PARSONS

Technical Memorandum

To: Gabe Moreno, CSSA

From: Parsons

CC: Environmental Encyclopedia, DMS

Date: September 12, 2011

Re: Interim Removal Action for Metals-Impacted Sand Bedding Material at Area of Concern 65, Camp Stanley Storage Activity, TX

Introduction

This technical memorandum (tech memo) documents environmental Interim Removal Action (IRA) activities at Area of Concern 65 (AOC-65) to remove metals-impacted sand bedding material along sanitary sewer lines on the west side of Building 90. This work was performed under Contract W912G-10-D-0026, Delivery Order (DO) DO 007 with the U.S. Army Corps of Engineers (USACE), Fort Worth District (CESWF). This work has been performed in accordance with requirements of the Resource Conservation and Recovery Act (RCRA) 3008(h) Order in effect for Camp Stanley Storage Activity (CSSA) and in accordance with 30 Texas Administrative Code (TAC) §350, the Texas Risk Reduction Program (TRRP) of the Texas Commission on Environmental Quality (TCEQ).

Work included environmental sampling; excavation and removal of impacted soil; waste characterization and confirmatory sampling and analysis; and proper documentation of all activities, including preparation of this tech memo. All work was performed according to applicable federal, state, and local rules and regulations.

Background

AOC-65 is located in an industrial area of the Inner Cantonment of CSSA (**Figure 1**). The source of contamination at AOC-65 includes activities associated with weapons maintenance and testing operations at Building 90 (**Figure 2**). AOC-65 was identified as an area of concern due to solvent contamination in the area. However, the area also has lead contamination due to use of lead-contaminated sand as bedding material for wastewater lines along Building 89 and 90, and possibly also due to lead-contaminated dust emissions from the former indoor firing range in Building 90, as described in further detail below.

Lead (dust and fine particles of sand containing lead) has possibly also been distributed in the area due to past test firing practices at Building 90. The test fire room is used for weapon maintenance quality checks. Until 2004, guns, pistols, machine guns, etc., were fired into a sand bank in the test fire room. The ventilation system, which was a roof vent, may have allowed lead-contaminated dust and sand to escape from the room to the surrounding area. In 2003, the sand was removed from the test fire room and properly disposed. The sand bank was replaced with a projectile trap system consisting of steel plates. A high-efficiency particulate air (HEPA) filtration system designed for 99.99% removal efficiency was also installed. The projectiles and air pollution control dust are now collected and recycled.

The sand bedding in the area southwest of AOC-68 was sampled in September 2009 and contained elevated levels of lead and cadmium. This area was considered to be a part of the investigation of AOC-65 and the Building 90 test fire room operations. During sanitary sewer line repair efforts near Building 89 in October 2009, sand bedding material was visually determined to contain lead projectiles. No samples of the Building 89 sand bedding were collected prior to this IRA.

Setting

The sand bedding for the sanitary sewer line from Building 89 (Figure 2) and the former compressed air line was located within the boundary of AOC-65, in an unpaved area between Building 90 and AOC-67/68. Some of the sand that was previously used in the Building 90 test fire room operations, as discussed above, was reportedlyhistorically used (unknown date) as sand bedding for underground piping in some areas.

Soil Investigations, Excavation, Removal, and Confirmation Sampling at AOC-65

Following the CSSA-specific plans, analyses were performed using U.S. Environmental Protection Agency (USEPA) *Test Methods for Evaluating Solid Waste* (SW-846): Method 6020 (arsenic, barium, cadmium, chromium, copper, lead, nickel, and zinc); and Method 7471A (mercury). Prior to soil/waste management, waste characterization samples were collected from the excavated material and analyzed for toxicity characteristic leaching procedure (TCLP) metals (Methods SW1311/6010B and SW1311/7470A) and total petroleum hydrocarbons (TPH) (Method TX1005). All samples were sent to Agriculture & Priority Pollutants Laboratory, Inc. (APPL) for analysis.

The soil action levels were determined using the Texas Risk Reduction Program (TRRP) tiered protective concentration limits (PCL). The TRRP PCL comparison procedure is to first evaluate each contaminant of concern (COC) against its appropriate standardized Tier 1 value. The appropriate Tier 1 value is selected based on the land use and the general size of the site, which is also referred to as the "source area" size. AOC-65 is not used for human habitation, nor are there any plans to ever use it as residential property in the future. Based on the land use classification guidelines provided by TCEQ (TCEQ TRRP-07, October 2008), AOC-65 has a commercial/industrial land use. If the source area is between 0.5 acre and 30 acres, as is the case for AOC-65, the PCLs are based on a 30-acre source area. The PCL is then selected based on the most conservative, or lowest value, of the exposure pathways present at the site. At CSSA, only two exposure pathways are complete: (1) the total soil combined pathway ($^{Tot}Soil_{Comb}$) (i.e., exposure to a COC from incidental ingestion, dermal contact, inhalation of volatiles and particulates, and vegetable consumption); or (2) the soil to groundwater pathway ($^{GW}Soil_{Ing}$) (i.e., soil-to-groundwater leaching of a COC to groundwater, where the PCL is the highest concentration of COC allowed in soil to be protective of Class 1 or Class 2 groundwater). Also based on the TCEQ guidance, if the background level or the method quantification limit (MQL) for a COC is a higher concentration than the PCL, then the higher of the background or MQL is used as the action level.

