

# Solid Waste Management Unit Building 43 Closure Report



*Prepared for:*

Camp Stanley Storage Activity  
Boerne, Texas

April 2005





### LIST OF FIGURES

Figure BLDG43-1	Site Location Map.....	See SWMU Bldg 43 RFI Report or Appendix F
Figure BLDG43-2	Soils and Topographic Map.....	See SWMU Bldg 43 RFI Report or Appendix F
Figure BLDG43-3	Geologic Setting .....	See SWMU Bldg 43 RFI Report or Appendix F
Figure BLDG43-4	Sample Location Map.....	See SWMU Bldg 43 RFI Report or Appendix F
Figure BLDG43-5	In-Phase Electromagnetic Data.....	See SWMU Bldg 43 RFI Report or Appendix F
Figure BLDG43-6	Quadrature Electromagnetic Data.....	See SWMU Bldg 43 RFI Report or Appendix F
Figure BLDG43-7	Building 43 Historical Aerial Photographs .....	See SWMU Bldg 43 RFI Report Addendum or Appendix F
Figure BLDG43-8	Surface Soil Sample Location Map .....	See SWMU Bldg 43 RFI Report Addendum or Appendix F
Figure BLDG43-9	Closure Sample Location Map .....	2-4

### LIST OF TABLES

Table BLDG43-1	Summary of Chemical Constituents Detected in Soil Gas, November-December 1995.....	See SWMU Bldg 43 RFI Report or Appendix F
Table BLDG43-2	Summary of Chemical Constituents Detected in Soil Gas, August 1996.....	See SWMU Bldg 43 RFI Report or Appendix F
Table BLDG43-3	Summary of Chemical Constituents Detected in Soil, March 2000.....	See SWMU Bldg 43 RFI Report or Appendix F
Table BLDG43-4	Summary of Chemical Constituents Detected in Subsurface Soil, March 2000.....	See SWMU Bldg 43 RFI Report or Appendix F
Table BLDG43-5	SWMU Building 43 Waste Characterization Results.....	2-5
Table BLDG43-6	SWMU Building 43 Closure Confirmation Sampling Results.....	2-6

### APPENDICES

Appendix A	Analytical Results Summary
Appendix B	Waste Manifests
Appendix C	Evaluation of Data Quality Objectives Attainment
Appendix D	Data Verification Reports
Appendix E	Statistical Analysis
Appendix F	RFI and RFI Addendum Figures and Tables

## SECTION 1 INTRODUCTION

On May 5, 1999 an Administrative Consent Order was issued to Camp Stanley Storage Activity (CSSA) pursuant to §3008(h) of the Solid Waste Disposal Act (SWDA), as amended by Resource Conservation and Recovery Act (RCRA), and further amended by the Hazardous and Solid Waste Amendments (HWSA) of 1984. In accordance with the RCRA Facility Investigation (RFI) requirements of the Consent Order, an RFI report for Solid Waste Management Unit (SWMU) Building (Bldg) 43 was completed in December 2002 to document the environmental condition of the site and site closure requirements, and recommend further investigation. This closure report includes by reference the information presented in the **SWMU Bldg 43 RFI Report** (Parsons, 2002) and the **SWMU Bldg 43 RFI Report Addendum** (Parsons, 2003).

The **SWMU Bldg 43 RFI Report** recommended excavation and disposal of site surface soils to meet closure requirements. The RFI addendum report estimated up to 1,100 cubic yards (CY) of soil would require removal. For analytes exceeding closure standards during the RFI, confirmation sampling was to be conducted to confirm that the site achieved closure requirements. This report documents the closure activities at SWMU Bldg 43.

This closure work was performed by Parsons under the U.S. Air Force Environmental Remediation and Construction (ENRAC) Contract F41624-01-D-8544, Task Order 19 (TO 0019). The Air Force Center for Environmental Excellence (AFCEE) provided technical oversight for the task order. Based upon the project statement of work (SOW), a set of work plans was established to govern the field work. These include:

- Work Plan Overview (Volume 1-1, TO 0019 Addendum);
- Site-Specific Work Plans (Volume 1-2, SWMU Bldg 43);
- Field Sampling Plan (Volume 1-4, TO 0019 Addendum); and
- Health and Safety Plan (Volume 1-5, TO 0019 Addendum).

Closure activities at SWMU Bldg 43 were conducted between July 2004 and April 2005. As recommended in the RFI report, excavation and disposal activities were conducted. Approximately 580 CY of soil and waste material were excavated and removed from the site. Confirmation sampling was conducted to verify that metals concentrations for arsenic, cadmium, barium, chromium, copper, nickel, zinc, mercury, and lead were below background levels. These metals were found to exceed closure standards during the RFI investigation.

For this closure report, Section 1 provides the site-specific background and describes the selected closure standard. Section 2 describes the closure actions and the closure evaluation. Section 3 summarizes the findings, evaluates attainment of data quality objectives (DQOs), and certifies the site closure. References cited in this report can be found in the **Bibliography (Volume 1-1 of the Environmental Encyclopedia)**.

### 1.1 CLOSURE STANDARD

As described in **Section 4.3 of the Risk Assessment Technical Approach Document (Volume 1-6)**, CSSA has opted to pursue closure of SWMU Bldg 43 under the Risk Reduction

Rules (RRR), as defined by 30 Texas Administrative Code (TAC) §335. A notification of intent to close sites identified to date, including SWMU Bldg 43, was sent to the Texas Commission on Environmental Quality (TCEQ) in accordance with the RRR on July 12, 1999. TCEQ acceptance of this notification was received on October 5, 1999.

Following the RRR guidelines (30 TAC §335.554), if site concentrations are at or below background, and all waste and waste residue have been removed, then the site can be closed under Risk Reduction Standard 1 (RRS1). CSSA background levels are the RRS1 criteria for inorganic compounds (metals) concentrations and laboratory reporting limits (RLs) are the RRS1 criteria for organic compounds. Based on the RFI sampling results at SWMU Bldg 43, CSSA opted to clean the site to background levels and pursue closure under RRS1. If closure requirements under RRS1 are attained and approved by the TCEQ Executive Director, then CSSA is released from the deed recordation requirement.

## 1.2 BACKGROUND AND SITE DESCRIPTION

### 1.2.1 CSSA

General information regarding the history and environmental setting of CSSA is located in the **CSSA Environmental Encyclopedia (Volume 1-1, Background Information Report)**. In that report, data regarding the geology, hydrology, and physiography are also available for reference.

### 1.2.2 SWMU Bldg 43

#### 1.2.2.1 Site Description

SWMU Bldg 43 was previously used as a makeshift ammunition demolition facility. The site included a small building and the adjacent area. The building was a 10 foot by 10 foot, three-walled structure made of cinder blocks. A small brick and steel furnace was located at the back of the building.

Initial site visits to SWMU Bldg 43 revealed that ammunition had been burned inside the furnace, and that metal debris, fuses, shotgun shells, and casings had been scattered across the ground surface at the site. Large sections of the site were covered in molten conglomerations of bomb fuses, bullets, spent casings, and other unidentified metal pieces. One large section of debris led away from the back of the building towards the western edge of the site. Another section of debris was located near the trees at the northern edge of the site. Additional scattered metal pieces surrounded the building. Historical aerial photographs of the site can be seen in **Figure BLDG43-7 of the SWMU Bldg 43 RFI Report Addendum** and in **Appendix F** of this report.

Background information regarding the location, size, and known historical use of the site is also included in the **Environmental Encyclopedia (Volume 1-2, SWMU Bldg 43)**. **Volume 1-2** also includes a **Chronology of Actions** and a **Site-Specific Work Plan for SWMU Bldg 43**.

### 1.2.2.2 Potential Sources of Contamination

Because of its use as an ammunition demolition facility and its proximity to the SWMU B-3 and O-1 volatile organic compound (VOC) source areas, the initial potential contaminants of concern (COCs) were VOCs, semivolatile organic compounds (SVOCs), metals, explosives, dioxins, and furans.

RFI sampling at SWMU Bldg 43 was conducted during February and March 2000. Samples were collected for VOCs, SVOCs, metals (arsenic, barium, cadmium, chromium, mercury, lead, nickel, zinc, and copper), explosives, dioxins, and furans. No SVOCs or explosives were detected. Four VOCs were detected at levels that slightly exceeded RRS1 criteria, but these VOCs are considered laboratory-type contaminants and their results are attributed to laboratory contamination since there are no sources for these VOCs at SWMU Bldg 43. Dioxins and furan wipe samples collected inside the furnace showed these COCs are below RLs. All metals that were sampled for exceeded the RRS1 criteria for SWMU Bldg 43 soils. These sample results are included in the **SWMU Bldg 43 RFI Report** and in **Appendix F** of this report.

