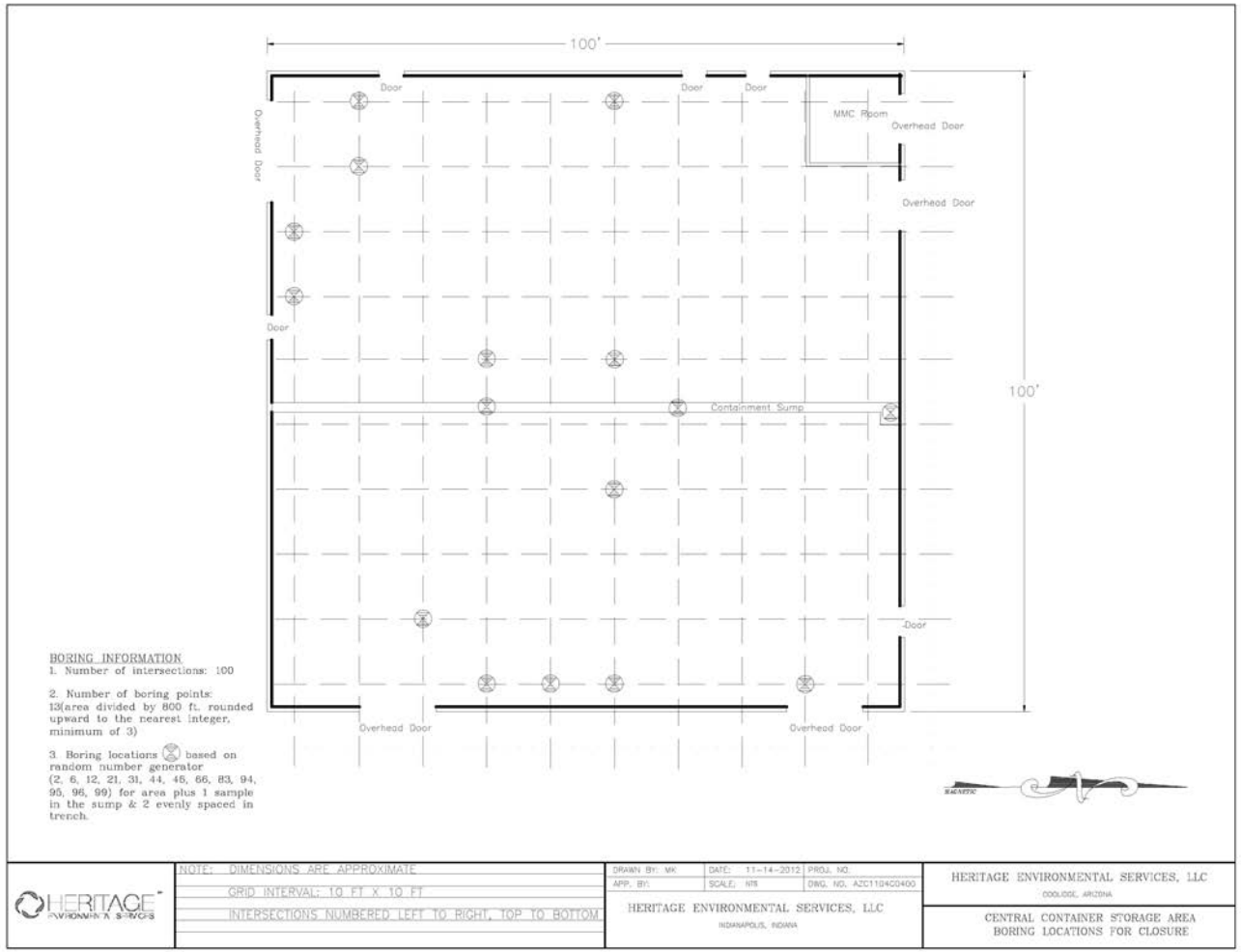

100'
Door
Door
Door
MMC Room
Overhead Door
Overhead Door
Overhead Door
Door
Containment Sump
100'
Door
Overhead Door
Overhead Door
BORING INFORMATION
1. Number of intersections: 100
2. Number of boring points: 13(area divided by 800 ft. rounded upward to the nearest integer, minimum of 3)
3. Boring locations based on random number generator (2, 6, 12, 21, 31, 44, 45, 66, 83, 94, 95, 96, 99) for area plus 1 sample in the sump & 2 evenly spaced in trench.
NOTE: DIMENSIONS ARE APPROXIMATE
GRID INTERVAL: 10 FT X 10 FT
INTERSECTIONS NUMBERED LEFT TO RIGHT, TOP TO BOTTOM
DRAWN BY: MK
DATE: 11-14-2012
PROJ. NO.
APP. BY:
SCALE: NTS
DWG. NO. AZC110400400
HERITAGE ENVIRONMENTAL SERVICES, LLC
INDIANAPOLIS, INDIANA
HERITAGE ENVIRONMENTAL SERVICES, LLC
COOLIDGE, ARIZONA
CENTRAL CONTAINER STORAGE AREA
BORING LOCATIONS FOR CLOSURE

FIGURE G-2

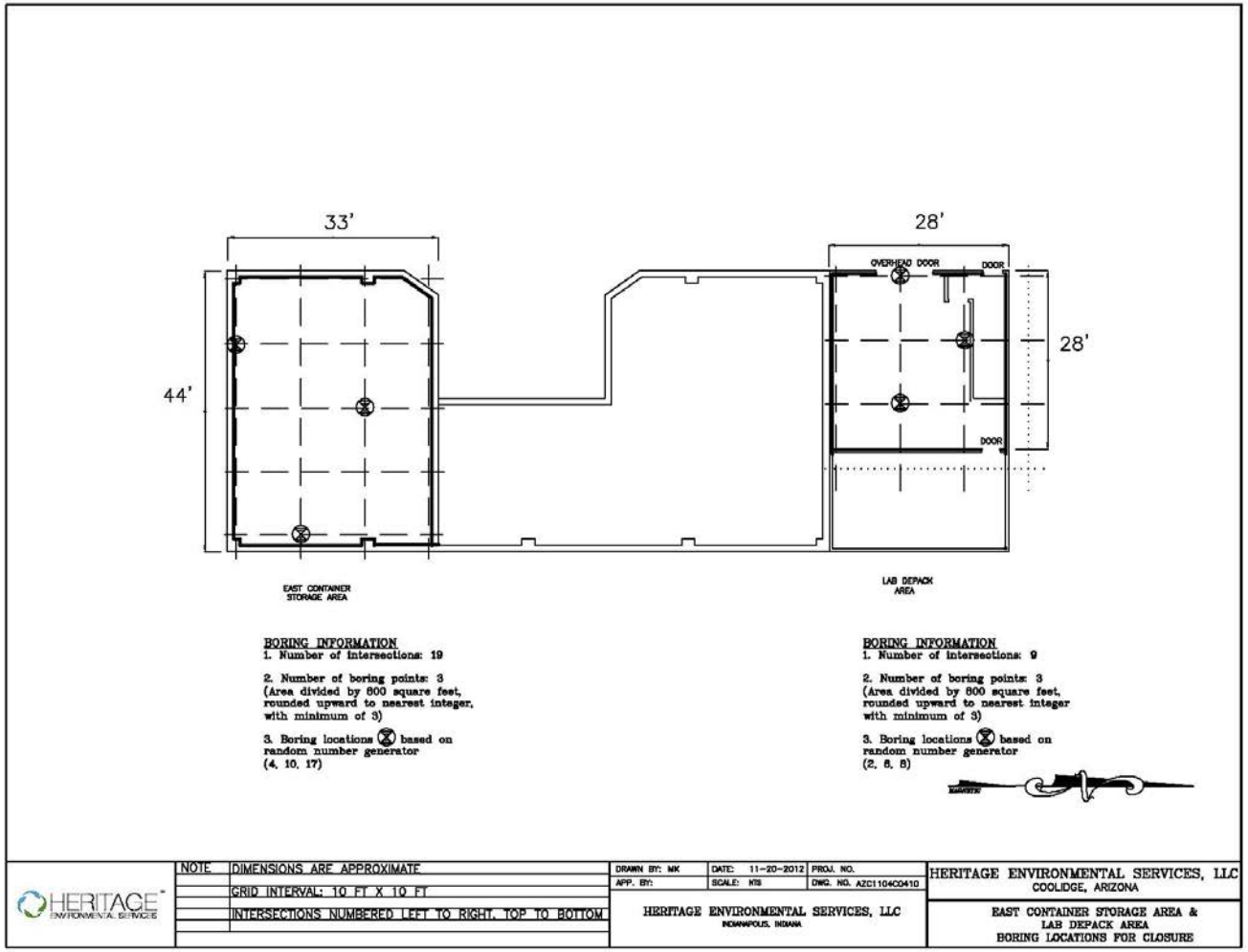

33'
28'
44'
28'
OVERHEAD DOOR
DOOR
DOOR
EAST CONTAINER STORAGE AREA
LAB DEPACK AREA
BORING INFORMATION
1. Number of intersections: 19
2. Number of boring points: 3 (Area divided by 800 square feet, rounded upward to nearest integer, with minimum of 3)
3. Boring locations ⊗ based on random number generator (4, 10, 17)
BORING INFORMATION
1. Number of intersections: 9
2. Number of boring points: 3 (Area divided by 800 square feet, rounded upward to nearest integer with minimum of 3)
3. Boring locations ⊗ based on random number generator (2, 6, 8)
NOTE
DIMENSIONS ARE APPROXIMATE
GRID INTERVAL: 10 FT X 10 FT
INTERSECTIONS NUMBERED LEFT TO RIGHT, TOP TO BOTTOM
DRAWN BY: MK
DATE: 11-20-2012
PROJ. NO.
APP. BY:
SCALE: NTS
DWG. NO. AZC1104C0410
HERITAGE ENVIRONMENTAL SERVICES, LLC
INDIANAPOLIS, INDIANA
HERITAGE ENVIRONMENTAL SERVICES, LLC
COOLIDGE, ARIZONA
EAST CONTAINER STORAGE AREA & LAB DEPACK AREA
BORING LOCATIONS FOR CLOSURE

FIGURE G-3

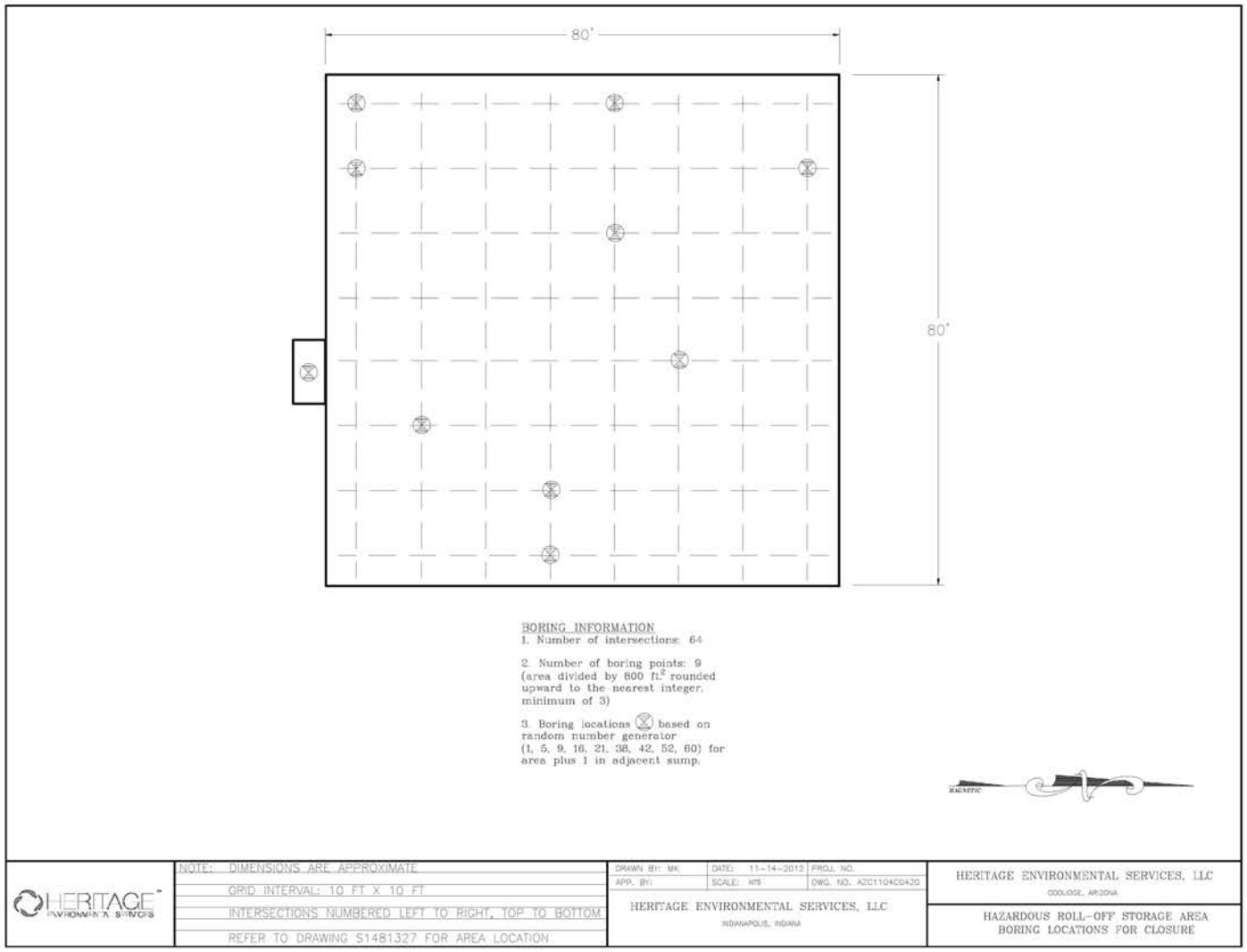

80'
80'
BORING INFORMATION
1. Number of intersections: 64
2. Number of boring points: 9 (area divided by 800 ft² rounded upward to the nearest integer, minimum of 3)
3. Boring locations ⊗ based on random number generator (1, 5, 9, 16, 21, 38, 42, 52, 60) for area plus 1 in adjacent sump.
MAGNETIC
HERITAGE ENVIRONMENTAL SERVICES
NOTE: DIMENSIONS ARE APPROXIMATE
GRID INTERVAL: 10 FT X 10 FT
INTERSECTIONS NUMBERED LEFT TO RIGHT, TOP TO BOTTOM
REFER TO DRAWING S1481327 FOR AREA LOCATION
DRAWN BY: MK
DATE: 11-14-2012
PROJ. NO.
APP. BY:
SCALE: NTS
DWG. NO. AZC1104C0420
HERITAGE ENVIRONMENTAL SERVICES, LLC
INDIANAPOLIS, INDIANA
HERITAGE ENVIRONMENTAL SERVICES, LLC
COOLIDGE, ARIZONA
HAZARDOUS ROLL-OFF STORAGE AREA
BORING LOCATIONS FOR CLOSURE