The most current (May 2011) commercial/industrial land use Tier 1 soil PCLs were initially selected as the cleanup levels for AOC-65. However, in accordance with TCEQ TRRP-22 (November 2010), a calculated site-specific Tier 2 COC value was calculated for one COC, lead, because detected concentrations exceeded the Tier 1 criteria. Lead did not meet the Tier 1 $^{GW}Soil_{Ing}$ PCL of 84.5 mg/kg (note that the CSSA-specific background concentration for lead replaces the established Tier 1 $^{GW}Soil_{Ing}$ PCL of 1.51 mg/kg). Therefore, a Tier 2 $^{GW}Soil_{Ing}$ commercial/industrial PCL of 6,929 mg/kg was calculated as shown in **Appendix D**. As shown in Appendix D, the site-specific criteria used to calculate the Tier 2 commercial/industrial PCL for lead at AOC-65 were derived from nearby SWMU B-34 (approximately 2,275 feet north of

AOC-65), which is comparable to AOC-65 in physical/geological setting and land use classification.

All soil sampling and excavation activities performed at AOC-65 are summarized in **Table 1**. A summary of the cleanup confirmation results at the sites are shown in **Table 2** and the confirmation soil sampling locations are shown on **Figure 3**. As shown on Figure 3, excavation at the sites occurred within the boundaries of AOC-65. Photographs of site activities are shown in **Appendix A**.

Initial Soil Sampling

Initial soil sampling using a field portable x-ray fluorescence (XRF) analyzer was performed in the IRA area within AOC-65 in June 2010. This sampling included approximately 50 surface soil locations. Samples were recorded for lead concentrations, and the results are shown on Figure 3.

1st Excavation and Removal

The excavation at AOC-65 was initiated on December 12, 2010. The areas near the test fire room where lead exceeded the PCL were excavated and removed from the site. Also, the sanitary sewer line and sand bedding material were excavated and removed, and confirmation soil samples were collected from the surrounding soils. Excavated material included approximately 240 cubic yards (CY) of sand bedding material and 110 CY of lead-impacted soil near the Building 90 test fire room. The excavated material was moved to a temporary stockpile near Building 89 within AOC-65. The material was managed on post on January 17, 2011 as described in waste characterization section below.

1st Confirmation Sampling

The first round of confirmation sampling at AOC-65 was performed on December 17, 2010, and included sanitary sewer line trench bottom samples, and one field duplicate sample collected from the excavated area. Samples were analyzed for metals (CSSA 9 metals). One sidewall sample location (B90SB-02) had lead above the Tier 1 PCL (*i.e.*, the TCEQ-approved background level for lead at CSSA of 84.5 mg/kg) with a concentration of 340 mg/kg. The decision to calculate a Tier 2 PCL for lead had not yet been considered, so the sample area was excavated in order to meet the Tier 1 criteria. Methylene chloride, also known as dichloromethane (DCM), also exceeded its PCL in one sample. The presence of DCM in this sample is attributed to laboratory contamination. DCM is a common laboratory contaminant and there is no known usage of DCM at CSSA. It is also noted that the sample location with DCM was excavated and removed based on the location of lead contamination at the site.

2nd Excavation and Removal

The second round of excavation activities was performed at AOC-65 on February 10, 2011. These activities involved excavation of the soil in the northern area east of Building 90 during sanitary sewer line replacement efforts. Excavated material was moved from AOC-65 to the East Pasture Berm.

Final Confirmation Sampling

On February 10, 2011, a second round of confirmation samples was collected at two locations. Two surface soil samples (AOC65-SS06 and AOC65-SS07) were collected from the excavated area. Both samples were analyzed for lead and the results indicated concentrations were below the PCL (Table 1). Sample locations remaining at the site are shown on Figure 3. The areas where lead was removed are also shown on Figure 3.

Waste Characterization, On-Post Management, and Off-Post Disposal

Waste characterization efforts were performed in accordance with requirements of CSSA's RCRA Facility Investigation (RFI) and Interim Measures (IM) Waste Management Plan – Revised, dated May 2006 (approved by TCEQ in August 2006). Initial results of waste characterization of material removed during the first (December 2010) excavation showed that the impacted media from AOC-65 met both hazardous and non-hazardous criteria (30 TAC §335 Subchapter R). In accordance with the RFI/IM Waste Management Plan, the hazardous soil (for lead) was stabilized within AOC-65 with Phosphate Induced Metal Stabilization (PIMS) apatite II material. The PIMS apatite II material was mixed at a 3% by volume ratio with the contaminated soils. Approximately 240 tons of hazardous characteristic lead-containing soils were treated with approximately 6 tons of apatite II and re-analyzed for TCLP lead. Analysis of treated soils indicated the lead was sequestered to non-hazardous criteria. All generated soils from this IRA was managed on-post within the East Pasture Range Berm (RMU-1) as specified in the work plan provided as **Appendix C** of this tech memo. All waste characterization results are shown in **Table 3** provided at the end of this tech memo.

Additionally, construction debris waste (approximately 18 CY of weathered asphalt and PVC debris) generated from the IRA met Class 2 non-hazardous waste criteria was transported and disposed of off-post at Waste Management, Inc. (WMI), Covel Gardens Landfill in San Antonio, Texas. The waste manifests and profile data, including the waste analytical results, are kept on file at the CSSA Environmental Office.

This report has been prepared to document the results of the IRA at AOC-65. VOC contamination associated with AOC-65 (Building 90) will continue to be investigated.