Additional sampling was conducted at SWMU Bldg 43 in March 2003 to define the horizontal extent of metals contamination. Samples were analyzed for the nine metals that exceeded RRS1 during the RFI sampling. The additional samples showed that all metals exceeded RRS1 except arsenic, chromium, and nickel. These sample results are included in the **SWMU Bldg 43 RFI Report Addendum** and in **Appendix F** of this report.

### 1.2.2.3 Site Location

SWMU Bldg 43 is located next to a dirt road in the northeast corner of the Inner Cantonment, approximately 800 feet from the western boundary of CSSA (**Figure BLDG43-1** of the **SWMU Bldg 43 RFI Report** and **Appendix F** of this report). SWMU B-10 is 25 feet to the west. SWMU B-19 and Area of Concern (AOC) 36 (AOC-36) are approximately 140 feet to the west, SWMU Oxidation Pond (O-1) is approximately 240 feet to the south, SWMU B-28 is approximately 270 feet to the west, and SWMU B-3 is approximately 375 feet to the north-northwest.

## 1.3 SITE ENVIRONMENTAL SETTING

A detailed description of the site environmental setting is provided in the **CSSA Background Information Report (Volume 1-1)** and the **SWMU Bldg 43 RFI Report** (Parsons, 2002). A summary of the site environmental setting is provided in the paragraphs below.

### 1.3.1 Site Soils and Topography

The soils at SWMU Bldg 43 are gently undulating Tarrant Association soils (**Figure BLDG43-2** in the **SWMU Bldg 43 RFI Report** and **Appendix F** of this report). The gently undulating Tarrant Association soils comprise approximately 14.3 percent of CSSA and are typical of prairie and plateau topography. They occur in areas that do not have streams. Generally, gently undulating Tarrant Association soils are dark colored, very shallow, calcareous, and clayey. These soils are best suited for native grasses and range use. At SWMU

Bldg 43, the gently undulating Tarrant Association soils are from 3 to 10 feet thick. Detailed descriptions of all the CSSA soil types are provided in the CSSA **Environmental Encyclopedia (Volume 1-1, Background Information Report, Soils and Geology)**.

The ground surface at SWMU Bldg 43 slopes to the west-southwest toward Salado Creek, and the site is situated at an elevation of approximately 1,240 feet above mean sea level (msl). There are no changes in topography in the immediate vicinity of SWMU Bldg 43, and no ditches or trenches or intermittent streambeds are in the immediate vicinity of SWMU Bldg 43. Salado Creek flows southward and is located approximately 600 feet southwest of SWMU Bldg 43.

### 1.3.2 Geology

The Upper Glen Rose Limestone is the uppermost geologic stratum in the area of SWMU Bldg 43 (**Figure BLDG43-3 of the SWMU Bldg 43 RFI Report and Appendix F** of this report). The Upper Glen Rose consists of beds of blue shale, limestone, and marly limestone, with occasional gypsum beds. Generally, it outcrops in stream valleys and at the ground surface. The thickness of the Upper Glen Rose is estimated to be between 20 and 150 feet at CSSA. It is underlain by the Lower Glen Rose Limestone, which is estimated to be 300 feet thick at CSSA. The Lower Glen Rose is a massive, fossiliferous, and vuggy limestone that grades upwards into thin beds of limestone, marl, and shale. The Lower Glen Rose is underlain by the Bexar Shale (regionally known as the Hensell Shale), which is from 80 to 150 feet thick at CSSA. The Bexar Shale consists of silty dolomite, marl, calcareous shale, and shaley limestone. The geologic strata dip approximately 10 to 12 degrees to the south-southeast at CSSA.

Based on current published information, there are two known major fault (shatter) zones at CSSA: the North Fault Zone and the South Fault Zone. SWMU Bldg 43 is located within the North Fault Zone, between a series of faults trending northeast/southwest (**Figure BLDG43-3 of the SWMU Bldg 43 RFI Report and Appendix F** of this report).

### 1.3.3 Hydrology

At CSSA, the uppermost hydrogeologic layer is the unconfined Upper Trinity Aquifer, which consists of the Upper Glen Rose Limestone. Locally at CSSA, low-yielding perched zones of groundwater can exist in the Upper Glen Rose; however, no groundwater was encountered in any of the SWMU Bldg 43 soil borings. Principal recharge into the Middle Trinity aquifer is via precipitation infiltration at outcrops. In general, groundwater at CSSA flows in a north to south direction, with some seasonal fluctuations.

The nearest surface water feature is Salado Creek, which is approximately 600 feet southwest of SWMU Bldg 43 (**Figure BLDG43-2 of the SWMU Bldg 43 RFI Report and Appendix F** of this report). Salado Creek is an intermittent stream that flows to the south, and exits the southeast portion of CSSA.

### 1.3.4 Cultural Resources

Cultural resources are prehistoric and historic sites, structures, districts, artifacts, or any other physical evidence of human activity considered important to a culture, subculture, or community for scientific, traditional, or religious purposes. Bldg 43 is considered a historic structure, but was demolished during November 2004 to facilitate remediation of the site. Texas





6.1 micrograms per liter ( $\mu\text{g/L}$ ) and occurred at a location approximately 275 feet north of SWMU Bldg 43 (location 1,1). Complete results for this survey are provided in **Table 9.1** of the **Technical Memorandum on Soil Gas Surveys** (Parsons ES, 1995).

Based on the results of the July 1995 survey, an additional survey of the area between SWMU B-3 and the O-1 was conducted in November and December 1995. Twenty-four additional soil gas points were analyzed for *cis*-1,2-DCE, PCE, TCE, and carbon tetrachloride. The closest samples to SWMU Bldg 43 included locations G,13; G,14; G,15; I,13; I,15; I,16; and J,16 which are shown on **Figure BLDG43-4** of the **SWMU Bldg 43 RFI Report**. PCE was the only analyte detected in soil gas at these locations, and concentrations ranged from 0.05  $\mu\text{g/L}$  to 0.43  $\mu\text{g/L}$ . The highest concentration, 0.43  $\mu\text{g/L}$ , was detected at location I,16; which is located approximately 75 feet south of the area designated as SWMU Bldg 43. Complete results from the November/December 1995 soil gas survey are included in **Table BLDG43-1** of the **SWMU Bldg 43 RFI Report** and **Appendix F** of this report.

On August 23, 1996, seven additional soil gas samples were collected and analyzed for BTEX, *cis*-1,2-DCE, TCE, 1,1,1-trichloroethane (TCA), and PCE. The August 1996 samples included locations A,0; A,1; A,2; B,0; B,1; B,2; and #7. PCE and TCE were the only target compounds detected. PCE occurred at concentrations of 0.04 to 1.0  $\mu\text{g/L}$  with the highest concentration occurring at location B,2. Location B,2 is also the only location where TCE was detected; the concentration was 0.04  $\mu\text{g/L}$ . Since concentrations within the SWMU Bldg 43 boundary are lower, the data suggest that SWMU O-1 or SWMU B-3 is the source of the PCE contamination in the area. A definitive site-specific source of PCE does not appear to be present at SWMU Bldg 43 because a distinct soil gas source pattern was not detected. Results are provided in **Table BLDG43-2** of the **SWMU Bldg 43 RFI Report** and **Appendix F** of this report. Sample locations are shown on **Figure BLDG43-4** of the **SWMU Bldg 43 RFI Report**.

### 1.4.3 Surface/Subsurface Samples

Six soil borings were advanced between February 29 and March 1, 2000 to characterize surface and subsurface soils at SWMU Bldg 43. The locations of the borings are shown in **Figure BLDG43-4** of the **SWMU Bldg 43 RFI Report** and **Appendix F** of this report.

Samples were collected from the surface (0.5 to 1.0 feet below ground surface [bgs]) and two additional depths (20 total samples were collected including field duplicates). Samples obtained from depths of 0.5 to 1 feet bgs, with the exception of the sample from BLDG43-SB02, are representative of gently undulating Tarrant Association soils. Samples collected at greater depths within the borings consist of materials representative of the Upper Glen Rose Limestone. Samples were analyzed for VOCs, explosives, barium, chromium, copper, nickel, zinc, arsenic, cadmium, lead, and mercury. Three surface soil samples were also analyzed for SVOCs.