FIGURE G-4

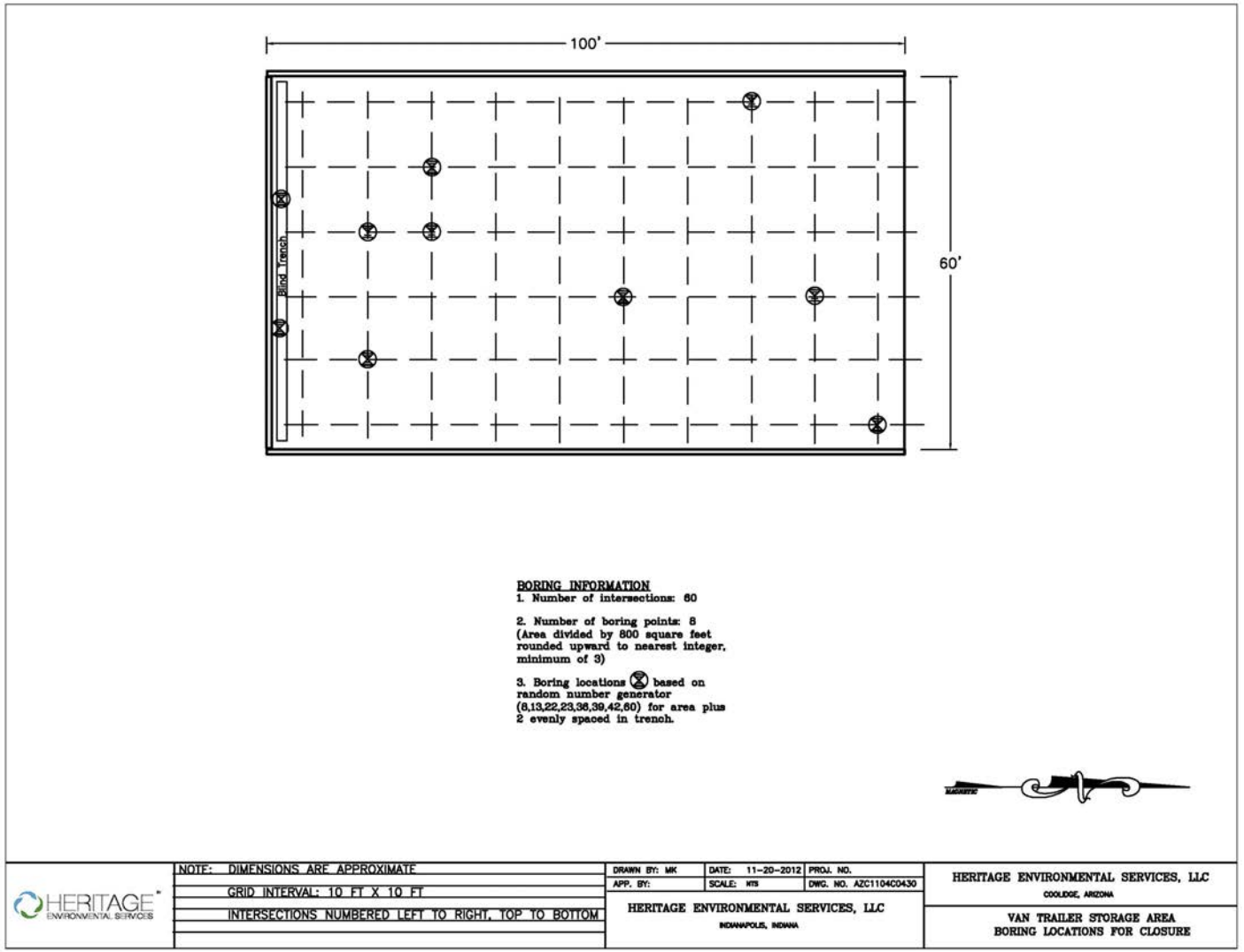

100'
60'
Filled Trench
BORING INFORMATION
1. Number of intersections: 60
2. Number of boring points: 8
(Area divided by 800 square feet
rounded upward to nearest integer,
minimum of 3)
3. Boring locations ⊗ based on
random number generator
(8,13,22,23,36,39,42,60) for area plus
2 evenly spaced in trench.
HERITAGE ENVIRONMENTAL SERVICES
NOTE: DIMENSIONS ARE APPROXIMATE
GRID INTERVAL: 10 FT X 10 FT
INTERSECTIONS NUMBERED LEFT TO RIGHT, TOP TO BOTTOM
DRAWN BY: MK
DATE: 11-20-2012
PROJ. NO.
APP. BY:
SCALE: NTS
DWG. NO. AZC1104C0430
HERITAGE ENVIRONMENTAL SERVICES, LLC
INDIANAPOLIS, INDIANA
HERITAGE ENVIRONMENTAL SERVICES, LLC
COOLIDGE, ARIZONA
VAN TRAILER STORAGE AREA
BORING LOCATIONS FOR CLOSURE

FIGURE G-5

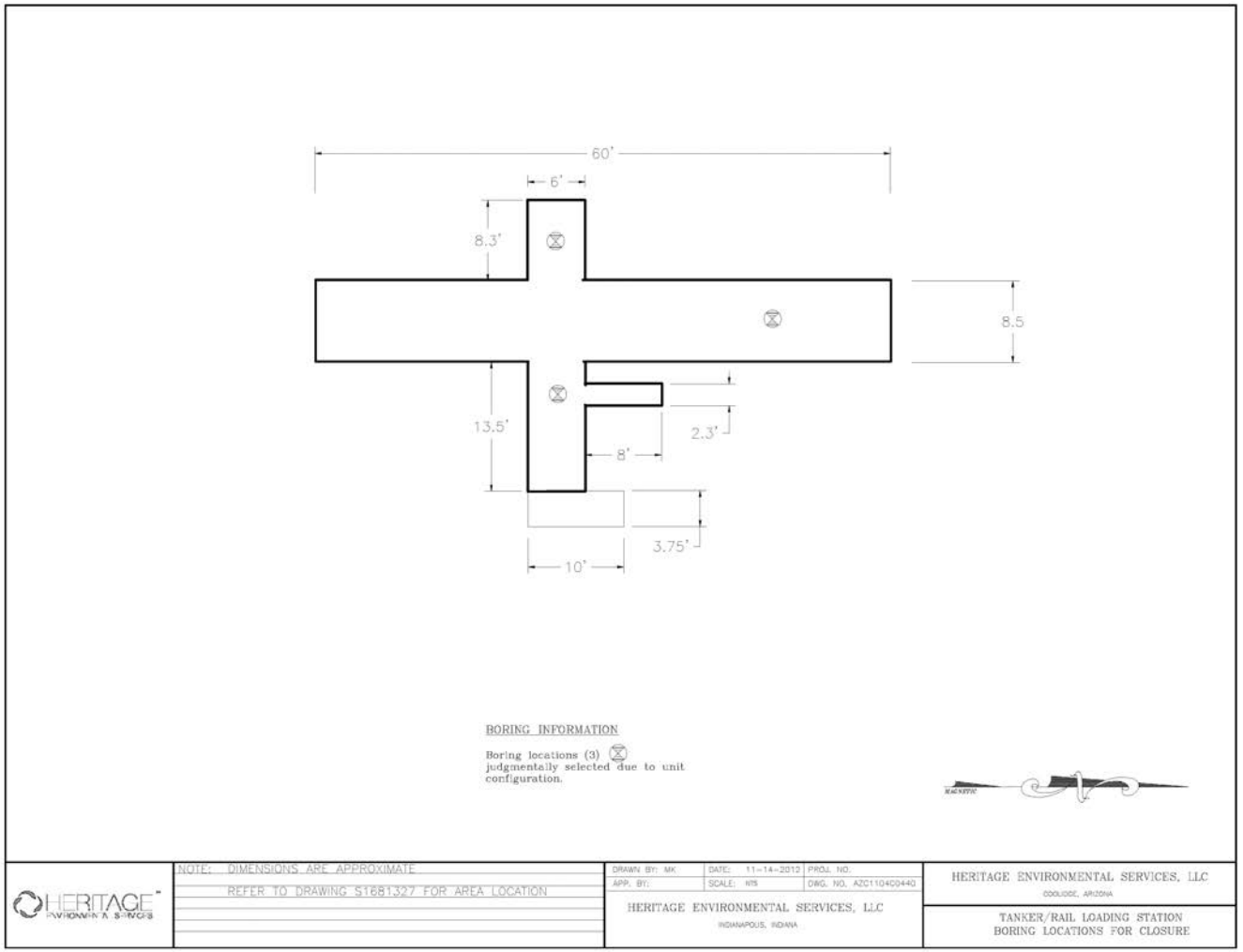

60'
6'
8.3'
8.5
13.5'
2.3'
8'
3.75'
10'
BORING INFORMATION
Boring locations (3) judgmentally selected due to unit configuration.
NOTE: DIMENSIONS ARE APPROXIMATE
REFER TO DRAWING S1681327 FOR AREA LOCATION
DRAWN BY: MK
DATE: 11-14-2013
PROJ. NO:
APP. BY:
SCALE: NTS
DWG. NO. AZC1104C0440
HERITAGE ENVIRONMENTAL SERVICES, LLC
INDIANAPOLIS, INDIANA
HERITAGE ENVIRONMENTAL SERVICES, LLC
COOLIDGE, ARIZONA
TANKER/RAIL LOADING STATION
BORING LOCATIONS FOR CLOSURE

FIGURE G-6

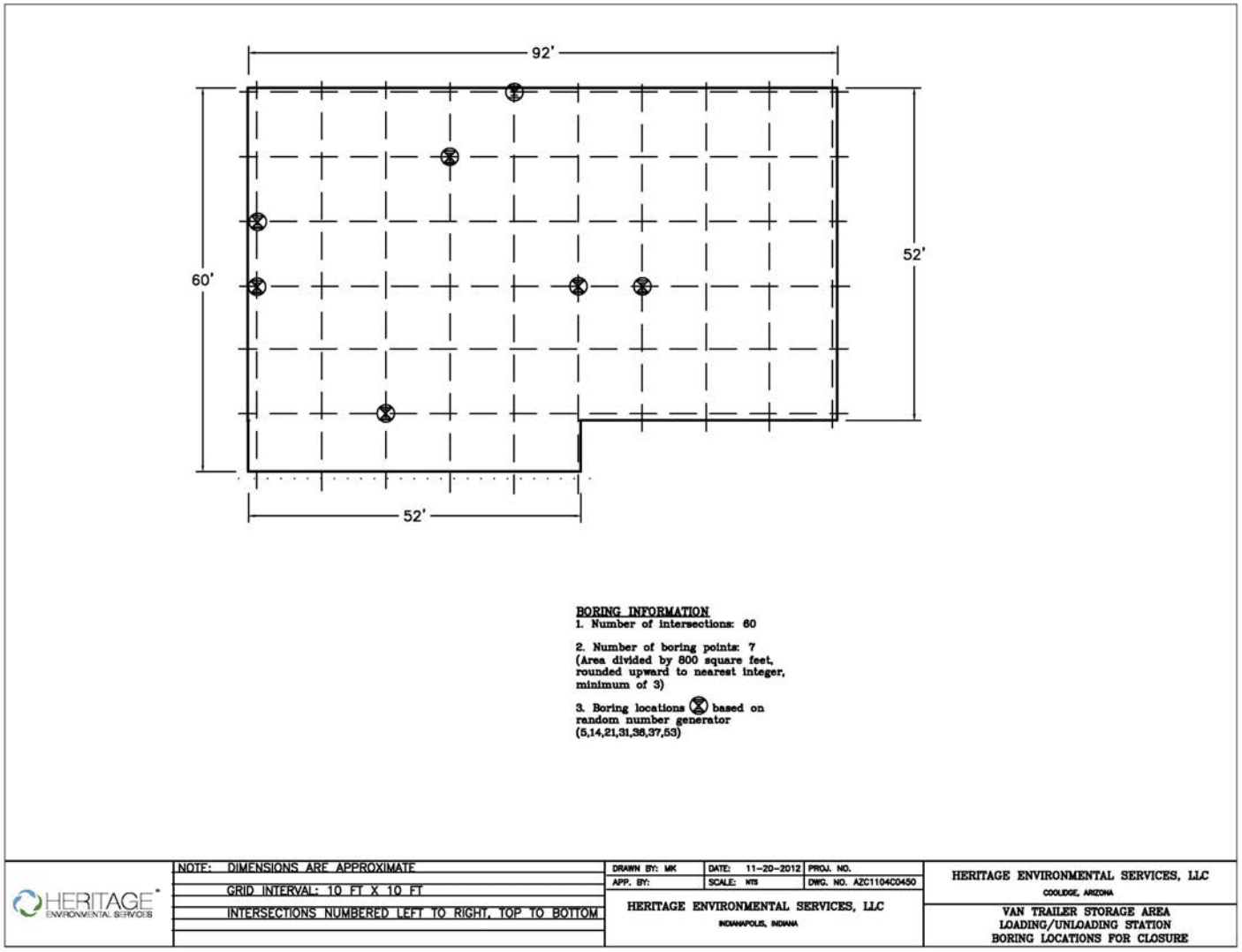

92'
60'
52'
52'
BORING INFORMATION
1. Number of intersections: 60
2. Number of boring points: 7
(Area divided by 800 square feet, rounded upward to nearest integer, minimum of 3)
3. Boring locations ⊗ based on random number generator
(5,14,21,31,38,37,53)
HERITAGE ENVIRONMENTAL SERVICES
NOTE: DIMENSIONS ARE APPROXIMATE
GRID INTERVAL: 10 FT X 10 FT
INTERSECTIONS NUMBERED LEFT TO RIGHT, TOP TO BOTTOM
DRAWN BY: MK
DATE: 11-20-2012
PROJ. NO.
APP. BY:
SCALE: NTS
DWG. NO. AZC1104C0450
HERITAGE ENVIRONMENTAL SERVICES, LLC
INDIANAPOLIS, INDIANA
HERITAGE ENVIRONMENTAL SERVICES, LLC
COOLIDGE, ARIZONA
VAN TRAILER STORAGE AREA
LOADING/UNLOADING STATION
BORING LOCATIONS FOR CLOSURE