TABLES AND FIGURES

Table 1 Summary of Investigations and Results at AOC-65

Date	Investigation Description	Type of Analyses	Results †
June 15, 2010 (Vicinity of AOC-65)	XRF survey performed in vicinity of the test fire room at AOC-65. Survey investigated potential metals contamination in soils around Building 90 and AOC-65. A large number of samples were collected within a 200-foot radius of Building 90 and AOC-65.	Metals	Lead contamination was indicated near Building 90 test fire room.
Dec 12– 23, 2010 (AOC-65) See Photos	Soil excavations of the sand bedding material completed and six samples (within sanitary sewer line trench), plus one FD, collected. Bldg90SB-01 Bldg90SB-02 Bldg90SB-03 Bldg90SB-04 Bldg90SB-05 Bldg90SB-05 and FD Bldg90SB-06 MS/MSD Waste Characterization samples collected Bldg90SB-WC01 Bldg90SB-WC02 Bldg90SB-WC03 Bldg90SB-WC04 Bldg90SB-WC05 Bldg90SB-WC06	Nine CSSA metals and waste characterization for Texas 11 metals for all WC samples. TPH included for debris collected on IRA (Bldg90SB-WC05).	Lead above PCL at one trench location. No other sample results exceeded PCLs. Bldg90SB-02 (lead) This sample location within the trench was excavated (see below, December 27, 2010). Waste characterization results showed the material met hazardous criteria for lead on samples Bldg90SB-WC01, Bldg90SB-WC02, and Bldg90SB-WC03. Waste characterization results for the remaining samples met State of Texas non-hazardous criteria.
Dec 24– 28, 2010 (AOC-65) See Photos	Soil excavations near area surrounding Building 90 test fire room completed. Surface soil samples were collected from the surrounding soils. AOC65-SS-01 AOC65-SS-02 AOC65-SS-03 AOC65-SS-04 Bldg90SB-07 and FD Bldg90SB-08	Nine CSSA metals.	Lead exceeded PCLs at surface soil locations near northern portion of AOC-65 excavation.

Table 1 Continued

Date	Investigation Description	Type of Analyses	Results †
Dec 29– Jan 7, 2010/2011 (AOC-65) See Photos	Initiated Excavated soil removal to East Pasture and treatment of contaminated media with PIMS. Collected additional waste characterization samples from treated material. Bldg90SB-WC06 Bldg90SB-WC07	Waste characterization showed the material met Class 2 non-hazardous criteria (30 TAC §335 Subchapter R).	Excavated material was loaded moved to a temporary stockpile within AOC-65 near Building 89. Excavated material included approximately 350 CY of soil, of which 240 CY were treated with PIMS for stabilization of lead. Additionally 18 CY of construction debris was profiled for off-post disposal at Covel Gardens Landfill. Soil was hauled to the on-post East Pasture Berm on Jan 7, 2011.
Feb 10, 2011 (AOC-65)	Final confirmation sampling at two locations after excavation of additional surface soils near samples AOC65-SS01 and AOC65-SS02. AOC65-SS06 AOC65-SS07	Lead	Excavation of surface soils in areas near AOC65-SS01 and AOC65-SS02 sample locations were accomplished prior to collection of AOC65-SS06 and AOC65-SS07.All remaining sample results are within Industrial Tier 1 PCLs.

†Table 2 and Figure 3 show results and locations of soils remaining at the site. Removal areas are also shown on Figure 3.

Table 2. Summary of Chemical Constituents Remaining in Soils at AOC-65

Chemicals Tested	CAS Number	Soil PCLs Commercial/Industrial Source Area 30 acre Tier 1 $^{Tot}Soil_{Comb}$ mg/kg [1]		Tier 1 $^{GW}Soil_{Ing}$ mg/kg [2]			Tier 2 $^{GW}Soil_{Ing}$ mg/kg [2]			TCEQ-Approved Background Metal Concentrations mg/kg [3]	Sample Locations: AOC65-SS01 27-Dec-2010 mg/kg EXCAVATED	Qual	AOC65-SS02 27-Dec-2010 mg/kg EXCAVATED	Qual	AOC65-SS03 27-Dec-2010 mg/kg	Qual	AOC65-SS04 27-Dec-2010 mg/kg	Qual	AOC65-SS05 27-Dec-2010 mg/kg	Qual	AOC65-SS06* 10-Feb-2011 mg/kg	Qual	AOC65-SS07** 27-Dec-2010 mg/kg	Qual	B90SB-01 16-Dec-2010 mg/kg	Qual
Inorganic Metals																										
Arsenic	7440-38-2	196	c	2.51	m	>S				**19.6 ††**	**0.80**	F	**1.9**	F	**2.0**	F	**1.0**	F	0.20	U	--		--		0.20	U
Barium	7440-39-3	119000	n	222	m	>S				**300 †††**	**240**		**45**		**38**		**18**		**8.0**		--		--		**7.7**	
Cadmium	7440-43-9	852	n	0.75	m	>S				**3.0 ††**	**4.2**		**1.7**		**0.50**		**0.90**		**0.71**		--		--		0.03	U
Chromium	7440-47-3	74600	n	**1200**	m	>S				40.2 ††	**230**		**31**		**10**	F	**11**	F	**6.2**	F	--		--		**1.7**	F
Copper	7440-50-8	38900	n	**521**	a	>S				23.2 ††	**80**		**24**		**12**		**51**		**19**		--		--		**12**	
Lead	7439-92-1	**1600**	n	1.51	a	>S	6929	a	>S	84.5 ††	**2,100**		**1,000**		**180**		**160**		**180**		**262**		**35**		**210**	
Mercury	7439-97-6	3.26	n	0.0039	m					**0.77 ††**	**0.080**	F	**0.050**	F	**0.020**	F	**0.050**	F	**1.4**		--		--		**0.020**	F
Nickel	7440-02-0	7930	n	**235**	n	>S				35.5 ††	**9.6**		**9.6**		**6.7**		**6.4**		**5.4**		--		--		**1.4**	F
Zinc	7440-66-6	245000	n	**3525**	n	>S				73.2 ††	**590**		**130**		**49**		**130**		**200**		--		--		**29**	