The VOCs methylene chloride, dichlorodifluoromethane, ethylbenzene, and toluene were detected above RRS1 criteria in surface and subsurface samples. Ethylbenzene, dichlorodifluoromethane, and toluene only exceeded RRS1 in one sample, BLDG43-SB02 (8.5-9 feet bgs), at very low concentrations. Methylene chloride exceeded RRS1 in 15 samples (including field duplicates), with concentrations ranging from 0.0054 to 0.1872 milligrams per kilograms (mg/kg). The RL for methylene chloride is 0.005 mg/kg. Methylene chloride and dichlorodifluoromethane are likely associated with laboratory contamination since they are

common laboratory contaminants, were detected a low concentrations, and there are no potential sources at the site. Although ethylbenzene and toluene were detected above RRS1, the concentrations are very low and there is also no source for these contaminants based on the site history. All other detected VOCs were below RRS1 standards.

Elevated metals concentrations were detected in five surface samples, but no subsurface samples. Every metal that was analyzed for exceeded RRS1 in one or more samples. No SVOCs or explosives were detected in any of the samples. **Table BLDG43-3** presents a complete summary of the detected constituents.

As recommended in the **SWMU Bldg 43 RFI Report**, additional surface soil samples were collected during March 2003 to delineate the horizontal extent of metals contamination at the site. Ten samples were collected and analyzed for barium, chromium, copper, nickel, zinc, arsenic, cadmium, lead, and mercury.

Metals were detected above RRS1 criteria (background) in each of the surface soil samples. All metals except arsenic, chromium, and nickel exceeded RRS1 criteria. The sample locations and sample results are presented in **Figure BLDG43-8** and **Table BLDG43-4** of the **SWMU Bldg 43 RFI Report Addendum** and **Appendix F** of this report.

**THIS PAGE INTENTIONALLY LEFT BLANK**

## SECTION 2 CLOSURE ACTIVITIES

Based on the RFI sampling results, closure of SWMU Bldg 43 required excavation and disposal of waste residue present at the site and confirmation sampling to ensure that all waste residue was removed. These closure activities are described in this section.

### 2.1 EXCAVATION AND DISPOSAL

Excavation of waste and waste residue at SWMU Bldg 43 was conducted from July 2004 to March 2005. Excavation activities were followed by confirmation sampling. If confirmation samples exceeded RRS1, over-excavation was performed to remediate any areas that exceeded RRS1. This cycle was repeated until the site achieved RRS1. During this period, approximately 580 CY of soil and waste material were excavated from the site. All excavation activities were conducted by Eagle Construction and Environmental Services of San Antonio, Texas, under the supervision of a Parsons Construction Manager.

Excavated waste at SWMU Bldg 43 was divided into two waste piles, depending on the area it was excavated from. Anticipating that the soil and waste material excavated from the burn area, located at the back of the building, would require metals stabilization treatment, it was separated from soil and waste material excavated from other portions of the site.

Three initial waste characterization samples were collected from the stockpiled soil, one from the burn area soil/waste pile (BLDG43-WC01) and two from the other site soil/waste pile (BLDG43-WC02 and BLDG43-WC03), and submitted for Toxicity Characteristic Leaching Procedure (TCLP) leachable metals analyses. TCLP analytical results indicated that BLDG43-WC02 and BLDG43-WC03 met Class 2 non-hazardous criteria, but BLDG43-WC01 exceeded Class 2 criteria for leachable lead. The excavated burn area soils were subsequently mixed *in situ* with agricultural grade phosphate as a metals stabilization technique. One additional sample (BLDG43-TWC04) was collected after stabilization to determine if the treated waste met Class 2 criteria. Results of analyses for the treated waste indicated the soil leachable lead results met Class 2 criteria. Waste characterization results are presented in **Table BLDG43-5**.

Treatment of waste/contaminated soil media, referred to as remediation waste, within SWMU Bldg 43 was conducted in accordance with the USEPA's Area of Contamination policy. The Area of Contamination concept is applicable for RCRA corrective actions and thus management of hazardous remediation waste, including treatment, and is allowed without triggering RCRA Subtitle C requirements. Additionally, remediation wastes are not generated until they are removed from the area of contamination. Therefore, only non-hazardous remediation wastes were generated from SWMU Bldg 43 and transported to Covell Gardens Landfill. Further discussion of the area of contamination concept and interpretation of the applicability for use at CSSA is provided in the revised **RFI Waste Management Plan**, dated February 2004.

Disposal of all SWMU Bldg 43 waste was accomplished under Waste Management, Inc. (WMI) waste profile CG-25591 C-18. The waste was disposed of at Covell Gardens Landfill facility in San Antonio, Texas. Copies of the SWMU Bldg 43 manifests are provided in **Appendix B**.

## 2.2 CONFIRMATION SAMPLING

Confirmation sampling was performed during July 2004, February 2005, and March 2005 (two sampling events). All July 2004 samples were analyzed for nine metals: barium, chromium, copper, nickel, zinc, arsenic, cadmium, lead, and mercury. The February 2005 and March 2005 sampling events were conducted after over excavation was completed at the locations that previously exceeded RRS1. Samples collected during these events were only analyzed for those metals that exceeded RRS1 during the previous sampling event.

Six samples, one bottom sample (denoted BOT) and five sidewall samples (denoted SW), were collected during July 2004. Copper exceeded RRS1 criteria in the bottom sample (BLDG43-BOT01) and a sidewall sample (BLDG43-SW05). Copper and mercury exceeded RRS1 criteria in BLDG43-SW03 (**Table BLDG43-6**). The remaining samples had no RRS1 exceedances.

Additional sampling was conducted during February 2005 to provide additional data across the site and in over-excavated areas that previously exceeded RRS1 during the July 2004 sampling event. Seven samples were collected; two bottom samples (BLDG43-BOT02 and BLDG43-BOT03) and five sidewall samples (BLDG43-SW06 through BLDG43-SW10). BLDG43-SW09 was collected where BLDG43-SW03 was over-excavated and BLDG43-SW10 was collected where BLDG43-SW05 was over-excavated. The remaining samples were collected to provide additional site data. All were analyzed for nine metals, except for BLDG43-BOT02, which was collected in the burn area and analyzed only for copper. Every sample collected had RRS1 exceedances for one or more metals (**Table BLDG43-6**).

After further excavation, additional sampling was conducted on March 3, 2005 to remediate those areas that exceeded RRS1 during the February 2005 sampling event. Seven samples were collected; two bottom samples (BLDG43-BOT04 and BLDG43-BOT05) and five sidewall samples (BLDG43-SW11 through BLDG43-SW15). BLDG43-BOT04 was collected where BLDG43-BOT02 was over-excavated, BLDG43-BOT05 was collected where BLDG43-BOT03 was over-excavated, BLDG43-SW11 was collected where BLDG43-SW09 was over-excavated, BLDG43-SW12 was collected where BLDG43-SW10 was over-excavated, BLDG43-SW13 was collected where BLDG43-SW06 was over-excavated, BLDG43-SW14 was collected where BLDG43-SW07 was over-excavated, and BLDG43-SW15 was collected where BLDG43-SW08 was over-excavated. All samples were analyzed only for those metals that previously exceeded RRS1 at that sampling location. All results were below RRS1, except for a 30.42 mg/kg copper result for BLDG43-SW15 (**Table BLDG43-6**), which slightly exceeds the CSSA background level of 23.2 mg/kg.