FIGURE G-7

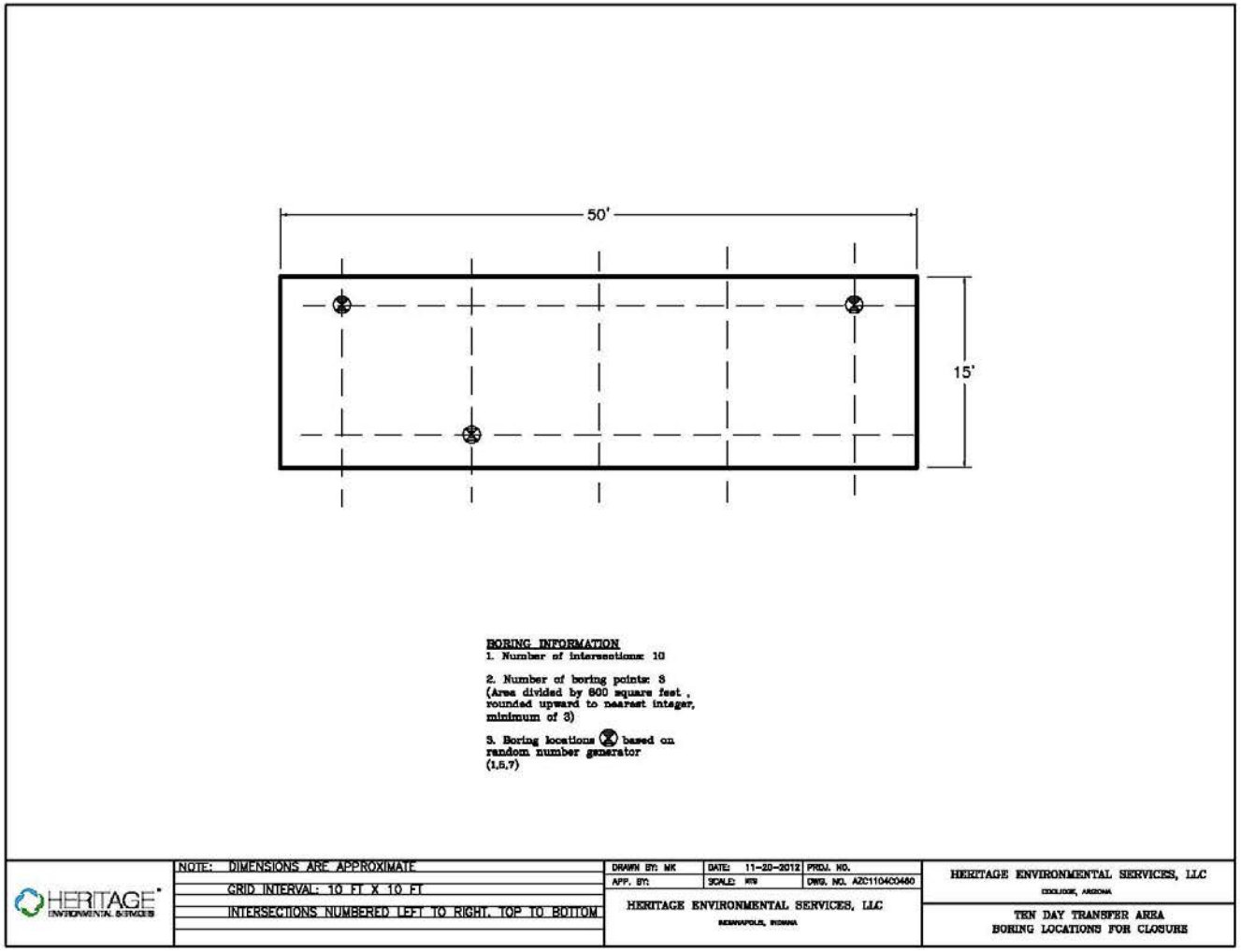
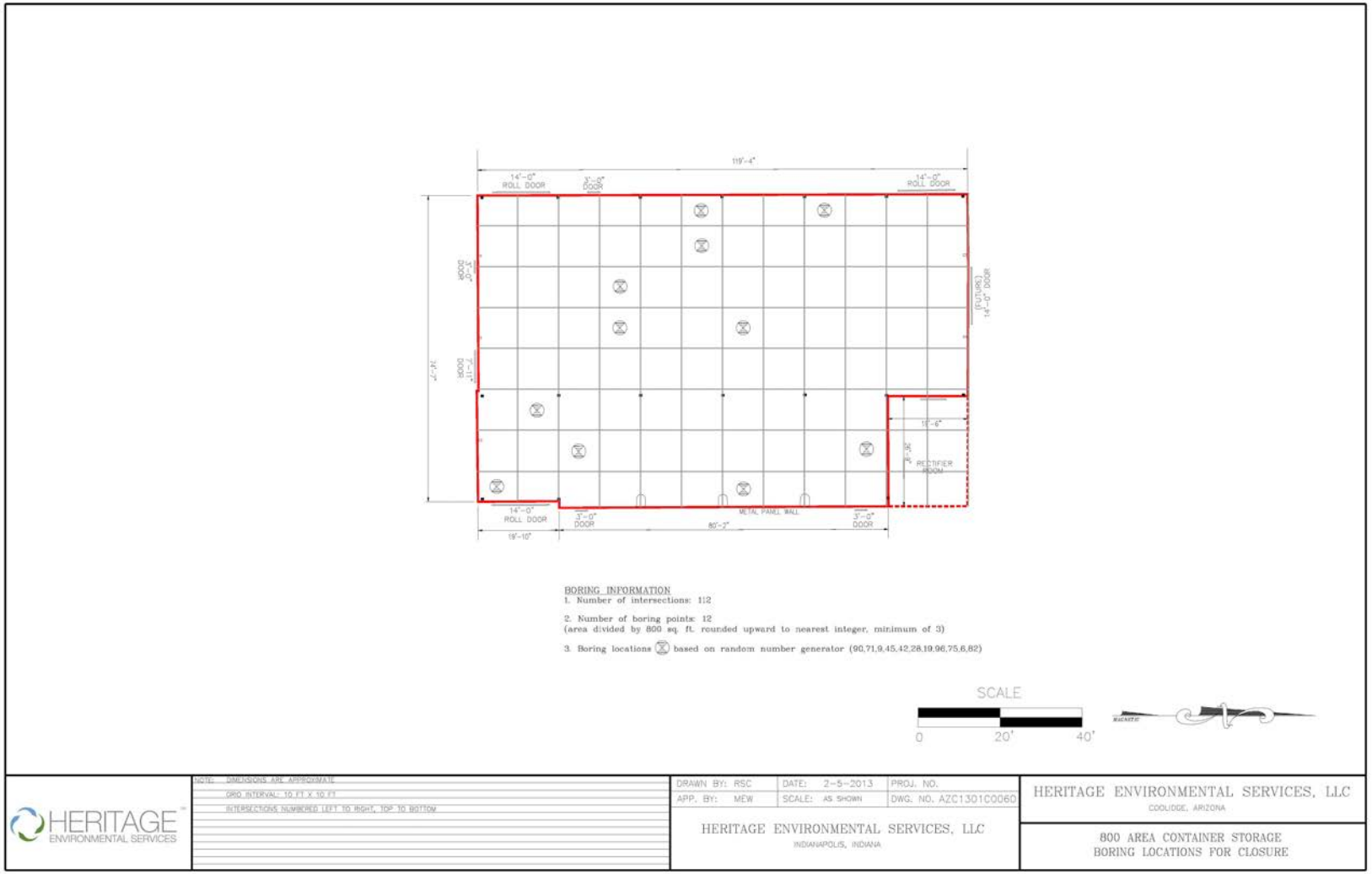

50'
15'
BORING INFORMATION
1. Number of intersections: 10
2. Number of boring points: 3
(Area divided by 600 square feet, rounded upward to nearest integer, minimum of 3)
3. Boring locations ⊗ based on random number generator
(1,5,7)
NOTE: DIMENSIONS ARE APPROXIMATE
GRID INTERVAL: 10 FT X 10 FT
INTERSECTIONS NUMBERED LEFT TO RIGHT, TOP TO BOTTOM
DRAWN BY: MK
DATE: 11-20-2012
PROJ. NO.
APP. BY:
SCALE: NTS
DWG. NO. AZC110400460
HERITAGE ENVIRONMENTAL SERVICES, LLC
HERITAGE ENVIRONMENTAL SERVICES, LLC
COOLIDGE, ARIZONA
TEN DAY TRANSFER AREA
BORING LOCATIONS FOR CLOSURE

FIGURE G-8


119'-4"
14'-0" ROLL DOOR
3'-0" DOOR
14'-0" ROLL DOOR
80'-0" OVERALL
(FUTURE) 14'-0" DOOR
80'-0" OVERALL
17'-6"
RECTIFIER ROOM
14'-0" ROLL DOOR
3'-0" DOOR
METAL PANEL WALL
80'-2"
3'-0" DOOR
19'-10"
BORING INFORMATION
1. Number of intersections: 112
2. Number of boring points: 12
(area divided by 800 sq. ft. rounded upward to nearest integer, minimum of 3)
3. Boring locations based on random number generator (90,71,9,45,42,28,19,96,75,6,82)
SCALE
0
20'
40'
NOTE: DIMENSIONS ARE APPROXIMATE
GRID INTERVAL: 10 FT X 10 FT
INTERSECTIONS NUMBERED LEFT TO RIGHT, TOP TO BOTTOM
DRAWN BY: RSC
DATE: 2-5-2013
PROJ. NO.
APP. BY: MEW
SCALE: AS SHOWN
DWG. NO. AZC1301C0060
HERITAGE ENVIRONMENTAL SERVICES, LLC
INDIANAPOLIS, INDIANA
HERITAGE ENVIRONMENTAL SERVICES, LLC
COOLIDGE, ARIZONA
800 AREA CONTAINER STORAGE
BORING LOCATIONS FOR CLOSURE

2. PROJECT ORGANIZATION AND RESPONSIBILITY

The following sections describe the responsibilities of each participant involved in the implementation of the Closure Plan. The various quality assurance, field, laboratory, and management responsibilities of key project personnel are described in the following sections. Heritage may perform some or all of the field activities during closure. Alternatively, Heritage may retain a qualified contractor(s) to perform some or all of the field activities during closure. An ADHS-licensed laboratory will perform laboratory testing of samples collected during closure.

2.1. Organization Chart

The organizational structure for implementing closure is shown on Figure 2-1.

2.2. Management Responsibilities

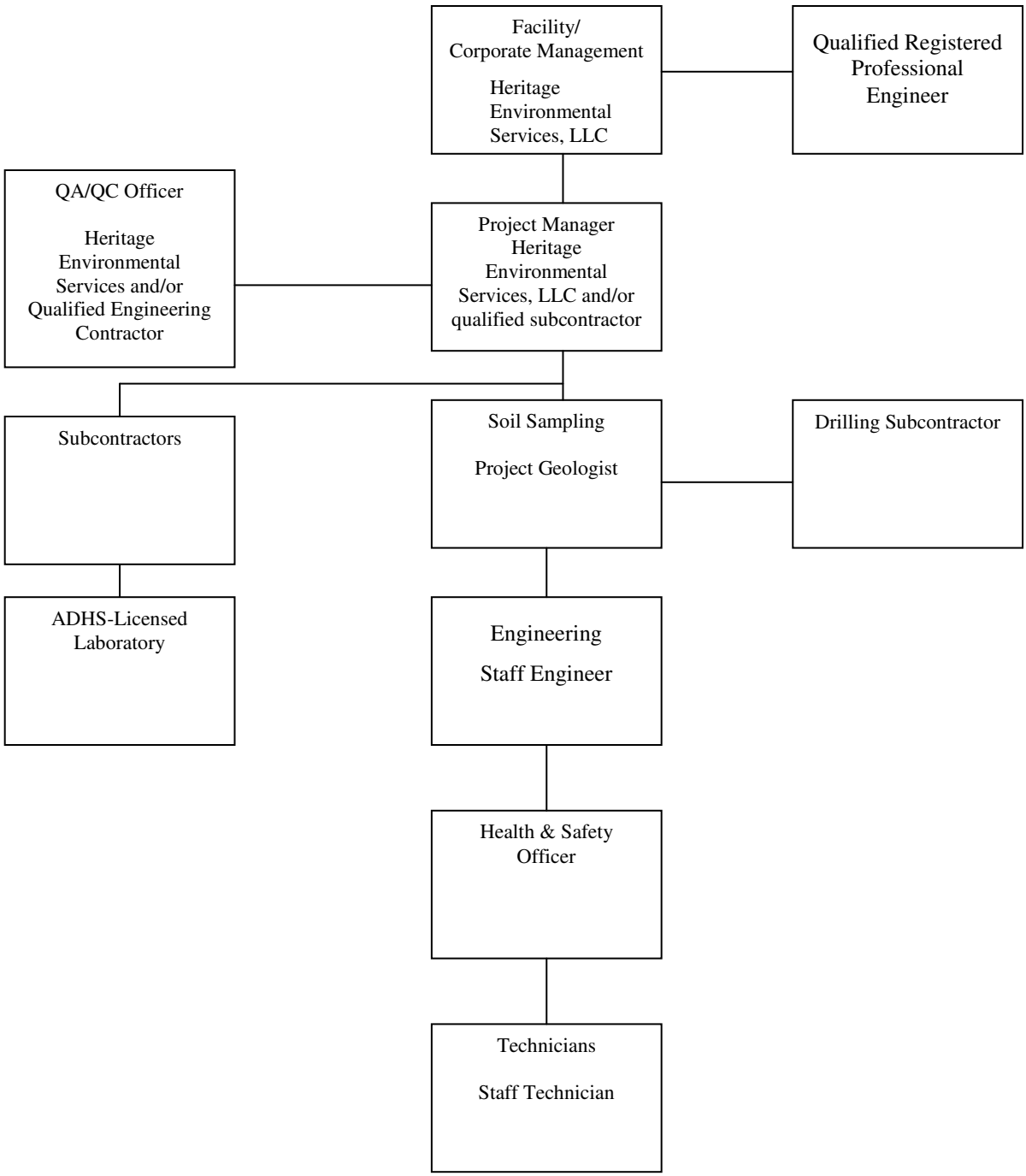
Heritage Environmental Services - Heritage technical representatives and management will be responsible for compliance with the requirements established in the approved Closure Plan. Heritage management responsibilities will include:

- acquiring and applying technical and corporate resources as needed to ensure performance within budget and schedule constraints;
- ensuring activities are performed in accordance with the Closure Plan requirements;
- providing review and approval of reports and plans to ensure that appropriate technical information is accurate and complete; and
- ensuring closure certification is submitted to the appropriate regulatory agency(ies).

Qualified Registered Professional Engineer - The qualified registered Professional Engineer will be responsible for observing key closure activities. The qualified registered Professional Engineer will review final work products to ensure that work quality complies with the specifications of the Closure Plan. The qualified registered Professional Engineer will ensure that the quality of data is acceptable, complete, and meets Closure Plan criteria, and that closure was performed in accordance with the procedures of the Closure Plan. Finally, the qualified registered Professional Engineer will be responsible for providing certification of closure.

Project Manager - The Project Manager will be responsible for coordination of all work performed during closure. The Project Manager will be responsible for reviewing all documentation and reports. With guidance and assistance from technical personnel, the Project Manager will ensure that the quality of the data is acceptable, complete, and meets Closure Plan objectives. The Project Manager will independently review select data generated to ensure that the work quality complies with the requirements specified in this QAPP, correct non-conformance with specified procedures, and provide technical supervision to personnel assigned to the project. The Project Manager will have the authority to direct field personnel, perform QAPP corrective action associated with the project, assign personnel to perform project activities, and control performance of the project.

Figure 2-1
Organizational Chart
Heritage Environmental Services, LLC



Quality Assurance Responsibilities

QA/QC Officer - The QA/QC officer will be responsible for ensuring that implementation of the project is performed in accordance with specified procedures. The QA/QC officer will review technical reports and will ensure that reports meet or exceed the specified quality requirements established in the Closure Plan and QAPP. In addition, the QA/QC officer or designee will be responsible for data validation of all sample results from the analytical laboratory.

2.3. Laboratory Responsibilities

The ADHS-licensed laboratory will be responsible for providing sampling kits, preparing samples for testing, performing analysis of samples, ensuring that data generated is accurate, and that the data conforms to the requirements of this QAPP or internal quality assurance/quality control and standard operating procedures (SOPs). (Note: Data validation by the project manager, or designee, will also be performed. See Section 9 of this QAPP). Analytical work will be conducted by ADHS-licensed laboratories in accordance with their established quality assurance/quality control protocols and standard operation procedures for the analytical methods specified in this QAPP.

The laboratory's Quality Assurance Manager, along with all laboratory personnel, will be responsible for the quality of data generated internally, the quality of data presented on external reports, ensuring that internal procedures are followed, and performing corrective action after identification of non-conformance. Laboratory Management will be responsible for internal audit functions. The laboratory Quality Assurance Manager or designee will be responsible for performing internal performance and system audits at the laboratory.

2.4. Field Responsibilities

During closure, Heritage technical personnel and/or subcontractors will collect and evaluate technical data. Following is a description of key personnel that will perform work at the facility.

Project Geologist - The Project Geologist or designee will be responsible for soil sampling activities and ensuring that all field work and report development associated with such activities conforms to requirements of this QAPP and the Closure Plan. The Project Geologist will be responsible to the Project Manager and will assist the Project Manager with day to day implementation of soil sampling, assessment of data, preparation of technical reports, overseeing subcontractor efforts, and identification of non-conformance with the specified requirements and correction of non-conformance with specified requirements.

Health and Safety Officer - All project personnel will be responsible for their safety and the safety of others. The Health and Safety Officer will provide technical expertise and guidance to the Project Manager with respect to safety and health issues. The Health and Safety Officer will be responsible for ensuring that implementation of the Closure Plan is performed in a safe manner.