Chemicals Tested	CAS Number	Soil PCLs Commercial/Industrial Source Area 30 acre Tier 1 $^{Tot}Soil_{Comb}$ mg/kg [1]		Tier 1 $^{GW}Soil_{Ing}$ mg/kg [2]			Tier 2 $^{GW}Soil_{Ing}$ mg/kg [2]			TCEQ-Approved Background Metal Concentrations mg/kg [3]	Sample Locations: B90SB-02 16-Dec-2010 mg/kg EXCAVATED	Qual	B90SB-03 16-Dec-2010 mg/kg	Qual	B90SB-04 16-Dec-2010 mg/kg	Qual	B90SB-05 16-Dec-2010 mg/kg	Qual	B90SB-05-DUP 16-Dec-2010 mg/kg	Qual	B90SB-06 16-Dec-2010 mg/kg	Qual	B90SB-07 27-Dec-2010 mg/kg	Qual	B90SB-08*** 27-Dec-2010 mg/kg	Qual
Inorganic Metals																										
Arsenic	7440-38-2	196	c	2.51	m	>S				**19.6 ††**	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	**1.0**	F	**6.2**	F
Barium	7440-39-3	119000	n	222	m	>S				**300 †††**	**16**		**4.9**		**8.6**		**9.3**		**8.7**		**14**		**19**		**96**	
Cadmium	7440-43-9	852	n	**0.75**	m	>S				**3.0 ††**	0.03	U	0.03	U	0.03	U	0.03	U	0.03	U	0.03	U	**0.25**	F	**0.21**	F
Chromium	7440-47-3	74600	n	**1200**	m	>S				40.2 ††	**7.2**	F	**2.0**	F	**2.7**	F	**3.6**	F	**4.3**	F	**4.8**	F	**3.9**	F	**26**	
Copper	7440-50-8	38900	n	**521**	a	>S				23.2 ††	**47**		**2.1**		**7.3**		**2.5**		**3.0**		**7.8**		**2.8**		**10**	
Lead	7439-92-1	**1600**	n	1.51	a	>S	6929	a	>S	84.5 ††	**340**		**5.6**	F	**38**		**13**		**16**		**73**		**22**		**18**	
Mercury	7439-97-6	3.26	n	0.0039	m					**0.77 ††**	**0.050**	F	**0.020**	F	**0.020**	F	**0.020**	F	**0.020**	F	**0.020**	F	**0.040**	F	0.010	U
Nickel	7440-02-0	7930	n	**235**	n	>S				35.5 ††	**5.1**		**1.5**	F	**2.4**		**2.3**		**2.4**		**3.9**		**2.7**		**17**	
Zinc	7440-66-6	245000	n	**3525**	n	>S				73.2 ††	**240**		**25**		**23**		**19**		**16**		**18**		**43**		**28**	

NOTES:

* Sample collected at same location as AOC65-SS01 after additional removal action.

** Sample collected at same location as AOC65-SS02 after additional removal action.

*** Sample collected at same location as B90SB-02 after additional removal action.

† TCEQ, TRRP Tier 1 Soil PCLs (Last Revised: May 2011).

†† CSSA Soil Background Concentrations. Second Revision, Evaluation of Background Metals Concentrations in Soils and Bedrock at CSSA. February 2002. Values from Table 3.3.

††† Texas-Specific median background concentration.

PCLs and CSSA background values coded in this table as [1, 2, 3].

[1] $^{Tot}Soil_{Comb}$ = PCL for COPC in soil for a 30 acre source area and a potential future industry (combined exposure for ingestion, dermal contact, inhalation of volatiles and particulates, and ingestion of above-ground and below-ground vegetables).

[2] $^{GW}Soil_{Ing}$ = PCL for COPC in soil for a 30 acre source area and a potential future industry (soil-to-groundwater leaching of COPC to Class 1 and 2 groundwater).

[3] CSSA Soil Background Concentrations.

Critical PCLs are shown in **blue** font.

mg/kg = milligrams per kilogram.

c = carcinogenic.

n = noncarcinogenic.

m = primary MCL-based.

a = EPA Action Level-based.

>S = solubility limit exceeded during calculation.

-- = not sampled.

QA NOTES AND DATA QUALIFIERS:

(NO CODE) - Confirmed identification.

U - Analyte was not detected above the indicated Method Detection Limit (MDL).

F - Analyte was positively identified, but the quantitation is an estimation above the MDL and below the Reporting Limit (RL).

Values shown in **BOLD** indicate detections above the MDL.

SHADED values indicate detections above the PCL (subsequently excavated).

Table 3. Summary of Waste Characterization of Soil Media and Debris at AOC-65

Chemicals Tested	B90CD-WC-01 16-Dec-2010 mg/L	Qual	B90SB-WC-01 16-Dec-2010 mg/L	Qual	B90SB-WC-02 16-Dec-2010 mg/L	Qual	B90SB-WC-03 16-Dec-2010 mg/L	Qual	B90SB-WC-04 16-Dec-2010 mg/L	Qual	B90SB-WC-05 16-Dec-2010 mg/L	Qual	Bldg90SB-WC-06 29-Dec-2010 mg/L	Qual	Bldg90SB-WC-07 29-Dec-2010 mg/L	Qual
Petroleum Hydrocarbons																
Petroleum hydrocarbons	16000	U	--		--		--		--		--		--		--	
TCLP Metals																
Antimony	0.0010	U	**0.050**		**0.16**		**0.071**		0.0010	U	**0.011**	F	--		--	
Arsenic	0.0020	U	0.0020	U	0.0020	U	0.0020	U	0.0020	U	0.0020	U	--		--	
Barium	**0.19**		**0.97**		**0.84**		**0.83**		**1.0**		**0.59**		--		--	
Beryllium	0.00020	U	0.00020	U	0.00020	U	0.00020	U	0.00020	U	0.00020	U	--		--	
Cadmium	**0.00070**	F	**0.010**		**0.0089**		**0.017**		**0.020**		**0.024**		--		--	
Chromium	0.0010	U	0.0010	U	0.0010	U	0.0010	U	**0.0030**	F	**0.0030**	F	--		--	
Lead	**0.071**		**6.2**		**15**		**8.0**		**0.86**		**4.0**		**0.0091**	F	**0.046**	
Mercury	0.00010	U	0.00010	U	0.00010	U	0.00010	U	0.00010	U	0.00010	U	--		--	
Nickel	**0.018**		**0.014**		**0.034**		**0.030**		**0.051**		**0.010**		--		--	
Selenium	0.0020	U	0.0020	U	0.0020	U	0.0020	U	0.0020	U	0.0020	U	--		--	
Silver	**0.045**		**0.044**		**0.044**		**0.047**		**0.046**		**0.047**		--		--	

QA NOTES AND DATA QUALIFIERS:

(NO CODE) - Confirmed identification.