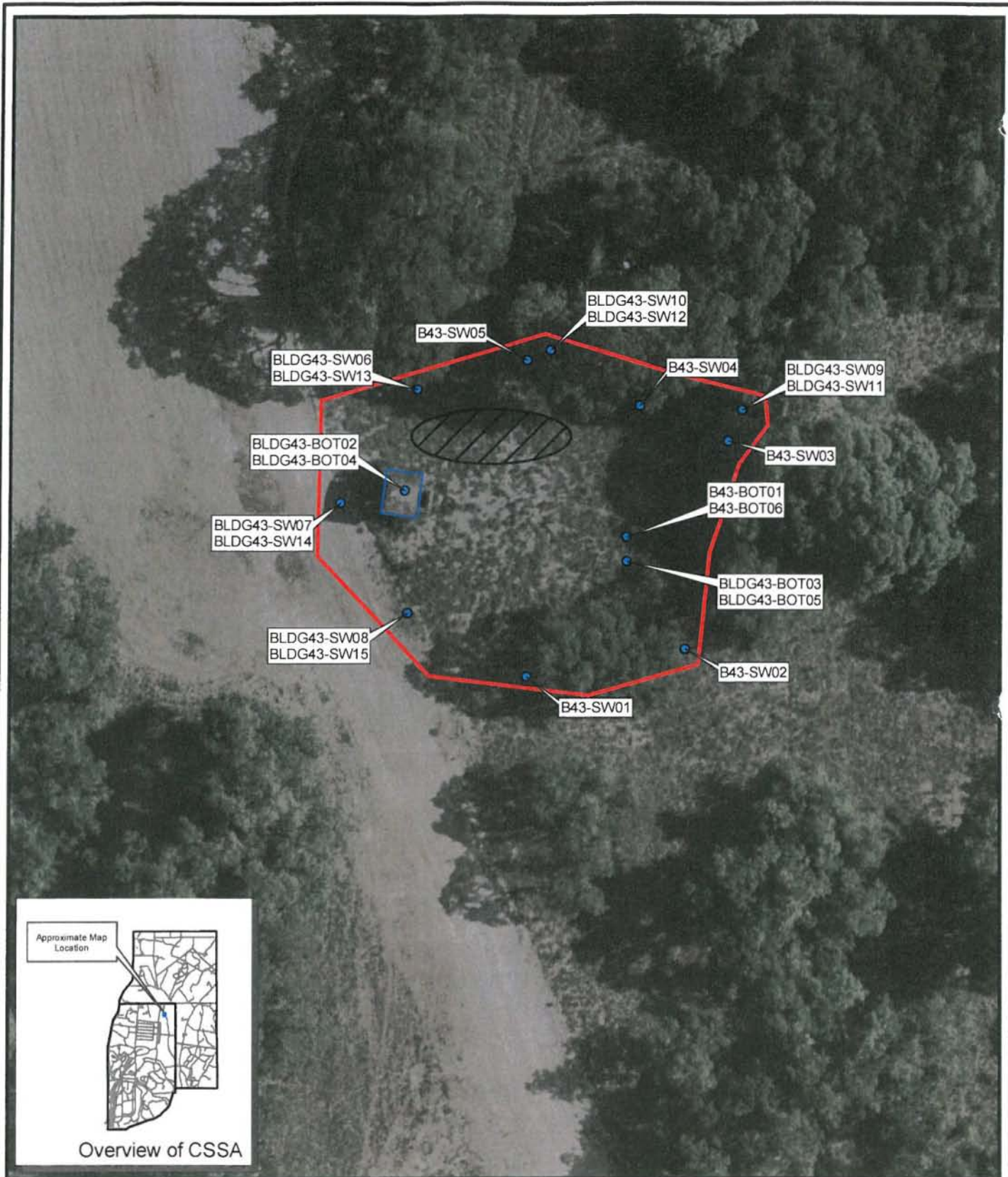
Realizing that a sample was erroneously omitted from the over-excavated BLDG43-BOT01 location on March 3, 2005, one additional sample (BLDG43-BOT06) was collected on March 22, 2005. The sample was only analyzed for copper, and the result was

below RRS1 (**Table BLDG43-6**). This last sample eliminated all but one RRS1 exceedance at the site.

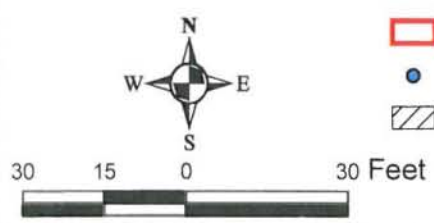
Since one copper exceedance remained at the site at sampling location BLDG43-SW15, statistical analysis was employed to determine if the site, as a whole, met RRS1 with respect to copper. If a portion of the site samples exceeds RRS1, 30 TAC §335.553(d)(2) allows the use of statistical comparison using the 95 percent confidence limits of the mean concentration of the contaminant as a representative value for the site. If all of the samples across the site are used to calculate an upper confidence limit (UCL), and the UCL is less than the established background level, the site can be closed under RRS1.

To calculate the UCL, the data must be normally or log-normally distributed. To test the distribution of the data, the Shapiro-Wilk test of normality is used (if sample sizes are less than or equal to 50). The Shapiro-Wilk test is included in the Environmental Protection Agency (EPA) software, ProUCL, used for the UCL calculations (EPA 2003; also located at <http://www.epa.gov/esd/tsc/install.htm>). If the distribution is normal, the UCLs are calculated on the raw data. If the distribution is not normal, then the data are log transformed, and the Shapiro-Wilk test of normality applied to the transformed data. If the data were log-normally distributed, the UCLs were calculated based on the transformed data. If the Shapiro-Wilk test statistic (W) exceeds the critical value of the statistic, then that distribution is considered normal or log-normal, according to the distribution of the data.

Copper was statistically analyzed using all of the samples collected during the closure sampling. The data were log-normally distributed. Based on the site copper results, ProUCL calculated the copper UCL at 21.51 mg/kg, below the RRS1 value of 23.2 mg/kg. The statistical evaluation is provided in **Appendix E**. An analytical results summary is provided in **Appendix A**, which contains all analytical results for the closure samples.



Aerial Photo Date: 2003



- Bldg-43 Boundary
- Closure Sample Locations
- Soil Treatment Stockpile Area

**Figure: BLDG43-9**

Closure Sample Location Map  
Camp Stanley Storage Activity

**PARSONS**



**Table BLDG43-5  
SWMU Building 43 Waste Characterization Results**

	Sample ID					BLDG43-WC01				BLDG43-WC02				BLDG43-WC03				BLDG43-TWC04			
	Sample Date					02/26/04				02/26/04				08/16/04				01/19/05			
	Sample Type					N1				N1				N1				N1			
Beginning Depth					NA				NA				NA				NA				
Ending Depth					NA				NA				NA				NA				
Lab ID					AP66347				AP66348				AP73685				AX11209				
Soil Comparison Criteria																					
Lab		Soil Comparison Criteria			Results				Results				Results				Results				
MDL	Lab RL	Hazardous	Class 1	Class 3	Flags	Dilution	SQL	Flags	Dilution	SQL	Flags	Dilution	SQL	Flags	Dilution	SQL	Flags	Dilution	SQL		
<b>TCLP Texas 11 Metals</b>																					
<b>SW1311/SW6010B (mg/L)</b>																					
Antimony	0.001	0.050	--	1	--			0.054	M	1	0.050	0.096	M	1	0.050	0.001	U	1	0.050		
Arsenic	0.002	0.030	5.0	1.8	0.05			0.002	U	1	0.030	0.002	J	1	0.030	0.002	U	1	0.030		
Barium	0.0003	0.005	100	100	1			1.958	M	1	0.005	6.356	M	5	0.025	0.6452	M	1	0.005		
Beryllium	0.0002	0.005	--	0.06	--			0.0017	J	1	0.005	0.0018	J	1	0.005	0.0002	U	1	0.005		
Cadmium	0.0003	0.007	1	0.5	0.005			0.1847		1	0.007	0.0597		1	0.007	0.0069	F	1	0.007		
Chromium	0.001	0.010	5.0	5	0.1			0.007	J	1	0.010	0.007	J	1	0.010	0.013		1	0.010		
Lead	0.0012	0.025	5.0	1.5	0.05			2.94		5	0.125	1.009		1	0.025	0.1194		1	0.025		
Nickel	0.001	0.01	--	70	--			0.049		1	0.010	0.001	U	1	0.010	0.0001	U	1	0.010		
Selenium	0.002	0.03	1	1	0.05			0.002	U	1	0.030	0.002	U	1	0.030	0.083		1	0.030		
Silver	0.0002	0.01	5.0	5	0.05			0.0007	J	1	0.010	0.0014	J	1	0.010	0.0147	M	1	0.010		
Mercury	0.00001	0.0002	0.2	0.2	0.002			0.00004	J	1	0.0002	0.00001	U	1	0.0002	0.08	F	1	0.0002		
<b>TPH (ug/kg)</b>																					
>C12-C28	17,000	57,000	--	1,500,000	--			151,098.9		1	57,000	72,678.3		1	57,000	17,000	U	1	57,000		
C6-C12	17,000	57,000	--	1,500,000	--			20,000	U	1	57,000	20,000	U	1	57,000	17,000	U	1	57,000		

Tables present all laboratory results for analytes detected above the method detection limit. All samples were analyzed by APPL Inc. Referenced laboratory package numbers: APPL Inc.: 43856, 45101, 46383.

**Abbreviations and Notes:**  
 Highlighted and boxed samples indicate results greater than Class 1 Standards.  
 DL Dilution  
 FD1 Field Duplicate  
 MDL Method Detection Limit  
 N1 Environmental Sample  
 NA Not Available  
 RL Reporting Limit  
 SQL Sample Quantitation Limit

**Data Qualifiers:**  
 B - The analyte was found in an associated blank, as well as in the sample.  
 F - The analyte was positively identified, but the associated numerical value is below the RL.  
 J - The analyte was positively identified, the quantitation is an estimation.  
 M - A matrix effect was present.  
 U - The analyte was analyzed for, but not detected. The associated numerical value is the MDL.