Drilling Subcontractor - As field conditions warrant, a drilling subcontractor(s) may be used to install soil borings and obtain concrete cores at the facility. The drilling subcontractor(s) will perform work under the direction of the Project Geologist or designee. The drilling subcontractor(s) will be responsible for installation of concrete

and soil borings, obtaining samples using downhole collection devices, decontaminating drilling and sampling devices, properly sealing boreholes, maintaining drilling equipment, and performing any reporting function required for Licensed Drillers in the State of Arizona.

3. QUALITY ASSURANCE OBJECTIVES

The overall Quality Assurance (QA) objective is to develop and implement procedures for field sampling, chain-of-custody, laboratory testing, and reporting that will provide quality data to evaluate compliance with the closure performance standard as specified in the Closure Plan. A secondary QA objective is to achieve Quality Control (QC) acceptance criteria for precision and accuracy (see Sections 3.1 and 3.2 for further discussion). Completeness, representativeness, and comparability are also important aspects of QA (see Sections 3.3 through 3.5 for further discussion). Specific procedures for sampling, chain-of-custody, laboratory instrument calibration, laboratory analysis, reporting of data, internal quality control, audits, preventive maintenance of field equipment, and corrective action are described in other sections of this QAPP.

3.1. Precision

3.1.1. Definition

Precision is a measure of the degree to which two or more measurements are in agreement.

3.1.2. Field Precision Objectives

Field precision will be assessed through the collection and measurement of field duplicate samples. Field duplicates will be collected at a frequency of one duplicate for each 20 samples or less. At least one field duplicate for each matrix type will be collected.

3.1.3. Laboratory Precision Objectives

Precision in the laboratory will be assessed through the calculation of relative percent differences and relative standard deviations for three or more replicate samples. The ADHS-licensed laboratory's QAP describes the laboratory precision objectives and procedures.

3.2. Accuracy

3.2.1. Definition

Accuracy is the degree of agreement between an observed value and an accepted reference value.

3.2.2. Field Accuracy Objectives

Accuracy in the field will be assessed through the use of field and trip blanks and adherence to sample collection, preservation requirements, and holding times. One field blank per day and one trip blank per day will be collected when samples are collected for organics analysis. In addition, field samples will be submitted as matrix spike/matrix spike duplicates to be spiked by the laboratory to evaluate the accuracy of data based on actual field matrices.

3.2.3. Laboratory Accuracy Objectives

Accuracy in the laboratory will be assessed through the analysis of matrix spikes or standard reference materials and the determination of percent recoveries. The equations to be used by the laboratory for calculation of accuracy are part of the ADHS-licensed laboratory's QAP. Accuracy control limits are maintained as part of the ADHS-licensed laboratory's QAP for the methods being performed.

3.3. Completeness

3.3.1. Definition

Completeness is a measure of the amount of valid data obtained from a measurement system compared to the amount that was expected to be obtained under normal conditions.

3.3.2. Field Completeness Objectives

Field completeness is a measure of the amount of valid field measurements obtained from measurements collected during the project. The equation for completeness is presented in Section 12.3 of this QAPP. Field completeness for this project is anticipated to be between ninety and one-hundred percent.

3.3.3. Laboratory Completeness Objectives

Laboratory completeness is a measure of the amount of valid measurements obtained from all the measurements collected during a project. Further discussion of specific measurements and the equation used to measure completeness are provided in Section 12.3 of this QAPP.

3.4. Representativeness

3.4.1. Definition

Representativeness expresses the degree to which data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, process conditions, or an environmental condition.

3.4.2. Measures to Ensure Representative Field Data

Representativeness is dependent on the proper design of the sampling program. Adherence to the sampling techniques and following specified sampling plans will ensure that representative data is collected. The sampling network was designed to provide data representative of facility conditions during closure. During development of this network, careful consideration was given to evaluating whether or not representative data would be collected.

Soil sample locations will be selected using a simple random sampling scheme. This method was chosen as the most efficient and practical manner to accurately determine whether constituents are present in soil at regulatory levels of concern. Simple random sampling is the method recommended in EPA Publication No. SW-846 ("Test Methods for Evaluating Solid Waste, Physical/Chemical Methods") for sampling heterogeneous non-stratified materials. Analysis of soil samples from randomly chosen locations in the areas undergoing closure for the appropriate parameters will indicate whether constituents remain in the soil at levels of regulatory concern.

3.4.3. Measures to Ensure Representative Laboratory Data

Representativeness in the laboratory will be ensured by following proper analytical procedures, evaluating matrix duplicates, and meeting holding times.

3.5. Comparability

3.5.1. Definition

Comparability is an expression of the confidence with which one data set can be compared with another.

3.5.2. Measures to Ensure Comparability of Field Data

Comparability is dependent on the proper design of the sampling program and will be satisfied by ensuring the sampling procedures are followed. Comparability will also be dependent on the sample matrices and the assessment of sample matrices when comparing field measurements. Section 4 of this QAPP provides a detailed discussion of sampling procedures.

3.5.3. Measures to Ensure Comparability of Laboratory Data

Analytical data will be compared when similar sampling and analytical procedures are followed and documented. Comparability will be dependent on the sample matrices and the assessment of sample matrices when comparing field measurements.

3.6. Level of Quality Control Effort

During implementation of the Closure Plan, trip blanks, field blanks, method blanks, matrix duplicates, standard reference materials, and matrix spikes will be used to assess the quality of data generated from sampling and analysis.

Field/Trip Blanks - Field blanks and trip blanks will be submitted for analysis of organic constituents by sampling personnel to evaluate potential external contamination resulting from sampling procedures, sample handling, and/or sample testing. Because all sample collection at the facility will be performed in a similar manner using prescribed procedures to minimize the potential for cross contamination (see Section 4 of this QAPP), field blanks and trip blanks will be collected at a frequency of one field blank and one trip blank per day when samples are being collected for organic constituents. Depending on the equipment being used during the sampling and analysis program, equipment rinse blanks will also be collected as field blanks.

Method Blanks - Method blanks will be used within the laboratory to assess laboratory contamination resulting from laboratory procedures and practices. The frequency of analysis for method blanks is specified in the ADHS-licensed Laboratory's QAP.

Matrix Spike/Matrix Spike Duplicates - During closure, Heritage will be collecting matrix spikes and matrix spike duplicates for testing at the laboratory. Site-specific matrix spikes and matrix spike duplicates will be utilized to evaluate method performance with matrices submitted and to evaluate precision of the testing. Matrix spike and matrix spike duplicates will be collected at a frequency of one set per twenty or fewer samples for each type of sample matrix.

Field Duplicates - Field duplicates will be collected and tested to evaluate sample reproducibility or precision for each type of sample matrix. Field duplicates will be collected at a frequency of one duplicate for each twenty or fewer samples for each type of sample matrix. Field duplicates will also be utilized to evaluate the potential for external contamination resulting from sample handling or testing.

Field QC samples will be collected in a manner similar to the actual field samples collected for each matrix. In addition to field QC samples, QA objectives will be met by utilizing experienced, trained personnel for supervising sampling and following prescribed sampling procedures. Sampling procedures are described in Section 4.

4. SAMPLING PROCEDURES

Detailed procedures for collection of samples during closure are provided in the following sections.

4.1. Field Sampling by Matrix

4.1.1. Sample Location and Identification

The following nomenclature will be used to properly label samples submitted for testing. The sample nomenclature will be used for all sample labels, sample submission sheets, and chain-of-custody records to maintain consistency in the labeling procedures and allow efficient handling of a potentially large number of samples. In addition to a standardized sample designation format, date and time of collection and the company name will be included on labels, sample submission sheets, chain-of-custody records, and laboratory analysis reports.

Following is a description of the nomenclature to be used for the samples collected during closure.

Concrete Samples

The following nomenclature will be used to label concrete samples:

C-HAZARDOUS WASTE MANAGEMENT UNIT - CONSECUTIVE BORING NUMBER

- The "C" indicates that the sample is a concrete sample.
- The hazardous waste management unit identifies the area from which the sample was collected.
- The sample location is the designated location of each boring or sample location at each hazardous waste management unit.

For example:

A concrete sample collected at the Central Storage Area at sample location 3 would be labeled:

C-Central Storage Area-03

Soil Samples

Soil samples will be labeled as follows:

SS - HAZARDOUS WASTE MANAGEMENT UNIT - SAMPLE LOCATION - DEPTH OF SAMPLE OR INTERVAL

- The "SS" indicates that the sample is a soil sample.
- The hazardous waste management unit identifies the area from which the sample was collected.
- The sample location is the designated location of each boring or sample location at each hazardous waste management unit.

For example:

A soil sample collected from 0 to 1 foot below grade at the Central Storage Area at sample location 3 would be labeled:

SS-Central Storage Area-03-0-1

Field Quality Assurance/Quality Control Samples

QA/QC samples for soil and concrete samples will be labeled in the same format as shown in the previous two sections along with a modifier to designate the type of QA/QC sample and/or analysis to be performed.

Following is a list of modifiers to be added to the sample description for samples collected as spikes or duplicates in the field:

Matrix Spikes - (MS)
Matrix Spike Duplicates - (MSD)
Field Matrix Duplicates - (D)

Blanks

Blanks will be collected during closure as part of the field QA/QC program. Blanks will be labeled in consecutive order as they are submitted to the analytical laboratory. Blanks will have a modifier designating them as blanks. Trip blanks will be modified with "(TB)" and field blanks will be designated with "(FB)." For example:

The fifth soil field blank submitted to the laboratory would be labeled as "SS-5 (FB)." Blanks will be cross-referenced to specific samples by comparing dates of submission with the samples submitted.

4.1.2. Concrete and Soil Sampling Procedures for Chemical Analysis

The following is a description of the concrete and soil sampling procedures that will be followed during closure. Samples will be collected using decontaminated equipment best suited for the type of samples being collected. Equipment expected to be used to collect concrete and soil samples is described in Section 7 of the Closure Plan. Selection of sample locations is described in Section 7.1 of the Closure Plan. Sample frequency, sample depth, and sample collection methods are described in Sections 7 of the Closure Plan.

When a sample has been collected, it will be brought to the surface and removed from the sampler. Soil and concrete samples being tested for volatile organic compounds will be immediately containerized following the requirements of USEPA SW-846 5035. The remaining portion of the sample will be placed into a mixing bowl. During initial screening analysis, a portion of each sample will be placed in a sample screening container and the headspace will be scanned with an organic vapor analyzer (e.g., PID or FID; see Section 7.1). Samples will be carefully placed into the appropriate sample containers provided by the testing laboratory. Sampling personnel will wear disposable gloves or use a stainless steel or disposable plastic sample scoop to transfer samples to sample containers. Disposable gloves and/or scoops will be replaced prior to collecting each sample.

Soil or concrete selected for volatile organic compound analysis will be placed into containers following the procedure of USEPA SW-846 5035 prior to placing other portions of the sample into the appropriate containers. After completing the volatile organic compound portion of the sample collection process, the remaining portion of sample in the bowl will be mixed to the extent possible. After mixing, the sample will be placed in the sample containers. All samples will be collected and transferred to the appropriate containers in a manner so as to minimize exposure to the environment.

Sample recording and chain-of-custody procedures are detailed in Sections 4.4 and 5. Soil samples will be described in the field by a Project Geologist or his designee using the Modified United States Department of Agriculture Soil Classification System (see Figure 4-1). A log of each soil boring (similar to Figure 4-2) will be generated in the field. Because of the shallow depth of the soil borings, the boring may be left open until closure activities have been completed or filled with cement/concrete mixture.