U - Analyte was not detected above the indicated Method Detection Limit (MDL).

F - Analyte was positively identified, but the quantitation is an estimation above the MDL and below the Reporting Limit (RL).

Detections are **bolded**.

-- not sampled

APPENDIX A
Site Photographs

Photo 1. Bldg. 89 Sanitary Sewer Line Exposed.
(Photo taken 12-10.)

Photo 2. Building 90 sand bedding materia
(Photo taken 12-10.)

Photo 3. Removed sand bedding material
(Photo taken 12-10.)

Photo 4. Sand Bedding material Removed near Building 90
(Photo taken 12-10.)

Photo 5. Sanitary Sewer Line Location near Building 90 Test Fire Room. (Photo taken 12-20-10.)

Photo 6. PIMS mixing near Building 89. (Photo taken 12-29-10.)

Photo 7. AOC-65 Surface Soil removal near Building 90.
(Photo taken 12-10.)

Photo 8. AOC-65 Top Soil Replacement near Building 90.
(Photo taken 01-11.)

Photo 9. AOC-65 Top Soil Replacement near Building 90 Test Fire Room.
(Photo taken 01-11.)

APPENDIX B
CSSA Dig and Hot Work Permits

CSSA UTILITY CLEARANCE & DIGGING PERMIT

BUILDING OR LOCATION:	**Building 90 – Building 89 - Sewer Line**				
REQUESTOR:	**Chris Beal**	**PHONE NO.:**	**336-1171**	**DATE:**	**11/29/2010**
WORK TO BE PERFORMED BY:	**Parsons**				
DESCRIPTION OF WORK TO BE PERFORMED:					

1) **Remove sewer line and pipe bedding between Bldgs 89 and 90. (see attachment).**

MAP ATTACHED: (Circle One)	Yes	No	**PROPOSED WORK DATES:**	12-13-2010 to 12-31-10	

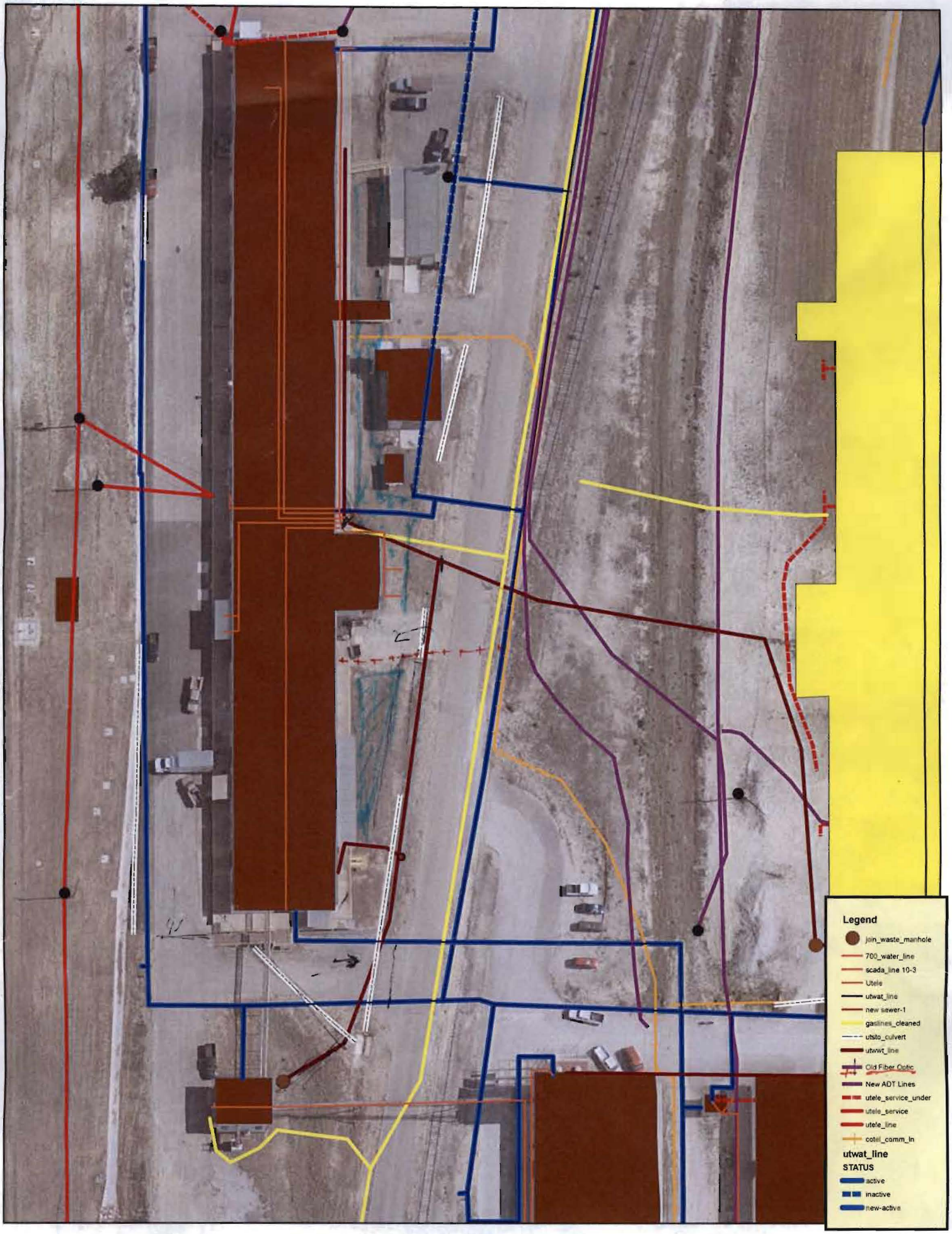
CHECK MARK:					**Activity**	**Outage**
TYPE OF WORK	Hand Digging	X	**UTILITIES IMPACTED**	Water		
	Trenching/Excavation	X		Natural Gas		
	Drilling			Electrical		
	Staking / Driving	X		Communication		
	Other (Specify):			Sewer/Other	Removal-replacement	Minimal