**Table BLDG43-5  
SWMU Building 43 Waste Characterization Results**

	Soil Comparison Criteria					BLDG43-WC01				BLDG43-WC02				BLDG43-WC03				BLDG43-TY/C04				
	Lab	MDL	Lab RL	Hazardous	Class 1	Class 3	Results	Flags	Dilution	SQL	Results	Flags	Dilution	SQL	Results	Flags	Dilution	SQL	Results	Flags	Dilution	SQL
	MDL	Lab RL	Hazardous	Class 1	Class 3	Results	Flags	Dilution	SQL	Results	Flags	Dilution	SQL	Results	Flags	Dilution	SQL	Results	Flags	Dilution	SQL	
<b>TCLP Texas 11 Metals</b>																						
<b>SW1311/SW6010B (mg/L)</b>																						
Antimony	0.001	0.050	--	1	--	0.054	M	1	0.050	0.096	M	1	0.050	0.001	U	1	0.050					
Arsenic	0.002	0.030	5.0	1.8	0.05	0.002	U	1	0.030	0.002	J	1	0.030	0.002	U	1	0.030					
Barium	0.0003	0.005	100	100	1	1.958	M	1	0.005	6.356	M	5	0.025	0.6452	M	1	0.005					
Beryllium	0.0002	0.005	--	0.08	--	0.0017	J	1	0.005	0.0018	J	1	0.005	0.0002	U	1	0.005					
Cadmium	0.0003	0.007	1	0.5	0.005	0.1847	J	1	0.007	0.0597	J	1	0.007	0.0069	F	1	0.007					
Chromium	0.001	0.010	5.0	5	0.1	0.007	J	1	0.010	0.007	J	1	0.010	0.013	J	1	0.010					
Lead	0.0012	0.025	5.0	1.5	0.05	2.94	J	5	0.125	1.009	J	1	0.025	0.1194	J	1	0.025	0.8771		20	0.100	
Nickel	0.001	0.01	--	70	--	0.049	J	1	0.010	0.001	U	1	0.010	0.0001	U	1	0.010					
Selenium	0.002	0.03	1	1	0.05	0.002	U	1	0.030	0.002	U	1	0.030	0.083	J	1	0.030					
Silver	0.0002	0.01	5.0	5	0.05	0.0007	J	1	0.010	0.0014	J	1	0.010	0.0147	M	1	0.010					
Mercury	0.00001	0.0002	0.2	0.2	0.002	0.00004	J	1	0.0002	0.00001	U	1	0.0002	0.08	F	1	0.0002					
<b>TPH (ug/kg)</b>																						
>C12-C28	17,000	57,000	--	1,500,000	--	151,098.9	J	1	57,000	72,678.3	J	1	57,000	17,000	U	1	57,000					
C6-C12	17,000	57,000	--	1,500,000	--	20,000	U	1	57,000	20,000	U	1	57,000	17,000	U	1	57,000					

Tables present all laboratory results for analytes detected above the method detection limit.

All samples were analyzed by APPL Inc.

Referenced laboratory package numbers: APPL Inc.: 43856, 45101, 45383.

**Abbreviations and Notes:**

Highlighted and boxed samples indicate results greater than Class 1 Standards.

- DL Dilution
- FD1 Field Duplicate
- MDL Method Detection Limit
- N1 Environmental Sample
- NA Not Available
- RL Reporting Limit
- SQL Sample Quantitation Limit

**Data Qualifiers:**

B- The analyte was found in an associated blank, as well as in the sample.

F- The analyte was positively identified, but the associated numerical value is below the RL.

J - The analyte was positively identified, the quantitation is an estimation.

M - A matrix effect was present.

U - The analyte was analyzed for, but not detected. The associated numerical value is the MDL.

Table LDG43-6  
SWMU Building 43 Closure Confirmation Sampling Results

	Sample ID			BLDG43-BOT01				BLDG43-BOT02				BLDG43-BOT03				BLDG43-BOT04			
	Sample Date			07/13/04				02/16/05				02/16/05				03/03/05			
	Sample Type			N1				N1				N1				N1			
	Lab ID			AP72383				AX13437				AX13438				AX14948			
	Soil Comparison Criteria			Results	Flags	Dilution	SQL	Results	Flags	Dilution	SQL	Results	Flags	Dilution	SQL	Results	Flags	Dilution	SQL
	Lab	MDL	Lab RL																
SW6010B (mg/kg)																			
Barium	0.08	1.0	186	35.26	M	1	0.08					35.42	J	1	0.08				
Chromium	0.1	20	49.2	7.0	M	1	0.1					7.1	F	1	0.1				
Copper	0.19	2.0	23.2	<b>See BLDG43-BOT06</b>				<b>See BLDG43-BOT04</b>				<b>See BLDG43-BOT05</b>				2.10		1	0.19
Nickel	0.12	2.0	35.5	2.45		1	0.12					3.88	J	1	0.12				
Zinc	0.63	5.0	73.2	49.46	M	1	0.63					<b>See BLDG43-BOT05</b>							
SW7131A (mg/kg)																			
Cadmium	0.01	0.1	3.0	0.12		1	0.01					0.71	M	5	0.05				
SW7471A (mg/kg)																			
Mercury	0.01	0.1	0.77	0.02	F	1	0.01					0.02	F	1	0.01				
SW7060A (mg/kg)																			
Arsenic	0.04	0.5	19.60	3.26		1	0.04					2.26		1	0.04				
SW7421 (mg/kg)																			
Lead	0.12	0.5	84.5	4.67	M	1	0.13					<b>See BLDG43-BOT05</b>							

Tables present all laboratory results for analytes detected above the method detection limit.  
 This table only includes final confirmation sampling results. Some sample locations were overexcavated to remove remnant contamination that exceeded RRS1. The table is designed to lead the reader to the final result for each sampling location. A complete summary of results, including those values that are omitted in this table, is presented in Appendix A.  
 All samples were analyzed by APPL Inc.  
 Referenced laboratory package numbers: 44673, 46616, 46747, 46906.  
 All MS/MSD results are presented in the Data Verification Report, Appendix C.

**Abbreviations and Notes:**

Highlighted and bolded sample concentrations exceed RRS1 (background) Standards.

- No risk reduction standard or background level available
- a Background values from Revised Background Report, 2002
- DL Dilution
- FD1 Field Duplicate
- MDL Method Detection Limit
- N1 Environmental Sample
- NA Not Available
- RL Reporting Limit
- SQL Sample Quantitation Limit

**Data Qualifiers:**

- B- The analyte was found in an associated blank, as well as in the sample.
- F- The analyte was positively identified, but the associated numerical value is below the RL.
- J - The analyte was positively identified, the quantitation is an estimation.
- M - A matrix effect was present.
- R- The data are unusable due to deficiencies in the ability to analyze the sample and meet OC criteria

**Table BLDG43-6**  
**SWMU Building 43 Closure Confirmation Sampling Results**

	Sample ID			BLDG43-BOT05				BLDG43-BOT06				BLDG43-SW01				BLDG43-SW02				BLDG43-SW03			
	Sample Date			03/03/05				03/22/05				07/13/04				07/13/04				07/13/04			
	Sample Type			N1				N1				N1				N1				N1			
	Lab ID			AX14949				AX16202				AP72384				AP72385				AP72386			
	Soil Comparison Criteria			Results	Flags	Dilution	SQL	Results	Flags	Dilution	SQL	Results	Flags	Dilution	SQL	Results	Flags	Dilution	SQL	Results	Flags	Dilution	SQL
	Lab MDL	Lab RL	Background <sup>a</sup> Soils																				
<b>SW6010B (mg/kg)</b>																							
Barium	0.08	1.0	180									48.53	M	1	0.08	24.42	M	1	0.08	68.21	M	1	0.08
Chromium	0.1	20	49.2									12.10	M	1	0.1	6.90	M	1	0.1	16.4	M	1	0.1
Copper	0.19	2.0	23.2	2.72		1	0.19	3.13		1	0.19	5.70	M	1	0.19	8.36	M	1	0.19	<b>See BLDG43-SW09</b>			
Nickel	0.12	2.0	35.5									6.10		1	0.12	2.66		1	0.12	9.77		1	0.12
Zinc	0.63	5.0	73.2	3.06	F	1	0.63					11.55	M	1	0.63	13.17	M	1	0.63	47.33	M	1	0.63
<b>SW7131A (mg/kg)</b>																							
Cadmium	0.01	0.1	3.0									0.18	M	1	0.01	0.13	M	1	0.01	0.48	M	2	0.02
<b>SW7471A (mg/kg)</b>																							
Mercury	0.01	0.1	0.77									0.03	F	1	0.01	0.03	F	1	0.01	<b>See BLDG43-SW09</b>			
<b>SW7060A (mg/kg)</b>																							
Arsenic	0.04	0.5	19.60									3.18		1	0.04	1.65		1	0.04	5.90		2	0.08
<b>SW7421 (mg/kg)</b>																							
Lead	0.13	0.5	84.5	3.07		1	0.13					5.97	M	2	0.26	3.29	M	1	0.13	25.75	M	10	1.3

Tables present all laboratory results for analytes detected above the method detection limit.  
 This table only includes final confirmation sampling results. Some sample locations were overexcavated to remove remnant contamination that exceeded RRS1. The table is designed to lead the reader to the final result for each sampling location. A complete summary of results, including those values that are omitted in this table, is presented in Appendix A.  
 All samples were analyzed by APPL Inc.  
 Referenced laboratory package numbers: 44873, 46616, 46747, 46906.  
 All MS/MSD results are presented in the Data Verification Report, Appendix C.