Figure 4-1

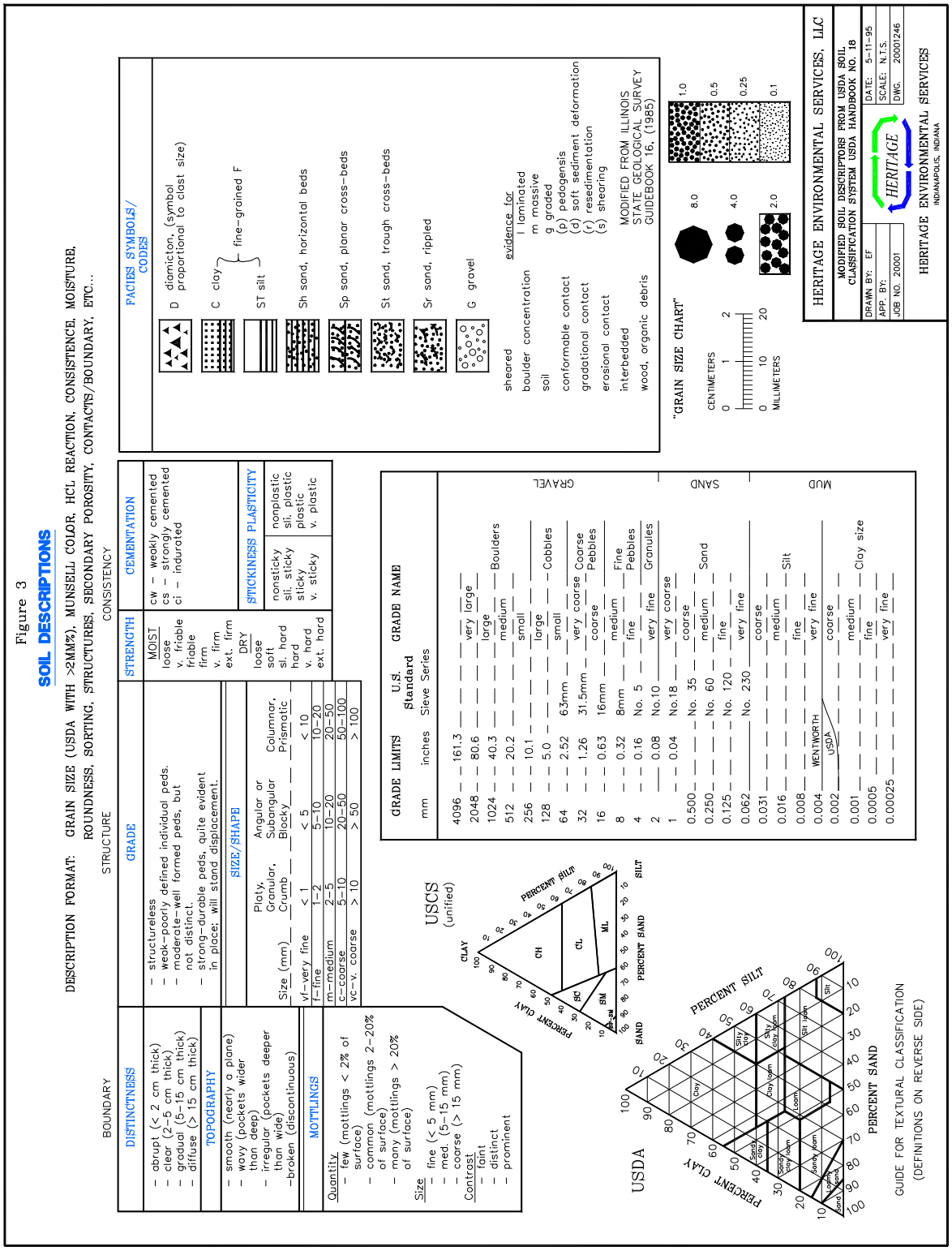


Figure 3
SOIL DESCRIPTIONS
DESCRIPTION FORMAT: GRAIN SIZE (USDA WITH >2MM%), MUNSELL COLOR, HCL REACTION, CONSISTENCE, MOISTURE, ROUNDNESS, SORTING, STRUCTURES, SECONDARY POROSITY, CONTACTS/BOUNDARY, ETC...
BOUNDARY
DISTINCTNESS
- abrupt (< 2 cm thick)
- clear (2-5 cm thick)
- gradual (5-15 cm thick)
- diffuse (> 15 cm thick)
TOPOGRAPHY
- smooth (nearly a plane)
- wavy (pockets wider than deep)
- irregular (pockets deeper than wide)
-broken (discontinuous)
MOTTLINGS
Quantity
- few (mottlings < 2% of surface)
- common (mottlings 2-20% of surface)
- many (mottlings > 20% of surface)
Size
- fine (< 5 mm)
- med. (5-15 mm)
- coarse (> 15 mm)
Contrast
- faint
- distinct
- prominent
STRUCTURE
GRADE
- structureless
- weak-poorly defined individual peds.
- moderate-well formed peds, but not distinct.
- strong-durable peds, quite evident in place; will stand displacement.
SIZE/SHAPE
Size (mm) | Platy, Granular, Crumb | Angular or Subangular Blocky | Columnar, Prismatic
vf-very fine | < 1 | < 5 | < 10
f-fine | 1-2 | 5-10 | 10-20
m-medium | 2-5 | 10-20 | 20-50
c-coarse | 5-10 | 20-50 | 50-100
vc-v. coarse | > 10 | > 50 | > 100
CONSISTENCY
STRENGTH
MOIST
loose
v. friable
friable
firm
v. firm
ext. firm
DRY
loose
soft
sl. hard
hard
v. hard
ext. hard
CEMENTATION
cw - weakly cemented
cs - strongly cemented
ci - indurated
STICKINESS PLASTICITY
nonsticky | nonplastic
sli. sticky | sli. plastic
sticky | plastic
v. sticky | v. plastic
USCS (unified)
PERCENT CLAY
PERCENT SILT
PERCENT SAND
CLAY
SILT
SAND
CH
CL
ML
SC
SM
SP-SM
USDA
PERCENT CLAY
PERCENT SILT
PERCENT SAND
Clay
Silty Clay
Clay Loam
Silt
Silt Loam
Sandy Clay
Loam
Sandy Clay Loam
Sandy Loam
Loamy Sand
Sand
GUIDE FOR TEXTURAL CLASSIFICATION
(DEFINITIONS ON REVERSE SIDE)
GRADE LIMITS U.S. Standard GRADE NAME
mm | inches | Sieve Series
4096 | 161.3
2048 | 80.6 | very large | Boulders
1024 | 40.3 | large
512 | 20.2 | medium
256 | 10.1 | small | Cobbles
128 | 5.0 | large
64 | 2.52 | small
32 | 1.26 | 31.5mm | very coarse | Coarse Pebbles
16 | 0.63 | 16mm | coarse
8 | 0.32 | 8mm | medium | Fine Pebbles
4 | 0.16 | No. 5 | fine
2 | 0.08 | No.10 | very fine | Granules
1 | 0.04 | No.18 | very coarse
0.500 | No. 35 | coarse
0.250 | No. 60 | medium | Sand
0.125 | No. 120 | fine
0.062 | No. 230 | very fine
0.031 | coarse
0.016 | medium | Silt
0.008 | fine
0.004 | WENTWORTH | very fine
0.002 | USDA | coarse
0.001 | medium | Clay size
0.0005 | fine
0.00025 | very fine
GRAVEL
SAND
MUD
FACIES SYMBOLS/ CODES
D diamicton, (symbol proportional to clast size)
C clay
fine-grained F
ST silt
Sh sand, horizontal beds
Sp sand, planar cross-beds
St sand, trough cross-beds
Sr sand, rippled
G gravel
evidence for
sheared
boulder concentration
soil
conformable contact
gradational contact
erosional contact
interbedded
wood, organic debris
l laminated
m massive
g graded
(p) pedogensis
(d) soil sediment deformation
(r) resedimentation
(s) shearing
MODIFIED FROM ILLINOIS STATE GEOLOGICAL SURVEY GUIDEBOOK 16, (1985)
"GRAIN SIZE CHART"
CENTIMETERS
MILLIMETERS
8.0
4.0
2.0
1.0
0.5
0.25
0.1
HERITAGE ENVIRONMENTAL SERVICES, LLC
MODIFIED SOIL DESCRIPTORS FROM USDA SOIL CLASSIFICATION SYSTEM USDA HANDBOOK NO. 18
DRAWN BY: EF
APP. BY:
JOB NO. 20001
DATE: 5-11-95
SCALE: N.T.S.
DWG. 20001246
HERITAGE
HERITAGE ENVIRONMENTAL SERVICES
INDIANAPOLIS, INDIANA

Figure 4-2 Example Boring Log

HERITAGE ENVIRONMENTAL SERVICES, LLC
EXAMPLE BORING LOG

Sheet ____ of ____

CLIENT: JOB SITE: Job No.:

DEPTH FEET	DESCRIPTION	BLOW COUNTS	ORGANIC VAPOR READINGS		SAMPLE DEPTH	REC. (%)	FIELD OBSERVATIONS
- 2.0	Example Form				0-4		
- 4.0							
- 6.0					4-8		
- 8.0							
- 10.0					8-12		
- 12.0							
- 14.0					12-16		
- 16.0							
- 18.0					16-20		
- 20.0							

DATE DRILLED:_____ CORE SIZE:_____ BORING NO.:_____
DRILLED BY:_____ WEATHER/SITE CONDITIONS: SURFACE ELEV:_____
DRILLING METHOD:_____ TOTAL DEPTH:_____ GEOLOGIST:_____
SAMPLING METHOD:_____ FINAL WATER:_____ GROUT HOLE:_____
INITIAL WATER:_____ WELL INSTALLED:_____

ADDITIONAL REMARKS/OBSERVATIONS:
* = Sample submitted for lab analysis

4.2. Field QC Sample Collection/Preparation

Generally, QA/QC samples will be collected in the same manner as any other sample. The QA/QC samples will be managed, handled, and documented as they would for actual samples. For matrix spike, matrix spike duplicates, and field duplicates, samples will be placed in the same types of containers as the samples. Efforts will be made to ensure that matrix spike, matrix spike duplicates, and field duplicates are handled in the same manner as the actual samples. For example, the QA/QC samples will be collected at the same time as the actual samples using the same equipment, each sample will be packaged and handled as an actual sample, and the QA/QC samples will be analyzed along with the actual samples.

Trip blanks, as necessary, will be prepared by the testing laboratory. The testing laboratory will utilize deionized water in 40-milliliter Teflon lined septum vials and an appropriate amount of preservative. The testing laboratory will prepare a sufficient number of trip blanks to be included with all coolers containing samples being tested for volatile organic constituents immediately prior to the containers leaving the laboratory.

For equipment field blanks, the equipment used for sampling will be decontaminated using the prescribed procedures. After fully decontaminating the equipment, deionized water will be poured over the equipment and decanted into the appropriate containers and packaged in the same manner as actual samples. For other types of field blanks, deionized water will be used to prepare field blanks.

4.3. Containers, Preservatives and Volume Requirements

Table 4-1 provides information that includes holding times, sample preservation, and container descriptions.

4.4. Sample Handling and Documentation

This section presents procedures for proper handling and documentation of environmental samples:

- The appropriate amount of chemical preservatives, if any, will be placed in the sample containers prior to sample collection. This is usually performed by the testing laboratory.
- Once samples are collected, caps will be screwed tightly onto containers.
- A sample label will be completed using a water resistant marker. See Section 4.1.1 for labeling requirements. The label will contain the project name, date, and time of collection. An example label is provided as Figure 4-3. Each sample will also be documented using forms similar to Figure 4-4.
- Sample containers will be placed in Zip-Loc bags (or equivalent) to keep them dry and contain their contents in the case of breakage during transport.
- Samples will then be placed in ice chests containing ice. Samples must be packed with sufficient cushioning material to prevent breakage of glass sample containers during transport. The samples will be transported to the laboratory and stored prior to analysis, if necessary, under refrigeration at 4 degrees Centigrade.

Table 4-1
Sample Volume, Containers and Preservation
Techniques Aqueous and Soil/Concrete Samples
Heritage Environmental Services, LLC
Coolidge, Arizona

Parameter Class[1]	Container[2][5]	Preservative	Holding Time[3]	Sample Volume[4]
Semi-Volatile Organic Compounds (Base/Neutral, Acid Extractables) Pesticides/Herbicides	4-1 liter glass jar with Teflon-lined cap (aqueous)	Iced to ≤6□C (aqueous/soil/concrete)	Semi-Volatile Organics: 14 days until extraction 40 days after extraction Pesticides/Herbicides: 7 days until extraction 40 days after extraction	4 liters (aqueous)
	1-1 liter glass jar with Teflon-lined cap (soil/concrete)			1 liter (soil)
Volatile Organic Compounds	2-40 ml VOA vials with Teflon-lined septum (aqueous)	HCl to pH <2; Iced to ≤6□C (aqueous)	14 days	80 ml, no headspace (aqueous)
	SW-846 5035 Container and 2 oz. Glass Container (soil/concrete)	Iced to ≤6 □C (soil/concrete)		SW-846 5035 Container (TerraCor, Encore) and 2 oz. Glass container filled completely (soil/concrete)
Metals	1-1 liter polyethylene (aqueous)	HNO_3 to pH <2; Iced to ≤6 ^{o}C (aqueous)	6 Months Mercury is 28 days Hexavalent chromium is 7 Days	1 liter (aqueous)
	1 liter glass Teflon-lined cap (soil/concrete)	Iced to ≤6□C (soil/concrete)		1 liter (soil/concrete)
Cyanide	500 ml polyethylene (aqueous)	NaOH to pH >12; Iced to ≤6 ^{o}C	14 days	500 ml
	1 liter glass Teflon-lined cap (soil/concrete)	Iced to ≤6□C (soil/concrete)		1 liter (soil/concrete)

(1) Tables 7-1, 7-2, 7-3 and 7-4 list constituents to be analyzed.
(2) Sample containers utilized for this effort will be provided by the testing laboratory.
(3) The start of holding times will be the date of collection.
(4) For matrix spike/matrix spike duplicates, additional sample volume may be collected.
(5) Other acceptable container types or volumes at the time of closure may be used.

Figure 4-3
Example of Sample Label

Date Sampled	Time Sampled
Company Name	
Sample Description	
Laboratory Use Only	Preservative

Figure 4-4 Example of Sample Submission/Chain of Custody Form

TO ENSURE PROPER HANDLING OF SAMPLES PLEASE COMPLETE THE SHADED AREAS OF THIS FORM

HERITAGE ENVIRONMENTAL SERVICES, LLC.

COMMERCIAL LABORATORY OPERATIONS

I -

7901 West Morris Street Indianapolis IN 46231

www.heritage-enviro.com (800)827-4374 Fax: (317) 486-5095

Bill to Customer:

Project Name:

Z Quote No: (Given to you by your contact)

PO No. or Project/Activity ID:

PRINT HERITAGE TSR NAME:

CUSTOMER STATUS: New / Existing

If no previous credit has been established with Heritage, **prepayment** (check,VISA,etc) is required at the time of sample submittal to the laboratory.

Sampled By:

Analyses Requested

(Note special detection limits or methods)

Send Report To:

Co:

Add:

Attn:

Phone: ( ) Yes

Fax: ( )

E-mail:

Sample Turn Around Time

Standard:_____Rush Date____/____/____

Mo Day Yr

(Accelerated TAT subject to Additional Charge)

(Date must be Accepted and Approved by Lab)

Date Sampled	Time sampled	Comp	Grab	Sample ID and/or Location where your sample was taken	Sample Type (Matrix): DW, GW, WW, Soil, Oil, Sludge, Swipe, Other	Number Of Containers										Remarks:	Lab use only Sample No.
	AM PM																
	AM PM																
	AM PM																
	AM PM																
	AM PM																
	AM PM																
	AM PM																
	AM PM																
	AM PM																
	AM PM																

Relinquished by: (Signature) Date/Time / Received by: (Signature)

Relinquished by: (Signature) Date/Time / Received by: (Signature)

Relinquished by: (Signature) Date/Time / Received by: (Signature)

Received for Lab by: (Signature) Date Temp. °C

Time ROI: Yes / No

Distribution: White original and Yellow copies to accompany sample to the laboratory.
Pink copy to be retained by the client.

Laboratory use only	Yes	No
Custody seals present/intact?		
Broken containers?		
COC agree with sample labels?		
Correct containers for testing?		
Headspace issues acceptable?		
Holding time(s) acceptable?		
Preservative pH's acceptable?		
Was pH left unadjusted?		

Comments:

- Samples will be delivered to the testing laboratory via overnight carrier or via ground transportation. Samples not shipped or delivered on the day collected will be stored on ice in a secure area consistent with chain-of-custody requirements (see Section 5).
- The following recordkeeping items will be used to document sample collection and handling:

  Boring Logs (Figure 4-2)
  Sample Labels (Figure 4-3)
  Chain-of-Custody/Sample Submission Sheets (Figure 4-4)
  Analytical Records (sent by the testing laboratory to a designated representative)
  The information typically recorded in the field records for samples collected during closure includes the information shown in Table 4-2.
- Prior to sampling, all personnel will be briefed on sample handling, chain-of-custody, and documentation procedures.

4.5 Decontamination of Equipment

To mitigate the potential for cross-contamination and the introduction of contaminants from external sources, all field sampling equipment will be decontaminated. Decontamination will be performed between each concrete or soil sample location unless dedicated sampling equipment is used.

Sampling equipment will be decontaminated in the following manner:

- Equipment will be washed with potable "tap" water or distilled water and phosphate free soap solution, followed by a thorough rinse with distilled deionized water. Equipment will be decontaminated in tubs, five gallon buckets, or other suitable containers.
- Equipment will be allowed to air dry unless prohibited by weather conditions. If the sampling equipment requires storage for a long period of time prior to collection of the next sample, the equipment will be wrapped in aluminum foil or stored in a suitable container.
- Gloves or other disposable materials contacting the sample media will be discarded after each sample has been obtained. These items will be replaced prior to collection of a sample to minimize the probability of cross-contamination between samples.

Heavy equipment, such as augers, drilling rods, hand tools, and heavily soiled sampling equipment, will be decontaminated using pressurized hot water between each soil boring.

Wastes generated during the collection of samples (drill cuttings, decontamination fluids, etc.) will be managed in accordance with Section 7.4 of the Closure Plan.

Table 4-2
Information Typically Recorded in Field Records

Location of sampling
Contact person
Address
Location of facility
Type of sample
Parameters to be analyzed
Preservation and treatment
Number and volume of sample containers
Description of sampling method
Date and time of collection
Sampler's name
Sample number
Laboratory(ies)
Field observations (if any)
Field measurements (if any)

5. SAMPLE CUSTODY

The following chain-of-custody procedures are intended to document sample possession from the time of sample collection until disposal and provide sufficient evidence in project files for all testing activities.

A sample is under custody if it is:

- In one's actual possession;
- In view after being in physical possession;
- In one's possession and placed in a secured location; or
- In a secured area, accessible to authorized personnel only.

5.1. Field Custody Procedures

The sample packaging and shipment procedures summarized below will ensure that the samples will arrive at the testing laboratory with the chain-of-custody intact.

- A label identifying the sample will be affixed to the sample. The labels will be completed with waterproof ink unless prohibited by environmental conditions.
- A chain-of-custody record similar to that shown in Figure 4-4 will be completed in the field. The original will accompany the samples and copies will be retained at intermediate steps.
- Each time responsibility for custody of the samples changes, the new custodian will sign the record and note the date. A copy of the signed record will be made and retained by the previous custodian except for commercial carriers (e.g., Federal Express, UPS, etc.). In this case, airbills or shipping receipts will be utilized for documenting custody of samples provided the chain-of-custody remains sealed inside with the samples. As few people as possible will handle the samples.