EXCAVATION LIMITS	**Length (ft.):**	~300 ft	**Width (ft.):**	1 Ft 6 In	**Depth (ft.): 0-2 ft**	

CSSA APPROVALS

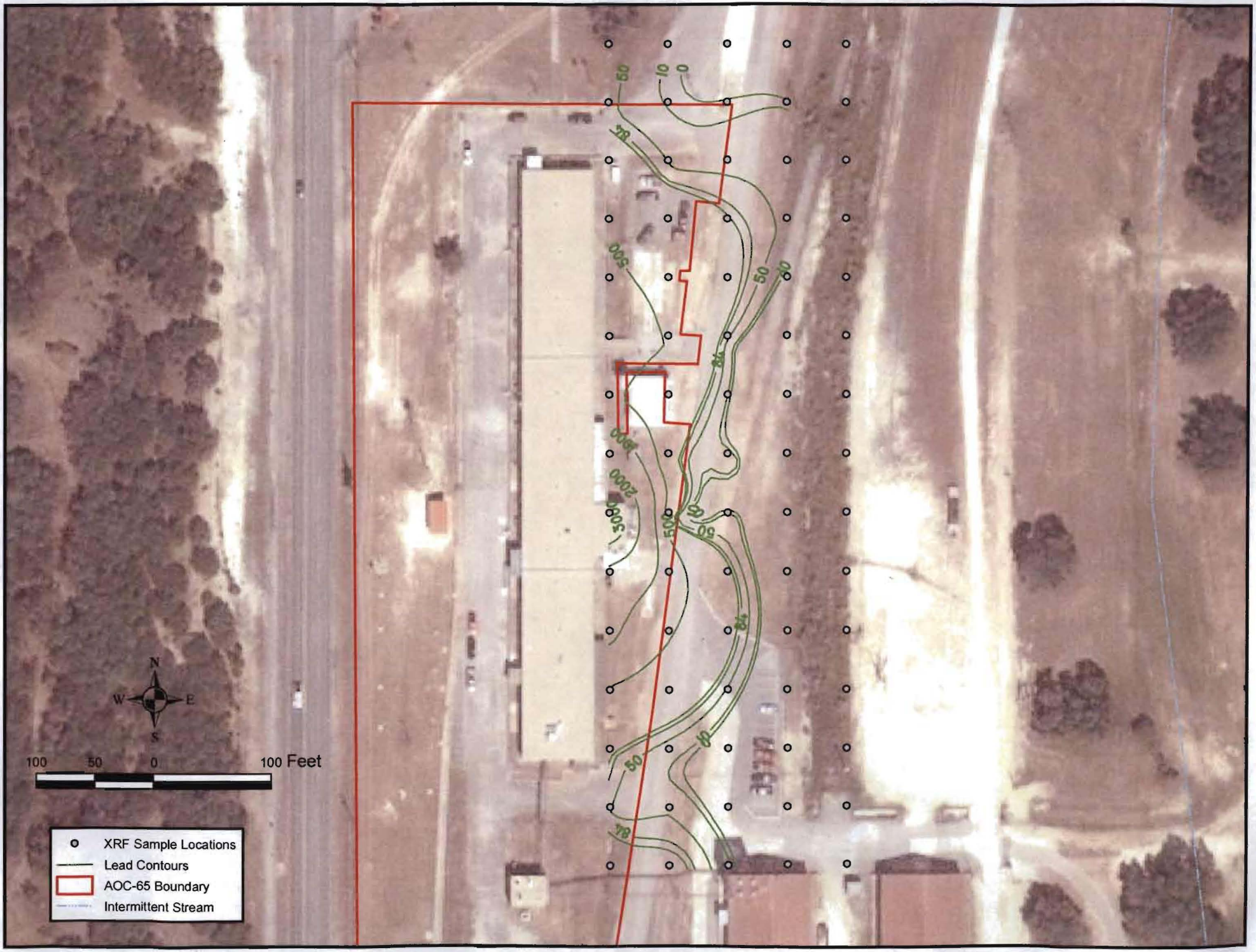
APPROVAL DEPARTMENT	SIGNATURE	DATE
Plumbing / Utilities		12-3-10
Electrical / Utilities		12-13-10
Communications	Gabriele Hoerauf Esquesson	12-13-10
Facility Engineer		12-9-10
Environmental Officer		12-14-2010
GIS / Maps		12/3/10
Safety Officer		12/15/10
Other:		

8/13/2008



70 35 0 70 Feet

k:/gis/sds/mxd/cssa mxds/infastructure/buildings/bldg 90 - Bldg 89 utils.mxd


N
W
E
S
100 50 0 100 Feet
XRF Sample Locations
Lead Contours
AOC-65 Boundary
Intermittent Stream