**Abbreviations and Notes:**

Highlighted and bolded sample concentrations exceed RRS1 (background) Standards.

- No risk reduction standard or background level available
- a Background values from Revised Background Report, 2002
- DL Dilution
- FD1 Field Duplicate
- MDL Method Detection Limit
- N1 Environmental Sample
- NA Not Available
- RL Reporting Limit
- SQL Sample Quantitation Limit

**Data Qualifiers:**

- B- The analyte was found in an associated blank, as well as in the sample.
- F- The analyte was positively identified, but the associated numerical value is below the RL.
- J - The analyte was positively identified, the quantitation is an estimation.
- M - A matrix effect was present.
- R- The data are unusable due to deficiencies in the ability to analyze the sample and meet QC criteria

Table LDG43-6  
SWMU Building 43 Closure Confirmation Sampling Results

Sample ID	Sample Date	Sample Type	Lab ID	Soil Comparison Criteria		Lab Background	MDL	Lab RL	Soils	Results																	
				Background						Lab RL		Soils		Results		Flags		Dilution		Results		Flags		Dilution			
BLDG43-SW04	07/13/04	N1	AP72387							64.97	M	1	0.08	35.67	M	1	0.08	60.28	J	1	0.08	169.16	J	1	0.08	See BLDG43-SW14	
BLDG43-SW05	07/13/04	N1	AP72388							16.3	M	1	0.1	8.6	M	1	0.1	13.8	F	1	0.1	10.55	J	1	0.12	See BLDG43-SW14	
BLDG43-SW06	02/16/05	N1	AX13439							9.46	M	1	0.12	4.03	J	1	0.12	7.81	J	1	0.12	10.55	J	1	0.12	See BLDG43-SW14	
BLDG43-SW07	02/16/05	N1	AX13440							35.08	M	1	0.63	33.76	M	1	0.63	39.95	J	5	3.15	10.55	J	1	0.12	See BLDG43-SW14	
SW6010B (mg/kg)	0.08	1.0	186	0.08	1.0	186	64.97	M	1	0.08	35.67	M	1	0.08	60.28	J	1	0.08	169.16	J	1	0.08	169.16	J	1	0.08	See BLDG43-SW14
Barium	0.08	1.0	186	0.08	1.0	186	64.97	M	1	0.08	35.67	M	1	0.08	60.28	J	1	0.08	169.16	J	1	0.08	169.16	J	1	0.08	See BLDG43-SW14
Chromium	0.1	20	49.2	0.1	20	49.2	16.3	M	1	0.1	8.6	M	1	0.1	13.8	F	1	0.1	16.7	F	1	0.1	16.7	F	1	0.1	See BLDG43-SW14
Copper	0.19	2.0	23.2	0.19	2.0	23.2	20.60	M	1	0.19	1.0	0.19	1.0	0.19	1.0	0.19	1.0	10.55	J	1	0.12	10.55	J	1	0.12	See BLDG43-SW14	
Nickel	0.12	2.0	35.5	0.12	2.0	35.5	9.46	M	1	0.12	4.03	J	1	0.12	7.81	J	1	0.12	10.55	J	1	0.12	10.55	J	1	0.12	See BLDG43-SW14
Zinc	0.63	5.0	73.2	0.63	5.0	73.2	35.08	M	1	0.63	33.76	M	1	0.63	39.95	J	5	3.15	10.55	J	1	0.12	10.55	J	1	0.12	See BLDG43-SW14
SW7131A (mg/kg)	0.01	0.1	3.0	0.01	0.1	3.0	0.44	M	2	0.02	0.52	M	2	0.02	0.38	M	2	0.02	0.38	M	2	0.02	0.38	M	2	0.02	See BLDG43-SW14
Cadmium	0.01	0.1	3.0	0.01	0.1	3.0	0.44	M	2	0.02	0.52	M	2	0.02	0.38	M	2	0.02	0.38	M	2	0.02	0.38	M	2	0.02	See BLDG43-SW14
SW7471A (mg/kg)	0.01	0.1	0.77	0.01	0.1	0.77	0.28	M	1	0.01	0.22	M	1	0.01	0.01	U	1	0.01	0.12	U	1	0.01	0.12	U	1	0.01	See BLDG43-SW14
Mercury	0.01	0.1	0.77	0.01	0.1	0.77	0.28	M	1	0.01	0.22	M	1	0.01	0.01	U	1	0.01	0.12	U	1	0.01	0.12	U	1	0.01	See BLDG43-SW14
SW7060A (mg/kg)	0.04	0.5	19.60	0.04	0.5	19.60	6.58	M	2	0.08	6.59	M	2	0.08	3.17	M	1	0.04	4.15	M	1	0.04	4.15	M	1	0.04	See BLDG43-SW14
Arsenic	0.04	0.5	19.60	0.04	0.5	19.60	6.58	M	2	0.08	6.59	M	2	0.08	3.17	M	1	0.04	4.15	M	1	0.04	4.15	M	1	0.04	See BLDG43-SW14
SW7421 (mg/kg)	0.13	0.5	84.5	0.13	0.5	84.5	19.20	M	5	0.65	37.02	M	10	1.3	20.25	M	5	0.65	4.15	M	5	0.65	4.15	M	5	0.65	See BLDG43-SW14
Lead	0.13	0.5	84.5	0.13	0.5	84.5	19.20	M	5	0.65	37.02	M	10	1.3	20.25	M	5	0.65	4.15	M	5	0.65	4.15	M	5	0.65	See BLDG43-SW14

Tables present all laboratory results for analytes detected above the method detection limit.

This table only includes final confirmation sampling results. Some sample locations were overexcavated to remove remnant contamination that exceeded RRS1. The table is designed to lead the reader to the final result for each sampling location. A complete summary of results, including those values that are omitted in this table, is presented in Appendix A.

All samples were analyzed by APPL Inc. Referenced laboratory package numbers: 44873, 46616, 46747, 46906. All MS/MSD results are presented in the Data Verification Report, Appendix C.

Abbreviations and Notes:  
Highlighted and bolded sample concentrations exceed RRS1 (background) Standards.

-- No risk reduction standard or background level available  
a Background values from Revised Background Report, 2002

DL Dilution  
FD1 Field Duplicate  
MDL Method Detection Limit  
N1 Environmental Sample  
NA Not Available  
RL Reporting Limit  
SQL Sample Quantitation Limit

Data Qualifiers:  
B-The analyte was found in an associated blank, as well as in the sample.  
F-The analyte was positively identified, but the associated numerical value is below the RL.  
J-The analyte was positively identified, the quantation is an estimation.

M-A matrix effect was present.  
R-The data are unusable due to deficiencies in the ability to analyze the sample and meet OTC criteria.