Samples collected on Fridays or Saturdays will remain in the possession of samplers following prescribed chain-of-custody procedures until they can be delivered on Monday during normal business hours. Additional procedures for samples with short holding times will be initiated as necessary.

5.2. Sample Packaging Procedures for Overnight Carrier

The following procedures will be implemented in the event that shipment via commercial carrier is required.

- Confirm that each sample is properly labeled and sealed. Note the sample numbers and be sure that samples are in the cooler with their respective chain-of-custody.
- Place each sample in a plastic Zip-Loc (or equivalent) bag and remove air to conserve space.
- In the bottom of a dry cooler, place absorbent for cushioning and absorption of water. If present, be sure that the drain on the cooler is taped and sealed inside and outside.
- Place a large, empty plastic bag in the cooler and fill it with cushioning material (e.g., bubble wrap or Styrofoam).
- Place the samples on ice and cover with additional cushioning material and additional bags of ice.
- Twist the plastic bag to create a "goose-neck". Seal the plastic bag by wrapping tape around the "goose-neck."

- Fill the remainder of the cooler with absorbent and cushioning material.
- Tape the completed chain-of-custody and other pertinent information for the testing laboratory in a Zip-Loc bag and seal. Attach the chain-of-custody materials to the cooler.
- Close the lid on the cooler and wrap strapping tape or duct tape securely around the lid of the cooler to prevent water from leaking out of the cooler. Wrap tape around the cooler to securely hold the lid and cooler together.
- Place "This Side Up" stickers or arrows on the cooler and properly complete shipping labels. Affix the bill of lading to the cooler. Be sure that the samples are marked for "next day" delivery and deliver the samples to the appropriate collection point.

5.3. Laboratory Custody Procedures

The ADHS-licensed laboratory will follow its specified procedures for maintaining custody in the laboratory as described in its QAP.

5.4. Field Records and Documentation

Field records will serve as the way to record data collecting activities as they are performed. Pre-printed forms or logbooks will be used to record field activities. Entries will be in as much detail as possible in order to reconstruct pertinent field activities without reliance on memory.

Pre-printed forms or logbooks will be used for recording sample-specific data. The data will be entered and sampling personnel will maintain custody of the forms or log books. The forms or logbooks will document observations and measurements during sample collection (see Table 4-2). Observations and measurements that will be recorded include any instrument measurements, sample descriptions, position measurements, sampling equipment, persons performing sampling, date of collection, and time of collection. All entries will be made in ink. If an incorrect entry is made, the information will be crossed out with a single strike mark.

5.5. Final Evidence Files Custody Procedures

Project documentation will be maintained at the offices of Heritage. Access to project files is limited to employees of Heritage and any contract employees involved in the closure. Pertinent documentation will also be provided to the ADEQ upon request. Complete project files will include:

- project plans and specifications;
- data records;
- relevant photographs, maps, and drawings;
- chain-of-custody documentation;
- analytical data packages provided by the testing laboratory;
- data validation reports;
- pertinent references and technical literature;
- technical reports; and
- pertinent correspondence and other information.

6. CALIBRATION PROCEDURES AND FREQUENCY

The following sections describe calibration procedures and their frequency for both field and laboratory instruments.

6.1. Field Instrument Calibration

The organic vapor analyzer (PID or FID) used for field screening soil samples (see Section 7.1) will be calibrated daily. The calibration procedures will follow standard manufacturer's instructions and procedures to ensure that the equipment is functioning properly. A standard calibration span gas will be used and the instrument span potentiometer control will be adjusted, if necessary. If the span potentiometer requires resetting, the span potentiometer will be set following the manufacturers instructions. After allowing the instrument to warm-up, an ink marker will be used to test deflection of the instrument and ensure it is working properly.

In the event field personnel experience failure of instruments, back-up or replacement instruments will be utilized to collect field data.

6.2. Laboratory Instrument Calibration

Calibration procedures for the laboratory testing being performed during closure will follow the selected ADHS-licensed laboratory's QAP for organic and inorganic constituent testing. A description of the laboratory instrumentation, standard traceability, standard sources and preparation, calibrations, instrument performance parameters, and instrument calibration criteria will be part of the QAP.

7. ANALYTICAL AND MEASUREMENT PROCEDURES

The following sections present the analytical methods and measurement procedures that will be used during closure. Soil and concrete samples will be collected during closure activities at the facility in accordance with the procedures specified in the Closure Plan and this QAPP. Samples collected during closure will be analyzed at a laboratory licensed by the ADHS.

7.1. Laboratory Analytical and Measurement Procedures

The following sections present laboratory analytical procedures and standard operating procedures for the laboratory testing being performed during closure. During implementation of this QAPP, the laboratory will utilize methods series from the most current edition of US EPA SW-846 at the time of closure.

7.1.1. List of Project Target Compounds and Estimated Quantitation Limits

A complete listing of project target compounds and estimated quantitation limits is provided in Tables 7-1, 7-2, 7-3, and 7-4. Method detection limits have been determined for the methods being performed on the instruments used at the laboratory. A discussion of method detection limit determination by the ADHS-licensed laboratory will be specified in the QAP utilized at the time of closure.

7.1.2. List of Associated QC Samples

A list of instrumental and preparation QC samples and frequency of analysis for methods performed will be specified in the QAP for the ADHS-licensed laboratory. Section 4.2 describes field QC samples that will be collected during closure.

Table 7-1
Parameters, Analytical Methods, Clean Closure Levels, and Sensitivities for Inorganic Constituents
Heritage Environmental Services, LLC
Coolidge, AZ

Parameter	Analytical Methods[1]		Clean Closure Levels[2]	Estimated Quantitation Limits[3]	
	Soils	Water	Soils/Concrete	Soils (mg/kg)	Water (mg/l)
Aluminum	6010B	6010B	76,000	5.0	0.050
Antimony	6010B	6010B	31	0.50	0.0050
Arsenic, total [4]	6010B	6010B	10	0.50	0.0050
Barium, total	6010B	6010B	15,000	1.0	0.010
Beryllium	6010B	6010B	150	0.50	0.0040
Cadmium, total	6010B	6010B	39	0.50	0.0050
Calcium	6010B	6010B		5.0	0.10
Chromium, III/VI[4]	6010B/7196A	6010B/7196A	120,000/30	1.3/1.0	0.010
Cobalt	6010B	6010B	900	1.0	0.010
Copper	6010B	6010B	3,100	1.0	0.010
Iron	6010B	6010B		2.0	0.020
Lead, total [4]	6010B	6010B	400	1.0	0.0050
Magnesium	6010B	6010		1.0	0.10
Manganese	6010B	6010	3,300	1.0	0.10
Mercury, total	7471A	7470	23	0.13	0.00020
Nickel, total	6010B	6010B	1,600	0.50	0.0050
Potassium	6010B	6010		20	0.10
Selenium, total	6010B	6010B	390	0.50	0.0050
Silver, total	6010B	6010B	390	1.0	0.010
Sodium	6010B	6010B		1.0	0.10
Thallium	6010B	6010B	5.2	0.50	0.010
Vanadium	6010B	6010B	78	1.0	0.010
Zinc	6010B	6010B	23,000	2.0	0.020
Cyanide, free	9010B/9012A	6010B	1,200	0.25	0.005

[1] Analytical method reference US EPA SW 846.
[2] The method version specified in the current edition of SW 846 at the time of closure will be used. Sample preparation methods for samples collected are as follows:
Soil Matrix – Acid digestion Preparation - ICP/FAA SW 846 3050A CVAA – SW 846 7471 (modified)
Cyanide – Distillation is US EPA SW 846 9010B
Water Matrix - Acid digestion Preparation - ICP/FAA SW 846 3005 CVAA – SW 846 7470
[3] Clean Closure Levels were obtained from A. A. C. R 18-7-205, Appendix A for Residential Soil Remediation Levels as of May 5, 2007.
EQLs are determined on a wet weight basis. The estimated quantitation limits provided are the lowest concentrations that can be reliable determined by Heritage Laboratories within specified conditions. The quantitation limits listed herein are provided for guidance and may not always be achievable. The EQLs are highly matrix dependent and matrix interferences may increase the EQLs.
[4] Arsenic clean closure level will be based on the background concentration or SRL, whichever is higher. Hexavalent Chromium may be analyzed for or may be assumed to be present at a 1:6 CrVI/CrIII if total chromium is analyzed. Lead based on IEVBK Model.

Table 7-2
Parameters, Clean Closure Levels, and Sensitivity for
Volatile Organic Constituents (SW-846 Method 8260B)(1)
Heritage Environmental Services, LLC
Coolidge, Arizona

TARGET COMPOUND LIST	CLEAN CLOSURE LEVELS(2)	ESTIMATED QUANTITATION LIMITS(3)	
Parameter	Soil/Concrete (mg/kg)	Low Level Soil/Sediment (mg/kg)	Water (mg/l)
Acetone	2100.0	0.100	0.100
Acrolein	0.10	0.05	0.05
Acrylonitrile	1.9	0.070	0.070
Benzene	0.62	0.005	0.005
Bromodichloromethane	6.3	0.005	0.005
Bromoform	560.0	0.005	0.005
Bromomethane	6.8	0.010	0.010
Carbon disulfide	7.5	0.005	0.005
Carbon tetrachloride	1.6	0.005	0.005
Chlorobenzene	65.0	0.005	0.005
Chloroethane	N/A	0.010	0.010
Chloroform	2.5	0.005	0.005
Chloromethane	12.0	0.010	0.010
Dibromochloromethane	53.0	0.005	0.005
1,3-Dichloropropene	2.4	0.005	0.005
Dichlorodifluoromethane	94.0	0.005	0.005
1,1-Dichloroethane	500.0	0.005	0.005
1,2-Dichloroethane	2.5	0.005	0.005
1,1-Dichloroethene	0.36	0.005	0.005
1,2-Dichloropropane	3.1	0.005	0.005
Ethylbenzene	1500.0	0.005	0.005
Fluorotrichloromethane	380	0.005	0.005
2-Hexanone	NA	0.050	0.050
Methylene chloride	77.0	0.005	0.005
Methyl ethyl ketone	7100.0	0.100	0.100
4-Methyl-2-pentanone	770	0.050	0.050
Styrene	3300.0	0.005	0.005
1,1,2,2-Tetrachloroethane	4.4	0.005	0.005
Tetrachloroethene	53.0	0.005	0.005
Tetrahydrofuran	NA	0.025	0.025
Toluene	790.0	0.005	0.005
1,2-Dichloroethene (total)	35	0.005	0.005
1,1,1-Trichloroethane	1200.0	0.005	0.005
1,1,2-Trichloroethane	6.5	0.005	0.005
Trichloroethene	27	0.005	0.005
Vinyl acetate	780.0	0.01	0.01
Vinyl chloride	0.016	0.010	0.010
Xylenes (total)	2800	0.005	0.005

(1) The method versions specified in the current edition of SW846 at the time of closure will be used.
(2) Clean Closure Levels were obtained from A.A.C. R 18-7-205 Appendix A for Residential Soil Remediation Levels as of December 31, 2001.
(3) EQLs are determined on a wet weight basis. The EQLs listed herein are provided for guidance and may not always be achievable. EQLs are highly matrix dependant and matrix interference may increase the EQLs.
N/A – Not Available

Table 7-3
Parameters, Clean Closure Levels, and Sensitivity for
Semivolatile Organic Constituents (SW-846 Method 8250/8270C)[1]
Heritage Environmental Services, LLC
Coolidge, Arizona

TARGET COMPOUND LIST	CLEAN CLOSURE LEVEL[2]	ESTIMATED QUANTITATION LIMITS[3]	
Parameter	Soils / Concrete	Soils[4] (mg/kg)	Water[4] (mg/l)
BASE NEUTRAL ORGANIC COMPOUNDS			
Acenaphthene	3900.0	0.33	0.010
Acenapthylene	NA	0.33	0.010
Anthracene	20000.0	0.33	0.010
Benz(a)anthracene	6.1	0.33	0.010
Benzo(a)pyrene	0.61	0.33	0.010
Benzo(b)fluoranthene	6.1	0.33	0.010
Benzo(ghi)perylene	NA	0.33	0.010
Benzo(k)fluoranthene	61.0	0.33	0.010
Benzyl Alcohol	20000.0	0.33	0.010
Benzylbutylphthalate	13000	0.33	0.010
Bis(2-chloroethoxy)methane	NA	0.33	0.010
Bis(2-chloroethyl)ether	0.43	0.33	0.010
Bis(2-chloroisopropyl)ether	25.0	0.33	0.010
Bis(2-ethylhexyl)phthalate	320.0	0.33	0.010
4-Bromophenylphenylether	NA	0.33	0.010
Carbazole	220.0	0.33	0.010
4-Chloroaniline	260.0	0.33	0.010
2-Chloronapthalene	5200	0.33	0.010
4-Chlorophenylphenylether	NA	0.33	0.010
Chrysene	610.0	0.33	0.010
Dibenz(a,h)anthracene	0.61	0.33	0.010
Dibenzofuran	260	0.33	0.010
1,2-Dichlorobenzene	1100.0	0.33	0.010
1,3-Dichlorobenzene	500.0	0.33	0.010
1,4-Dichlorobenzene	190.0	0.33	0.010
3,3'-Dichlorobenzidine	9.9	0.66	0.020
Diethylphthalate	52000.0	0.33	0.010
Dimethylphthalate	650000.0	0.33	0.010
Di-n-butylphthalate	6500	0.33	0.010
Dinitrobenzenes	6.5	0.33	0.050
2,4-Dinitrotoluene	130.0	0.33	0.010
2,6-Dinitrotoluene	65.0	0.33	.010
Di-n-octylphthalate	1300.0	0.33	0.010
Fluoranthene	2600.0	0.33	0.010
Fluorene	2600.0	0.33	0.010
Hexachlorobenzene	2.8	0.33	0.010
Hexachlorobutadiene	13.0	0.33	0.010
Hexachlorocyclopentadiene	450.0	0.33	0.010
Hexachloroethane	65.0	0.33	0.010
Indeno(1,2,3-cd)pyrene	6.1	0.33	0.010
Isophorone	4700.0	0.33	0.010
2-Methylnaphthalene	NA	0.33	0.010
Naphthalene	2600.0	0.33	0.010
2-Nitroaniline	3.9	1.6	0.050

TARGET COMPOUND LIST	CLEAN CLOSURE LEVEL[2]	ESTIMATED QUANTITATION LIMITS[3]	
Parameter	Soils / Concrete	Soils[4] (mg/kg)	Water[4] (mg/l)
3-Nitroaniline	NA	1.6	0.050
4-Nitroaniline	NA	1.6	0.050
Nitrobenzene	18.0	0.33	0.010
N-Nitroso-diphenylamine	910.0	0.33	0.010
N-Nitroso-di-n-propylamine	0.63	0.33	0.010
Phenanthrene	NA	0.33	0.010
2-Picoline	NA	1.6	0.050
Pyrene	2000.0	0.33	0.010
Pyridine	65.0	1.6	0.050
Tetrachlorobenzenes	20.0	0.33	0.010
Toluenediamine	NA	1.6	0.050
1,2,4-Trichlorobenzene	570.0	0.33	0.010
Benzoic Acid	260000.0	1.6	0.050
ACID EXTRACTABLE ORGANIC COMPOUNDS			
4-Chloro-3-methylphenol	NA	0.33	0.010
2-Chlorophenol	91.0	0.33	0.010
2,4-Dichlorophenol	200.0	0.33	0.010
2,4-Dimethylphenol	1300.0	0.33	0.010
4,6-Dinitro-2-methylphenol	NA	1.6	0.050
2,4-Dinitrophenol	130.0	1.6	0.050
2-Methylphenol	3300.0	0.33	0.010
4-Methylphenol	330.0	0.33	0.010
2-Nitrophenol	NA	0.33	0.010
4-Nitrophenol	NA	1.6	0.050
Pentachlorophenol	25.0	1.6	0.050
Phenol	39000.0	0.33	0.010
Tetrachlorophenol	20000.0	0.33	0.010
2,4,5-Trichlorophenol	6500.0	0.33	0.010
2,4,6-Trichlorophenol	400.0	0.33	0.010

(1) The method versions specified in the current edition of SW-846 at the time of closure will be used.
(2) Clean Closure Levels were obtained from A.A.C. R 18-7, (205) Appendix A for Residential Soil Remediation Levels as of December 31, 2001.
(3) EQLs are determined on a wet weight basis. The EQLs listed herein are provided for guidance and may not always be achievable. EQLs are highly matrix dependant and matrix interference may increase the EQLs.