EMERGENCY/NON-ROUTINE
HOT WORK CHECKLIST

1. LOCATION	2. DATE
outside Bldg. 90	12-14-10

3. TYPE OF WORK	4. START TIME	5. FINISH TIME
GRINDING / SAWING (PARSONS)	0800	1700.

6. PERSON RESPONSIBLE FOR HOT WORK:

Printed name: Casey Wills

Signature: Casey Wills

CHECKLIST	CHECK ONE YES	NO
1. Have combustibles been removed from area? (radius of 35 feet)	✓	
2. If relocation of combustibles is not possible, has a fire watch been designated?	✓	
3. Is there a charged fire extinguisher nearby?	✓	
4. Does the atmosphere in the work area contain dangerous reactive or flammable gases, vapors, liquids, or dusts?		✓
5. Is appropriate personal protective clothing and equipment for the job available and utilized?	✓	
6. Is clothing worn free from grease, oil, solvents, or any flammable substance?	✓	
7. Is the work area protected from sparks and heat with fire-resistant covers or screens?	✓	
8. Have containers been vented before pre-heating, welding, or cutting?		NA
9. Was the work area monitored for at least 30 minutes after the hot work was finished?	✓	
10. Was hot slag disposed of properly?		NA
11. Is there a way to call for emergency assistance?	✓	
12. Was the fire department, safety, or environmental office notified of the work?	✓	

RETURN THIS FORM TO THE SAFETY OFFICE

APPENDIX C

Building 90 Sand Bed Interim Removal Action Work Plan

ADDENDUM TO WORK PLAN
CSSA SITE REMOVAL ACTIONS FOR
LEAD IMPACTED MEDIA AT AOC-65

Parsons is currently under contract to provide removal actions of lead impacted sand bedding associated with the sanitary sewer system located near Building 90 at Camp Stanley Storage Activity (CSSA), Boerne, Texas. This work plan addendum provides description of additional activities to be conducted under Contract W912G-10-D-0026. Activities to be conducted under this contract will follow the provisions of prior work plans in effect and available for review in the CSSA Environmental Encyclopedia, Volume 1, Work Plans.

Background information on the AOC-65 site can be found in Volume 3-1 of the CSSA Environmental Encyclopedia. Additional specific activities associated with these Site Investigations are described in the Resource Conservation and Recovery Act (RCRA) Facility Investigations (RFI) Interim Measures Waste Management Plan (Parsons 2006).

DESCRIPTION

Previous work at AOC-65 included geophysical surveys, soil gas surveys, surface and subsurface sampling, and some removal of waste impacted soils. The lateral extent of metals in the surface soils at AOC-65 were characterized by an X-Ray Fluorescence (XRF) survey. Samples were obtained in a gridded pattern that encompasses the eastern portion of AOC-65 near building 90 (See Figure 1). Additionally, during maintenance activities on the sanitary sewer lines near Building 89 (boiler) and Building 90, both of which are included in AOC-65, sand bedding was identified with lead projectiles crating a potential hazard with maintenance personnel.

Parsons shall perform removal actions of approximately 750 cubic yards of lead-contaminated sand in pipe bedding at AOC-65 and impacted soil media around the eastern portion of Building 90. Waste materials are anticipated to be managed off-post at WMI's Covel Gardens Landfill facility. Non-hazardous metals impacted media are expected to be managed at CSSA's East Pasture Range Berm within Range Management Unit - 1. Waste characterization efforts and management are specified in the RFI/IM WMP Addendum for AOC-65.

LATERAL SURFACE SOILS REMOVAL AND CHARACTERIZATION

To determine the lateral extent and concentration of target COCs in the surface soils near AOC-65, the field team will employ a field portable XRF instrument. This instrument is capable of providing screening level analyte concentration data from either collected or in-situ soil samples. This hand held unit generates an x-ray beam that is emitted from the instrument through the x-ray source window. These x-rays are in turn absorbed by a sample constituent (chemical element), and at the atomic level, an electron is ejected from an inner orbital of the chemical element in question. Subsequently, an outer orbital electron collapses back to fill the inner orbital vacancy. Energy is released

(fluorescence) in this process. The wavelength (color) of the released energy is characteristic of the specific electronic transition, and this wavelength may be used to identify the element involved. The XRF instrument detects this energy and uses the intensity and spectral location of the energy peak to calculate a chemical concentration. The XRF method is primarily used for metals identification and quantification.

The samples will be collected randomly from the excavated area to help in field screening efforts to identify impacted media are excavated. Ten percent of the field gird samples will be collected as duplicates and sent to an analytical laboratory for confirmation of the XRF results. The location of the samples collected for laboratory analysis will be chosen based on results of the XRF survey. The laboratory samples collected will be used to provide definitive date regarding the removal of target COCs.

VERTICAL EXTENT REMOVAL AND CHARACTERIZATION

In addition to the lateral delineation sampling, data will be required to confirm that the vertical extent of contamination has also been removed from the sanitary sewer line excavation as necessary for closure requirements. The vertical extent of contamination may be assessed by sampling the soil-rock underlying the sanitary sewer lines removed as part of the interim measures effort. The sample locations and the sample collection intervals for vertical delineation will be determined after the removal action is completed and is anticipated to have one sample every 50 linear foot of excavated trench collected for COC analysis. Upon completion of the field surveys and data collection, Parsons will prepare a report to document the condition of the sites.