**Table BLDG43-6  
SWMU Building 43 Closure Confirmation Sampling Results**

	Sample ID			BLDG43-SW08				BLDG43-SW09				BLDG43-SW10				BLDG43-SW11			
	Sample Date			02/16/05				02/16/05				02/16/05				03/03/05			
	Sample Type			N1				N1				N1				N1			
	Lab ID			AX13441				AX13442				AX13443				AX14950			
	Soil Comparison Criteria			Results	Flags	Dilution	SQL	Results	Flags	Dilution	SQL	Results	Flags	Dilution	SQL	Results	Flags	Dilution	SQL
	Lab	Background <sup>a</sup>																	
	MDL	Lab RL	Soils																
<b>SW6010B (mg/kg)</b>																			
Barium	0.08	1.0	185	55.02	J	1	0.08												
Chromium	0.1	20	49.2	13.0	F	1	0.1												
Copper	0.19	2.0	23.2	See BLDG43-SW15				See BLDG43-SW11				See BLDG43-SW12				9.34		1	0.19
Nickel	0.12	2.0	35.5	8.43	J	1	0.12												
Zinc	0.63	5.0	73.2	See BLDG43-SW15															
<b>SW7131A (mg/kg)</b>																			
Cadmium	0.01	0.1	3.0	0.40	M	2	0.02												
<b>SW7471A (mg/kg)</b>																			
Mercury	0.01	0.1	0.77	0.08	F	1	0.01	0.27		1	0.01								
<b>SW7060A (mg/kg)</b>																			
Arsenic	0.04	0.5	19.60	3.79		1	0.04												
<b>SW7421 (mg/kg)</b>																			
Lead	0.13	0.5	84.5	36.66		10	1.3												

Tables present all laboratory results for analytes detected above the method detection limit.  
 This table only includes final confirmation sampling results. Some sample locations were overexcavated to remove remnant contamination that exceeded RRS1. The table is designed to lead the reader to the final result for each sampling location. A complete summary of results, including those values that are omitted in this table, is presented in Appendix A.  
 All samples were analyzed by APPL Inc.  
 Referenced laboratory package numbers: 44873, 46616, 46747, 46906.  
 All MS/MSD results are presented in the Data Verification Report, Appendix C.

**Abbreviations and Notes:**

Highlighted and bolded sample concentrations exceed RRS1 (background) Standards.

- No risk reduction standard or background level available
- a Background values from Revised Background Report, 2002
- DL Dilution
- FD1 Field Duplicate
- MDL Method Detection Limit
- N1 Environmental Sample
- NA Not Available
- RL Reporting Limit
- SQL Sample Quantitation Limit

**Data Qualifiers:**

- B- The analyte was found in an associated blank, as well as in the sample.
- F- The analyte was positively identified, but the associated numerical value is below the RL.
- J - The analyte was positively identified, the quantitation is an estimation.
- M - A matrix effect was present.
- R- The data are unusable due to deficiencies in the ability to analyze the sample and meet OC criteria

Table BLDG43-6  
SWMU Building 43 Closure Confirmation Sampling Results

	Sample ID			BLDG43-SW12				BLDG43-SW13				BLDG43-SW14				BLDG43-SW15				
	Sample Date			03/03/05				03/03/05				03/03/05				03/03/05				
	Sample Type			N1				N1				N1				N1				
	Lab ID			AX14951				AX14952				AX14953				AX14954				
	Soil Comparison Criteria			Results	Flags	Dilution	SQL	Results	Flags	Dilution	SQL	Results	Flags	Dilution	SQL	Results	Flags	Dilution	SQL	
	Lab	MDL	Lab RL																	Background <sup>a</sup>
SW6010B (mg/kg)																				
Barium	0.08	1.0	186																	
Chromium	0.1	20	49.2																	
Copper	0.19	2.0	23.2	5.86		1	0.19	6.43		1	0.19	15.79		1	0.19	<b>30.42</b>		1	0.19	
Nickel	0.12	2.0	35.5																	
Zinc	0.63	5.0	73.2									15.25		1	0.63	18.36		1	0.63	
SW7131A (mg/kg)																				
Cadmium	0.01	0.1	3.0									0.33		2	0.02					
SW7471A (mg/kg)																				
Mercury	0.01	0.1	0.77																	
SW7060A (mg/kg)																				
Arsenic	0.04	0.5	19.80																	
SW7421 (mg/kg)																				
Lead	0.13	0.5	84.5									14.69		5	0.65					

Tables present all laboratory results for analytes detected above the method detection limit.  
 This table only includes final confirmation sampling results. Some sample locations were over-excavated to remove remnant contamination that exceeded RRS1. The table is designed to lead the reader to the final result for each sampling location. A complete summary of results, including those values that are omitted in this table, is presented in Appendix A.  
 All samples were analyzed by APPL Inc.  
 Referenced laboratory package numbers: 44873, 46516, 46747, 46906.  
 All MS/MSD results are presented in the Data Verification Report, Appendix C.

**Abbreviations and Notes:**  
 Highlighted and bolded sample concentrations exceed RRS1 (background) Standards.  
 -- No risk reduction standard or background level available  
 a Background values from Revised Background Report, 2002  
 DL Dilution  
 FD1 Field Duplicate  
 MDL Method Detection Limit  
 N1 Environmental Sample  
 NA Not Available  
 RL Reporting Limit  
 SQL Sample Quantitation Limit

**Data Qualifiers:**  
 B- The analyte was found in an associated blank, as well as in the sample.  
 F- The analyte was positively identified, but the associated numerical value is below the RL.  
 J- The analyte was positively identified, the quantitation is an estimation.  
 M- A matrix effect was present.  
 R- The data are unusable due to deficiencies in the ability to analyze the sample and meet QC criteria.

**THIS PAGE INTENTIONALLY LEFT BLANK**



## SECTION 3 CONCLUSIONS AND CLOSURE CERTIFICATION

### 3.1 CONCLUSIONS AND RECOMMENDATIONS

RFI investigation results for SWMU Bldg 43 soils indicated elevated metals concentrations. Excavation and disposal activities were conducted where 580 CY of waste and waste residue were removed from the site. Confirmation sampling was conducted after the excavation/disposal activities to ensure that all waste material was removed from the site. Excavation and waste treatment/disposal activities were performed from July 2004 to March 2005.

Following excavation and over-excavation activities, all but one copper result met RRS1 criteria. Statistical analysis was employed to determine whether the site, as a whole, met RRS1 with respect to copper. EPA's ProUCL software was used to calculate a UCL for copper at the site, which was below RRS1 criteria.

Since waste and waste residue has been removed and disposed at SWMU Bldg 43, and confirmation sampling shows that the site meets RRS1 criteria, RRS1 closure is recommended.

### 3.2 EVALUATION OF DATA QUALITY OBJECTIVES ATTAINMENT

Overall, DQOs for the investigations at CSSA are provided in Volume 1-1 behind the RFI Addendum tab (**Section 11 of the Work Plan Overview**). A detailed list of DQOs for SWMU Bldg 43, along with an evaluation of whether each DQO has been attained, is provided in **Appendix C**. As described in Section 1, the main objectives of the SWMU Bldg 43 investigation are to determine if the site meets TCEQ requirements for RRS1 closure and to meet requirements of the §3008(h) Administrative Consent Order.

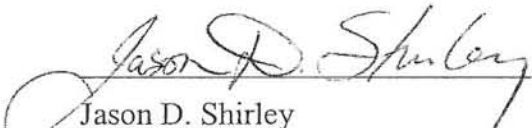
All data generated during the SWMU Bldg 43 investigation were reviewed to confirm conformance with the AFCEE QAPP; the data verification reports are included in **Appendix D**. All data are considered useable for site characterization purposes. Although several results are flagged with a "J", "F", or "M", these results are considered usable because estimation of the quantitation does not significantly affect the sample results.

3.3 CLOSURE CERTIFICATION

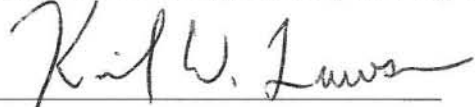
PARTIAL FACILITY CLOSURE CERTIFICATION  
SOLID WASTE MANAGEMENT UNIT BLDG 43

Department of the Army  
Camp Stanley Storage Activity  
Boerne, Texas


I certify that the above-described closure was performed under my direction, in accordance with the work plan and 30 TAC §335 Subpart S, and as described in this report, and that, to the best of my knowledge and belief, said closure has been successfully accomplished.