NA – Not Available

Table 7-4
Parameters, Clean Closure Levels, and Sensitivity for
Herbicides and Pesticides (SW-846 Method 8181A/8151A)[1]
Heritage Environmental Services, LLC
Coolidge, Arizona

TARGET COMPOUND LIST	CLEAN CLOSURE LEVELS[2]	ESTIMATED QUANTITATION LIMITS[3]	
Parameter	Soil / Concrete	Soils[4] (mg/kg)	Water[4] (mg/l)
Aldrin	0.26	0.008	0.00005
Alpha-BHC	NA	0.008	0.00005
Alpha-Chlordane	3.4	0.08	0.0005
Beta-BHC	0.026	0.008	0.00005
Delta-BHC	NA	0.008	0.00005
4,4'-DDD	19.0	0.016	0.0001
4,4'-DDE	13.0	0.016	0.0001
4,4'-DDT	13.0	0.016	0.0001
Dieldrin	0.28	0.016	0.0001
Endosulfan I	390	0.008	0.00005
Endosulfan II	390	0.016	0.0001
Endosulfan Sulfate	390	0.016	0.0001
Endrin	20.0	0.016	0.0001
Endrin Ketone	NA	0.016	0.0001
Gamma-BHC (Lindane)	NA	0.008	0.0005
Gamma-Chlordane	3.4	0.08	0.0005
Heptachlor	0.99	0.008	0.00005
Heptachlor Epoxide	0.49	0.008	0.00005
Methoxychlor	330.0	0.08	0.0005
Toxaphene	4.0	0.16	0.001
2,4,5-Trichlorophenoxyacetic acid	650.0	0.020	0.001
2,4-Dichlorophenoxyacetic acid (2,4-D)	650.0	0.20	0.01
Silvex (2,4,5-TP)	NA	0.020	0.001

(1) The method versions specified in the current edition of SW-846 at the time of closure will be used.
(2) Clean Closure Levels were obtained from A.A.C. R 18-7, (205) Appendix A for Residential Soil Remediation Levels as of December 31, 2001.
(3) EQLs are determined on a wet weight basis. The EQLs listed herein are provided for guidance and may not always be achievable. EQLs are highly matrix dependant and matrix interference may increase the EQLs.
(4) The following preparation methods will be used for preparation of samples submitted for testing of herbicides/pesticides:

Herbicides	Diazomethane Herbicide Derivatization
Pesticides Solids (sonication)	SW-846 3550
Pesticides Aqueous (liquid/liquid)	SW-846 3510

NA – Not Available

8. INTERNAL QUALITY CONTROL

8.1. Field Quality Control Checks

Quality control parameters for the field activities are described in previous sections. Section 4.2 summarizes field quality control parameters. Section 7.1 provides field measurement procedures. QC procedures for field instruments include calibration of the instruments as described in Section 6.1.

8.2. Laboratory Quality Control Checks

For laboratory analyses, quality control procedures are method specific. Specific analytical methods being performed for closure are provided in Tables 7-1, 7-2, 7-3, and 7-4. The ADHS-licensed laboratory's QAP and SOPs describe internal quality control procedures for each method being performed.

9. DATA REDUCTION, VALIDATION AND REPORTING

The following sections describe data reduction activities, data validation and acceptance, and reporting of data.

9.1. Data Reduction

Data reduction will be performed by the engineering contractor and/or Heritage technical staff and the testing laboratory.

9.1.1. Field Data Reduction Procedures

After completing field activities, field-collected data will be compiled for inclusion into project files. The data generated will be checked for completeness and accuracy to ensure that all data required for each measurement is available and complete. Duplicated data will be cross checked to ensure consistency with other data developed during field activities. Pertinent data generated in the field will be tabulated for inclusion in a technical report.

9.1.2. Laboratory Data Reduction Procedures

Laboratory data reduction is performed by the testing laboratory in accordance with the ADHS-licensed laboratory's QAP and related procedures.

9.2. Data Validation

Data validation will be performed by both the ADHS-licensed laboratory and independently by the engineering contractor and/or Heritage technical staff.

1.1.1. Laboratory Data Validation

Laboratory personnel will perform a review of raw data generated during laboratory testing. Data validation by the laboratory primarily includes information associated with method performance requirements. Data reviewed by the analyst(s) include:

- calibration blanks;
- calibration verification standards used to verify calibration;
- detection limits and dilution of sample;
- instrument performance based on manufacturer specifications;
- instrument test/calibration requirements;
- quantitative, qualitative raw data generated (print-outs, graphical displays, etc.), and compound identification;
- internal reagent blanks, duplicates, and spike data; and
- quality control requirements for the method being performed.

Data generated by the analyst(s) will be reviewed by the analyst(s) to ensure that data collection meets acceptance criteria specified in the analytical method. If acceptance criteria are met, the analyst will proceed with completion of analyses (including data recordation and review). If the criteria are not met, the analyst will perform corrective action.

9.2.1. Field and Laboratory Data Validation

The engineering contractor and/or Heritage technical staff will independently validate data generated to ensure that samples were properly collected, evaluate quantitative and qualitative acceptance criteria, ensure that the data generated appears reasonable for the expected outcome (if known), and the information

generated is consistent with known site characteristics. The Project Manager, Project Geologist, or designee will be responsible for performing field and laboratory data validation. Data validation will be performed in general conformance with USEPA guidelines established for the Contract Laboratory Program with the exception of detailed analysis of instrument operational data, instrument calibration, confirmation of quantitation, and confirmation of compound identification. Internal QC procedures utilized by the laboratory will be performed in accordance with the current edition of USEPA SW-846 operating requirements and the ADHS-licensed laboratory's QAP and SOPs for the type of testing being performed to ensure that these QC criteria have been met.

Items that may be examined after receipt of analytical data include but are not limited to the following:

- Review of sample holding times for each compound class;
- Review of results from field blank and trip blanks submitted to the testing laboratory and comparison with concurrently submitted sample batches;
- Review of laboratory reagent blanks;
- Review of surrogate recoveries and matrix spike analyses;
- Review of estimated quantitation limits to ensure compliance with USEPA SW-846 guidelines;
- Evaluation of duplicates;
- General quality of data generated by the testing laboratory during closure; and
- Evaluation of data acceptance criteria for the testing performed including accuracy, precision, sensitivity, and completeness.

The following is a description of the quantitative and qualitative procedures that will be performed by the engineering contractor and/or Heritage technical staff during data validation. Table 9-1 summarizes the criteria selected for validation, the acceptance criteria, and guidelines for corrective action.

Review of Holding Times

Holding times for each compound class will be reviewed for each sample to ensure that the samples submitted were tested within prescribed holding periods for the types of compounds tested. The applicable holding times are specified on Table 4-1 of this QAPP. In addition to holding time evaluation, sample chain-of-custody will be reviewed and the condition of the samples arriving at the testing laboratory will be considered. Deviations in holding times or unusual sample handling occurrences will be noted. Corrective action may be performed for samples not meeting holding time acceptance criteria upon review of data.

Table 9-1
Data Validation Acceptance Criteria and Guidelines for Data Validation Activities
Heritage Environmental Services, LLC
Coolidge, Arizona[1],[2]

DATA VALIDATION PARAMETER	EVALUATION PROCEDURE	ACCEPTANCE CRITERIA	GUIDELINES FOR CORRECTIVE ACTION
Holding Time	Compare date of sample collection on chain-of-custody with date of analysis on laboratory reports.	Each sample should meet holding times specified in Table 4-1 of the QAPP.	Analytical results flagged as estimated concentrations or as estimated sensitivity. Samples may be collected depending on relative importance.
Field, Trip, and Method Blanks	Compare results of field, trip, and method blanks for the presence of field or laboratory contamination.	Contaminants are not present in the blanks.	Reject parameters based on criteria presented in Section 9.2.2.2 of this QAPP. Request that laboratory review data. Carefully consider type of blank, compounds present, and origin of contaminants; qualitatively evaluate data based on importance. Modify sampling procedures or laboratory SOPs.
Surrogate Spikes for Organic Compounds	Review reported percentage recovery for certain organic compounds. Review data to determine if specifications were met on initial run. Check for laboratory notes indicating difficulty with surrogate recoveries. Verify the following circumstances if necessary: 1. If any two surrogates within a semivolatile fraction were out of specification reanalysis should be performed. 2. If any surrogate for volatiles out of specification, reanalysis. 3. Recoveries of less than ten percent require reanalysis 4. Blank data out of specification requires reanalysis of samples.	For volatile organic constituents the acceptance criteria for surrogate spikes are listed on Table 8, USEPA SW-846 Method 8240. For semivolatile organic constituents the acceptance criteria for surrogate spikes are listed on Table 8 of USEPA SW-846 Method 8270. For pesticides/herbicides the acceptance criteria for surrogate spike are specified by USEPA SW-846 Methods 8080, 8150, and 8151 as criteria for developing "in-house" limits. Table 12-6 of the Heritage laboratories QAP specifies surrogate recovery criteria.	Accept data as modified. Sample results flagged as estimated values when: 1. Two semivolatile surrogates are out of specification but have recoveries greater than ten percent. 2. One volatile surrogate is out of specification but has a recovery of greater than 10 percent. 3. Sample results for a fraction should be rejected if two semi-volatile or one volatile surrogate is less than ten percent recovery and results are negative. 4. Positive sample results for a fraction should be estimated if two semivolatile or one volatile surrogate is less than 10 percent recovery. Reanalyze sample in accordance with procedures, resample and reanalyze. Review data and discuss specific results with testing laboratory in a qualitative manner to determine if reanalysis or modification of procedures should be performed to meet desired objectives.

(1) Table 9-1 is provided as guidance only. Specific determinations of data validity should be based on review of the data and circumstances associated with the samples tested and guidance regarding data validation.
(2) With the exception of field measurements, analytical methods will follow the current version of "Test Methods For Evaluating Solid Wastes" (SW-846) (current edition with updates) at the time of closure.

DATA VALIDATION PARAMETER	EVALUATION PROCEDURE	ACCEPTANCE CRITERIA	GUIDELINES FOR CORRECTIVE ACTION
Matrix Spike/ Matrix Spike Duplicate	Determine precision and accuracy of analytical procedures for matrices sampled. Determine percent recoveries for spiked samples and calculate relative percent difference for comparing matrix spikes and matrix spike duplicates using equations on Table 12-1 of this QAPP.	SEMI VOLATILE ORGANIC CONSTITUENTS: Percent Recovery: Fifth column of Table 6 in USEPA SW-846 Method 8270 Relative Percent Difference: Base Neutral Soil - RPD < 32 % Base Neutral Aqueous - RPD < 25% Acid Extractable Soil - RPD < 43 % Acid Extractable Aqueous - RPD < 45% VOLATILE ORGANIC CONSTITUENTS: Percent recovery: Fifth column of Table 6 in USEPA SW-846 Method 8240 Relative Percent Difference: Soil - RPD < 25 % Aqueous - RPD < 25%	Modify sample results by flagging data based on acceptance criteria. Qualitatively determine potential cause for not meeting specifications for percent recovery and relative percent difference. Flag for the following: 1. Estimated values for not meeting recovery criteria and relative percent difference criteria for inorganics. 2. See USEPA document entitled: Laboratory Data Validation, Functional Guidelines for Evaluation of Inorganic Analyses for further details regarding validation.
		PESTICIDES/HERBICIDES: Percent recovery: Fourth column of Table 3 in USEPA SW-846 Method 8080; Fourth column of Table 3 in USEPA SW-846 Method 8150. Third column of Table 4 in USEPA SW-846 Method 8151 METALS AND CYANIDE: Percent recovery: 75 to 100 percent unless sample concentrations exceed spike concentration by 4 times Relative Percent Difference: Soils - RPD < 35 % or RPD < quantitation limits in Table 7-1 of this QAPP if results are less than 5X of the quantitation limit Aqueous - RPD <20% or RPD < quantitation limits if results are less than 5X quantitation limit.	Review data and discuss specific results with testing laboratory in a qualitative manner to determine if reanalysis or modification of procedures should be performed to meet desired objectives. Resample for constituents that would be rejected based on analytical results. Determination based on results of samples at the same location, in the vicinity, and relative importance of the measurement. Review criteria specified in the ADHS-licensed laboratory's QAP.

(1) Table 9-1 is provided as guidance only. Specific determinations of data validity should be based on review of the data and circumstances associated with the samples tested and guidance regarding data validation.
(2) With the exception of field measurements, analytical methods will follow the current version of "Test Methods For Evaluating Solid Wastes" (SW-846) (current edition with updates) at the time of closure.

DATA VALIDATION PARAMETER	EVALUATION PROCEDURE	ACCEPTANCE CRITERIA	GUIDELINES FOR CORRECTIVE ACTION
Field Duplicates	Compare field duplicate with original result and calculate a relative percent difference for the parameter to indicate the precision of sample results using equation on Table 12-1 of this QAPP.	Acceptance criteria for evaluating precision are provided above in section describing Matrix Spike/Matrix Spike Duplicates See Section 9.2.2.5 for additional discussion of acceptance criteria	For corrective action guidelines see section describing corrective action for matrix spike/matrix spike duplicates
Sensitivity/Estimated Quantitation Limits	Compare the analytical results for each parameter with the method sensitivity for each parameter provided on Tables 7-1, 7-2, 7-3, and 7-4 of this QAPP.	Positive results are above the lowest estimated quantitation limit provided in Tables 7-1, 7-2, 7-3, and 7-4 of this QAPP. If dilution is required as a result of matrix interference the estimated quantitation limits will be adjusted by the laboratory and the lowest estimated quantitation limits may not be achievable.	Concentrations reported below the estimated quantitation limit will be "BDL" or below detection limits for samples that do not require dilution. For samples requiring dilution, values reported between the lowest estimated quantitation limit on Table 7-1, 7-2, 7-3, and 7-4 and the reported estimated quantitation limit should be flagged as estimated. Review sensitivity data and discuss specific results with testing laboratory in a qualitative manner to determine if reanalysis or modification of procedures should be performed to meet desired objectives. Resample for constituents that would be rejected based on sensitivity. Determination based on results of samples at the same location, in the vicinity of the sample, and relative importance of the measurement.
General Quality of Data	Qualitatively evaluate the performance of the laboratory based on completeness evaluation, the quality of data generated, and other intangible factors. Summarize qualitative evaluation in writing. Calculate completeness of data using equation on Table 12-1 of this QAPP.	Completeness of data should range between 90 and 100 percent complete.	Review completeness data and discuss results with testing laboratory in a qualitative manner to determine if reanalysis or modification of procedures should be performed to meet desired objectives.

(1) Table 9-1 is provided as guidance only. Specific determinations of data validity should be based on review of the data and circumstances associated with the samples tested and guidance regarding data validation.
(2) With the exception of field measurements, analytical methods will follow the current version of "Test Methods For Evaluating Solid Wastes" (SW-846) (current edition with updates) at the time of closure.