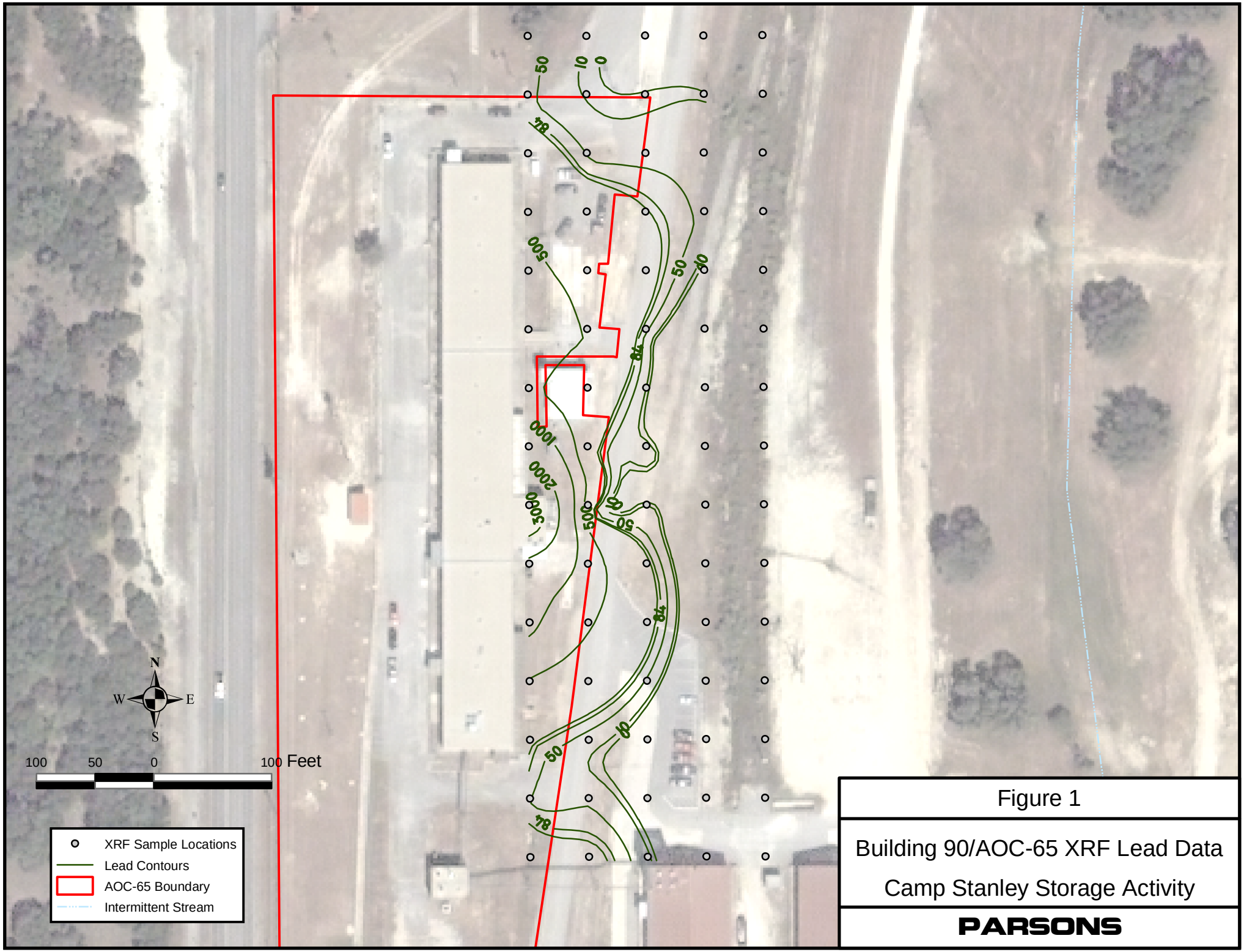


Figure 1

Building 90/AOC-65 XRF Lead Data

Camp Stanley Storage Activity

PARSONS

APPENDIX D

Calculations for Tier 2 $^{GW}Soil_{Ing}$ PCL for Lead (Residential and Commercial/Industrial)

Camp Stanley Storage Activity (SWMU B-34)

Calculations for Tier 2 $^{GW}Soil_{Ing}$ PCL for Lead (Residential and Commercial/Industrial), Camp Stanley Storage Activity (SWMU B-34)

$$^{GW}Soil_{Ing} = \frac{(Critical\ Groundwater\ PCL) \times LDF}{K_{sw}} \times \frac{L_2}{L_1}$$

Equation from "Errata to PCL Equations" TRRP Guidance, March 24, 2000

$$^{GW}Soil_{Ing} = \frac{0.015 \times 10}{0.00055} \times \frac{239.80}{9.50}$$

$^{GW}Soil_{Ing}$ =	**6929.32**	mg/kg

$$K_{SW} = \frac{\rho_b}{\theta_{ws} + K_d \rho_b + H' \theta_{as}}$$

So that:

$$K_{SW} = \frac{1.67}{0.16 + (1830 \times 1.67) + (0 \times 0.21)}$$

$$K_{SW} = \frac{1.67E+00}{3.06E+03}$$

$$K_{SW} = \textbf{5.46E-04}$$

When:

ρ_b	= Soil bulk density (g/cm^3)	1.67E+00
θ_{ws}	= Volumetric water content of vadose zone soils	1.60E-01
K_d	= Soil-water partition coefficient (K_{oc} x foc)	1.83E+03
K_{oc}	= Soil organic carbon-water partition coefficient	--
foc	= fraction organic carbon	8.00E-03
H'	= Henry's Law Constant	0.00E+00
θ_{as}	= Volumetric air content of vadose zone soils	2.10E-01
LDF	= Lateral Dilution Factor	1.00E+01
L_2	= Depth from top of affected soil to groundwater table (ft)	239.80
L_1	= Thickness of affected soil (ft)	9.5

Using:

Groundwater Critical PCL:

$^{GW}GW_{Ing}$	=	1.5E-02	mg/L

H' - from Table 30 TAC 350.73(f).
K_d - from Table 350.73(f)(1)(A).
LDF, ρ_b, θ_{ws}, and θ_{as} using Tier 1 default values from 350.75(c).

Shaded cells represent compound- and site-specific variables

Notes:
Soil pH (7.9); based on pH for Crawford and Bexar soil types
Maximum thickness of affected soil (9.5); based on B34-SB1, B34-SB2, and B34-SB3
Average depth of top of affected soil to gw table (239.8); based on average DTW data for CS-MW18-LGR near B-34. There were a total of 33 measurements between September 2002 and June 2010: min 104.35, max 350.32, and weighted avg
>0.5 acre source area.