  
Jason D. Shirley  
Installation Manager, Camp Stanley Storage Activity

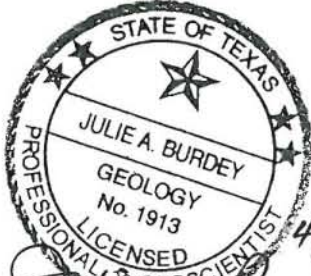

25 APR 05  
Date

  
Kirk W. Lawson, P.E.  
State of Texas #79204  
Parsons

4/28/2005  
Date

  
Julie Burdey, P.G.  
State of Texas #1913  
Parsons

April 25, 2005  
Date

  
4/25/05  


  
4/25/05  


**APPENDIX A**  
**ANALYTICAL RESULTS SUMMARY**

**THIS PAGE INTENTIONALLY LEFT BLANK**

Appendix A  
Analytical Results Summary

	Sample ID		BLDG43-BOT01				BLDG43-BOT02				BLDG43-BOT03				BLDG43-BOT04			
	Sample Date		07/13/04				02/16/05				02/16/05				03/03/05			
	Sample Type		N1				N1				N1				N1			
	Lab ID		AP72383				AX13437				AX13438				AX14948			
	Lab MDL	Lab RL	Results	Flags	Dilution	SQL	Results	Flags	Dilution	SQL	Results	Flags	Dilution	SQL	Results	Flags	Dilution	SQL
SW6010B (mg/kg)																		
Barium	0.08	1.0	35.26	M	1	0.08					35.42	J	1	0.08				
Chromium	0.1	20	7.0	M	1	0.1					7.1	F	1	0.1				
Copper	0.19	2.0	89.88	M	1	0.19	623.89	J	5	0.95	557.70		5	0.95	2.10		1	0.19
Nickel	0.12	2.0	2.45		1	0.12					3.88	J	1	0.12				
Zinc	0.63	5.0	49.46	M	1	0.63					1242.05		10	6.3				
SW7131A (mg/kg)																		
Cadmium	0.01	0.1	0.12		1	0.01					0.71	M	5	0.05				
SW7471A (mg/kg)																		
Mercury	0.01	0.1	0.02	F	1	0.01					0.02	F	1	0.01				
SW7060A (mg/kg)																		
Arsenic	0.04	0.5	3.26		1	0.04					2.26		1	0.04				
SW7421 (mg/kg)																		
Lead	0.13	0.5	4.67	M	1	0.13					156.86		40	5.2				

Appendix A  
Analytical Results Summary

	Sample ID		BLDG43-BOT05				BLDG43-BOT06				BLDG43-SW01				BLDG43-SW02			
	Sample Date		03/03/05				03/22/05				07/13/04				07/13/04			
	Sample Type		N1				N1				N1				N1			
	Lab ID		AX14949				AX16202				AP72384				AP72385			
	Lab MDL	Lab RL	Results	Flags	Dilution	SQL	Results	Flags	Dilution	SQL	Results	Flags	Dilution	SQL	Results	Flags	Dilution	SQL
SW6010B (mg/kg)																		
Barium	0.08	1.0									48.53	M	1	0.08	24.42	M	1	0.08
Chromium	0.1	20									12.10	M	1	0.1	6.90	M	1	0.1
Copper	0.19	2.0	2.72		1	0.19	3.13		1	0.19	5.70	M	1	0.19	8.36	M	1	0.19
Nickel	0.12	2.0									6.10		1	0.12	2.66		1	0.12
Zinc	0.63	5.0	3.06	F	1	0.63					11.55	M	1	0.63	13.17	M	1	0.63
SW7131A (mg/kg)																		
Cadmium	0.01	0.1									0.18	M	1	0.01	0.13	M	1	0.01
SW7471A (mg/kg)																		
Mercury	0.01	0.1									0.03	F	1	0.01	0.03	F	1	0.01
SW7060A (mg/kg)																		
Arsenic	0.04	0.5									3.18		1	0.04	1.65		1	0.04
SW7421 (mg/kg)																		
Lead	0.13	0.5	3.07		1	0.13					5.97	M	2	0.26	3.29	M	1	0.13

**Appendix A  
Analytical Results Summary**

	Sample ID		BLDG43-SW03				BLDG43-SW04				BLDG43-SW05				BLDG43-SW06				
	Sample Date		07/13/04				07/13/04				07/13/04				02/16/05				
	Sample Type		N1				N1				N1				N1				
	Lab ID		AP72386				AP72387				AP72388				AX13439				
	Lab MDL	Lab RL	Results	Flags	Dilution	SQL	Results	Flags	Dilution	SQL	Results	Flags	Dilution	SQL	Results	Flags	Dilution	SQL	
SW6010B (mg/kg)																			
Barium	0.08	1.0	68.21	M	1	0.08	64.97	M	1	0.08	35.67	M	1	0.08	60.28	J	1	0.08	
Chromium	0.1	20	16.4	M	1	0.1	16.3	M	1	0.1	8.6	M	1	0.1	13.8	F	1	0.1	
Copper	0.19	2.0	48.44	M	1	0.19	20.60	M	1	0.19	28.92	M	1	0.19	25.13		1	0.19	
Nickel	0.12	2.0	9.77		1	0.12	9.46		1	0.12	4.03		1	0.12	7.81	J	1	0.12	
Zinc	0.63	5.0	47.33	M	1	0.63	35.08	M	1	0.63	33.76	M	1	0.63	39.95		5	3.15	
SW7131A (mg/kg)																			
Cadmium	0.01	0.1	0.48	M	2	0.02	0.44	M	2	0.02	0.52	M	2	0.02	0.38	M	2	0.02	
SW7471A (mg/kg)																			
Mercury	0.01	0.1	0.96		1	0.01	0.28		1	0.01	0.22		1	0.01	0.01	U	1	0.01	
SW7060A (mg/kg)																			
Arsenic	0.04	0.5	5.90		2	0.08	6.58		2	0.08	6.59		2	0.08	3.17		1	0.04	
SW7421 (mg/kg)																			
Lead	0.13	0.5	25.75	M	10	1.3	19.20	M	5	0.65	37.02	M	10	1.3	20.25		5	0.65	

**Appendix A  
Analytical Results Summary**

	Sample ID		BLDG43-SW07				BLDG43-SW08				BLDG43-SW09				BLDG43-SW10			
	Sample Date		02/16/05				02/16/05				02/16/05				02/16/05			
	Sample Type		N1				N1				N1				N1			
	Lab ID		AX13440				AX13441				AX13442				AX13443			
	Lab MDL	Lab RL	Results	Flags	Dilution	SQL	Results	Flags	Dilution	SQL	Results	Flags	Dilution	SQL	Results	Flags	Dilution	SQL
SW6010B (mg/kg)																		
Barium	0.08	1.0	169.16	J	1	0.08	55.02	J	1	0.08								
Chromium	0.1	20	16.7	F	1	0.1	13.0	F	1	0.1								
Copper	0.19	2.0	1693.85		10	1.9	180.22		1	0.19	23.63		1	0.19	44.89		1	0.19
Nickel	0.12	2.0	10.55	J	1	0.12	8.43	J	1	0.12								
Zinc	0.63	5.0	1173.18		10	6.3	158.84	J	5	3.15								
SW7131A (mg/kg)																		
Cadmium	0.01	0.1	4.33	M	20	0.2	0.40	M	2	0.02								
SW7471A (mg/kg)																		
Mercury	0.01	0.1	0.12		1	0.01	0.08	F	1	0.01	0.27		1	0.01				
SW7060A (mg/kg)																		
Arsenic	0.04	0.5	4.15		2	0.08	3.79		1	0.04								
SW7421 (mg/kg)																		
Lead	0.13	0.5	492.10		100	13	36.66		10	1.3								



**Appendix A  
Analytical Results Summary**

	Sample ID		BLDG43-SW11				BLDG43-SW12				BLDG43-SW13				BLDG43-SW14				BLDG43-SW15				
	Sample Date		03/03/05				03/03/05				03/03/05				03/03/05				03/03/05				
	Sample Type		N1				N1				N1				N1				N1				
	Lab ID		AX14950				AX14951				AX14952				AX14953				AX14954				
	Lab MDL	Lab RL	Results	Flags	Dilution	SQL	Results	Flags	Dilution	SQL	Results	Flags	Dilution	SQL	Results	Flags	Dilution	SQL	Results	Flags	Dilution	SQL	
SW6010B (mg/kg)																							
Barium	0.08	1.0																					
Chromium	0.1	20																					
Copper	0.19	2.0	9.34		1	0.19	5.86		1	0.19	6.43		1	0.19	15.79		1	0.19	30.42		1	0.19	
Nickel	0.12	2.0																					
Zinc	0.63	5.0													15.25		1	0.63	18.36		1	0.63	
SW7131A (mg/kg)																							
Cadmium	0.01	0.1													0.33		2	0.02					
SW7471A (mg/kg)																							
Mercury	0.01	0.1																					
SW7060A (mg/kg)																							
Arsenic	0.04	0.5																					
SW7421 (mg/kg)																							
Lead	0.13	0.5													14.69		5	0.65					

**THIS PAGE INTENTIONALLY LEFT BLANK**

**APPENDIX B  
WASTE MANIFESTS**

**THIS PAGE INTENTIONALLY LEFT BLANK**