Review of Blank Data

Blank data (field, trip, or method) will be compared with data provided for each sample batch submitted with a particular blank. Data will be rejected from further consideration for common laboratory constituents if the sample result is less than or equal to ten times the highest result reported in the blank analysis. For samples containing constituents ten times greater than that reported in blanks, validity of the samples will be determined on a case-by-case basis. Similarly, the presence of common laboratory constituents will be evaluated on a case-by-case basis depending on frequency of detection and the quantitation level reported. Common laboratory contaminants could include, among others:

- methyl ethyl ketone;
- methylene chloride;
- phthalate esters;
- toluene; and
- acetone.

Data will be rejected for other constituents detected if the sample result for a particular constituent is less than or equal to five times the highest result reported in the blank analysis. For samples with constituent concentrations five times greater than that detected in the blanks, validity of the samples will be determined on a case-by-case basis.

Suspected contamination of samples as a result of blank evaluations will be noted in the data validation reports and on tabulations of data. Sample results will be presented as reported with a note. Sample results will not be corrected by subtracting the blank value from a sample result.

Review of Spike Data

Surrogate recoveries (for volatile organic, semi-volatile organic, and pesticide/herbicide constituents) and spike recoveries will be examined to determine if the reported results are within USEPA SW-846 guidelines for the constituent being evaluated. Surrogate spike recoveries outside the control limits will be noted. Explanations, if available, will be provided for the surrogate spike recoveries not reported within the range specified in USEPA SW-846. Table 9-1 provides acceptable surrogate spike recovery ranges. Section 12 provides the equation used to calculate percent recovery for spikes.

Matrix spike and matrix spike duplicate testing will be performed on samples collected during closure. The percent recoveries will be compared to published USEPA SW-846 recommendations for percent recovery. The relative percent difference will be calculated for the matrix spike/matrix spike duplicate using the equation provided in Section 12. Table 9-1 provides acceptance criteria for the relative percent difference in each media.

Deviation from the acceptance criteria for percent recoveries and relative percent difference will be noted in the data validation report and on tabulations of data contained in technical reports. Acceptance, qualification, or rejection of data will be determined on a case-by-case basis depending on the end use of the data.

Review of Estimated Quantitation Limits

Estimated quantitation limits (EQL), or estimated quantitation limits as applicable for each organic and inorganic constituent to be tested are listed on Tables 7-1, 7-2, 7-3, and 7-4. The EQL provided in the tables represents the lowest EQL to be reported for each constituent by the ADHS-licensed testing laboratory. Any value for a particular constituent reported below the EQL listed in Tables 7-1, 7-2, 7-3, and 7-4 will be considered invalid and below detection limits or "BDL."

Although not anticipated, matrix interferences from organic and inorganic constituents could occur. If warranted, the EQL will be adjusted using a multiplier In accordance with USEPA SW-846 recommendations for the method being performed. During validation of data, matrix interferences will be noted in the data validation report or on tabulations of data, if warranted. An appropriate data qualifier may be added to the data in the event the qualifier is warranted.

Review of Field Duplicate Analyses

As part of field QC, field duplicate samples will be collected and submitted to the testing laboratory. The field duplicate data will be validated based on the presence or absence of the constituent in each sample and the relative percent difference between duplicate analyses. The acceptance criteria for the field duplicates are summarized on Table 9-1. Results will be appropriately noted if the field duplicate does not meet the acceptance criteria.

In addition, sample results will be considered "below detection limits" or not detected if either the sample or the field duplicate detect a compound that is not detected in the other sample particularly if the reported concentration is at or below the EQL. These circumstances will be reported in the data validation report.

General Quality of Data

A discussion of the data quality for analytical results received from the testing laboratory will be provided after completing data validation. Information concerning unusual requirements or circumstances surrounding the testing of the samples may be provided by the laboratory. The quality of data will also be evaluated by calculation of a percent completeness for the entire analytical data package. The goal for completeness is 100 percent. Realistically, the estimated percent complete should be in the range between 90 and 100 percent. Equations for calculating completeness are provided in Section 12.

9.3. Data Reporting

Laboratory analysis reports and supporting documentation will be provided by the testing laboratory to Heritage and the engineering contractor. The laboratory will archive all data in a variety of storage media in accordance with the procedures of the ADHS-licensed laboratory's QAP. The information submitted by the laboratory will include the following where applicable to the testing being conducted:

- certificates of analysis, including analytical results, sampling dates, analysis dates, analytical methods used, and estimated quantitation limits (EQLs);
- quality assurance reports, including method blank results, matrix duplicate results (as applicable), matrix spike/matrix spike duplicate (MS/MSD) results,

laboratory control samples, surrogate recoveries, method blanks, and laboratory control samples;
- signed chain-of-custody forms;
- tuning results (GC-MS);
- initial and continuing calibration results;
- method of standard addition (ICP) or serial dilution analysis (ICP), as applicable; and
- internal standard areas as applicable.

Raw data consisting of chromatograms, recorder outputs, mass spectrum reports, computer printouts, charts, graphs, bench sheets, or any other hard copy data generated during sampling and analysis will be provided upon written request for a period of three years from the date of analysis.

Upon receipt of reports, the data will be validated by the engineering contractor and/or Heritage technical staff. The data will be tabulated for inclusion in technical reports. Laboratory analysis reports, chain-of-custody records, and the validation reports will be provided in technical reports regarding closure.

9.4. Data Management

A significant amount of data could be generated during final closure of the facility. To ensure effective data management, the following data management plan will be implemented to document and track investigation data and results.

All data will be recorded and managed through the use of field records such as chain-of-custody and sample log books. Chain-of-custody forms as shown in Figure 4-4 will be included in technical reports regarding closure. The field records, which will serve as a record of activities taking place during the sample collection process, will be completed by the designated sampling personnel and will be maintained in Heritage's files. Information recorded in the field records will include data listed in Table 4-2, as well as locations of soil samples, depth intervals for soil samples, sampling procedure modifications (if required), sample identification numbers, field measurements, descriptions of samples, and other pertinent activities or occurrences encountered during sample procurement activities.

As described in Section 4.1.1 of this QAPP, the samples will be identified on the basis of a uniquely assigned alpha numeric code to ease sorting of data from each unit undergoing closure. This will serve to distinguish samples from different matrices, to distinguish depth intervals, and to distinguish possible multiple sampling events from similar sampling locations. The testing laboratory will also assign a unique, sequential alpha-numeric code to each sample received for analysis.

Analytical data will be summarized and presented in tabular format for each medium sampled or each analytical constituent, as appropriate. Data may also be sorted on the basis of other factors including, location, depth, stratigraphic horizon, and/or hazardous waste management unit. Applicable QA/QC sample results will be tabulated along with analytical data for comparative purposes. A summary of potential data presentation methods is provided in Table 9-2. Laboratory analysis reports, QA/QC data, data validation summaries, and data collection forms will be included with technical reports.

Table 9-2
Potential Data Presentation Methods
Heritage Environmental Services, LLC
Coolidge, Arizona

Tabular Displays

Analytical Data

- List of constituents of concern and other monitoring parameters
- Display sorted results
- Compare study and background data
- Data reduction for statistical analysis
- Summary data

Graphical Displays

Display Site Features

- Layout and topography
- Sampling locations and sampling grids
- Boundaries of sampling area

10. PERFORMANCE AND SYSTEM AUDITS

Performance and systems audits of both field and laboratory activities will be conducted to verify that sampling and analysis are performed in accordance with the procedures established in this QAPP. Performance and systems audits will be performed by the testing laboratory and the project manager. The following sections describe the performance and systems audit requirements established for closure.

10.1. Field Performance and Systems Audits

The Project Manager will perform a continual audit of the data as it is generated or provided to the Project Manager for completeness and compliance with this QAPP. The Project Manager will have overall responsibility for ensuring that work is checked for completeness and compliance with this QAPP either by actually performing the auditing function or delegating the authority to qualified personnel based on the complexity of the auditing function. The Project Manager will conduct an evaluation of sample collection activities at the beginning of the project. Personnel performing activities associated with the project will be instructed to check the work that they are responsible for and ensure that checks are performed for pertinent calculations, tabulations of data, and other technical work products.

Technical reports and pertinent technical correspondence prepared by the Project Manager will be internally reviewed by personnel preparing the documents as well as the Project Manager. The final work product will be reviewed by the Project Manager for completeness, compliance of data generated with this QAPP, technical content, and conclusions.

Data completeness and compliance with this QAPP will be determined by reviewing all data generated in the field including field forms, reviewing chain-of-custody records, laboratory data packages, performing data validation activities, and reviewing other pertinent data to ensure that data generated during closure is complete and in compliance with this QAPP. Final reports will be checked to ensure that pertinent data generated in the reports are correctly presented in the report or incorporated into appendices.

10.2. Laboratory Performance and Systems Audits

The internal performance audit procedure of the ADHS-licensed laboratory will be described in the laboratory's QAP.

11. PREVENTIVE MAINTENANCE

Preventive maintenance is an ongoing activity that will be performed during closure. Generally, preventive maintenance will be performed as specified by the manufacturer of the equipment or in accordance with the procedures being performed during closure.

11.1. Field Instrument Preventive Maintenance

Field instruments used during closure will be maintained in general conformance with the manufacturer's recommendations. Individuals performing field activities will follow manufacturer's instructions for calibration and maintenance of the equipment. If the equipment is faulty, it will be decontaminated and repaired in the field or replaced with back-up equipment prior to performing additional testing. If required, faulty equipment will be decontaminated and returned to the manufacturer for repair.

11.2. Laboratory Preventive Maintenance

The ADHS-licensed laboratory will have a continuous preventive maintenance program in place. Section 10 of the Heritage Laboratories QAP summarizes preventive maintenance performed for a variety of laboratory equipment. Instruments for analyzing for metals, cyanide, volatile organic constituents, semi-volatile organic constituents, and pesticides/herbicides are of interest. In addition to routine preventive maintenance, method-specific USEPA SW-846 requirements for preventive maintenance will be performed. The analytical methods to be utilized during closure are provided on Tables 7-1, 7-2, 7-3, and 7-4 of this QAPP.

12. SPECIFIC ROUTINE PROCEDURES USED TO ASSESS DATA PRECISION, ACCURACY, AND COMPLETENESS

The following sections describe the procedures and equations that will be used in assessing the accuracy, precision of analytical data, and completeness of data collection associated with closure.

12.1. Accuracy of Analytical Data

Accuracy is defined as the degree of conformity of a measurement to a true value or known standard. Analytical data will be assessed for accuracy by evaluating percentage recovery for various spiked samples. The accuracy will be calculated for matrix spikes, matrix spike duplicates, and internal laboratory spikes. Spikes will be utilized to provide project specific accuracy evaluation for the media sampled at the facility. Table 12-1 provides the equation to be used to calculate the percent recoveries when evaluating accuracy. Acceptance criteria for evaluation of spike data are provided in Table 9-1.

12.2. Precision of Analytical Data

Precision for the testing will be evaluated by calculating relative percent differences for matrix spike/matrix spike duplicate results and field duplicate testing of samples. Precision is defined as the degree of refinement or reproducibility of a particular measurement. Field duplicates will serve to evaluate test results from two samples at the same location. Acceptance criteria for evaluation of precision are provided in Table 9-1. The equation to be used to calculate relative percent difference is provided in Table 12-1.

12.3. Completeness Assessment

Generally, completeness will be assessed by evaluation of valid data generated during the project versus data not meeting QC requirements established in this QAPP. Completeness for each sample is defined as meeting all QA/QC requirements evaluated during data validation for each parameter tested. The measure of completeness for each parameter will consider whether:

- A valid result is obtained for each parameter tested without rejection of the data (e.g., accuracy and precision acceptance criteria for each constituent are met);
- All chain-of-custody requirements for each parameter are satisfied;
- Holding time established for each parameter is met;
- Data subject to blank evaluation will be considered; and
- Sensitivity requirements are met (excluding analytical interferences requiring dilution of samples).

The equation for calculating completeness is provided in Table 12-1. The use of completeness will serve as a measure for assessing the success of the sampling event(s). However, final evaluation of the data will be qualitative based on the relative degree of importance that the sample represents in order to meet the project objectives.

Table 12-1
EQUATIONS USED TO DETERMINE ACCURACY, PRECISION, AND COMPLETENESS OF DATA
HERITAGE ENVIRONMENTAL SERVICES, LLC

ACCURACY

SPIKE RECOVERY IN PERCENT

$[(S_s - S_o)/C_s]\ 100$ = percent spike recovery, where

S_s = Concentration of analyte in analyzed spiked sample
S_o = Concentration of analyte in unspiked sample
C_s = Concentration of analyte spike

SURROGATE SPIKE RECOVERY IN PERCENT

$(S_{sur}/C_{sur})\ 100$ = percent surrogate recovery, where

S_{sur} = Concentration of surrogate in analyzed sample
C_{sur} = Concentration of surrogate

PRECISION

RELATIVE PERCENT DIFFERENCE IN PERCENT

$\{(|X_1 - X_2|)/[(X_1 + X_2)/2]\}\ 100$ = relative percent difference, where

X_1 = Concentration measured in sample or matrix spike
X_2 = Concentration measured in sample or matrix spike duplicate

Note: For values that are below detection limits or BDL, the practical quantitation limit will be used to calculate relative percent difference if one of the samples reports a value.

COMPLETENESS IN PERCENT

$(x/y)100$ = percent complete, where

x = the number of valid measurements after data validation
y = the number of possible measurements prior to performing analysis

Note: See section 12.3 for identification of measurements

13. CORRECTIVE ACTION

An important aspect to ensure that the objectives are met will be corrective action. Heritage intends to minimize the amount of corrective action required during closure by utilizing trained professionals during field and laboratory testing; adhering to Closure Plan requirements, this QAPP, and SOPs; continually reviewing data generated in the laboratory and field; and performing independent review of data through internal laboratory procedures and data validation activities.

13.1. Corrective Action during Field and Data Validation Activities

In certain instances, corrective action may be necessary when a sample network requires changes, sampling locations are adjusted, sampling procedures are changed, or analytical procedures are different from those specified in this QAPP. These changes may be in response to unexpected conditions at the facility.

If non-conformance with the established quality control procedures is identified in the field or laboratory, measures will be taken to correct the non-conformance using this QAPP's guidelines, established SOPs, or alternative corrective action procedures.

After identification of a non-conformance or determination that data is not useful, corrective action will be performed, if possible. Corrective action that may be performed includes:

- Use of back-up or replacement equipment;
- Recalibration of field instruments;
- Reanalysis of out of control samples;
- Recollection of samples;
- Modification of plans as necessitated by field conditions;
- Corrections to calculations, drawings, tabulations through review and audit process;
- Acceptance of data while acknowledging the non-conformance;
- Revision of project objectives, sampling procedures, or analytical procedures to obtain the desired data quality or meet the project objectives; or
- Additional training for field and laboratory personnel.

Depending on the identified non-conformance, the nature and extent of corrective action will be contingent on the qualitative degree of non-conformance (e.g., corrections for minor calculation errors versus breakage of an entire set of samples), technical issues associated with non-conformance (e.g., did matrix interferences during analysis cause a loss of sensitivity that cannot be corrected?), and the importance of any particular data measurement (e.g., loss of data at a critical sample location or loss of field measurement data where analytical data is collected).

Personnel performing work during closure will be responsible for corrective action. After identification, the group leaders and QA/QC personnel will be responsible for performing corrective action at the testing laboratory. The Project Manager or designee will perform corrective action as warranted when non-conformance is identified. The Project Manager will be responsible for ensuring that corrective action is performed in the field and in the testing laboratory.

13.2. Laboratory Corrective Action

Laboratory corrective action will be as described in the ADHS-licensed laboratory's QAP.