

RELEASE INVESTIGATION REPORT

Area of Concern 57 CAMP STANLEY STORAGE ACTIVITY



Prepared for:

Camp Stanley Storage Activity Boerne, Texas

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EXECUTIVE SUMMARY

Area of Concern 57 (AOC-57) is located in the southwest portion of the inner cantonment area of Camp Stanley Storage Activity (CSSA), east and south-east of Magazines A-100, A-101, and A-102, and is approximately 6.3 acres in size. This long, thin area currently situated along a gravel road was previously used for maintenance and storage activities at temporary structures from approximately the 1940s through the 1970s. No trenches or any other signs of disposal are present at the site, and no ammunition or metal debris were found at the site. Based on the absence of waste or contamination, this Release Investigation Report (RIR) requests No Further Action (NFA) at AOC-57.

In summary, activities at AOC-57 as described in this RIR included the following:

- Historical aerial photographs were reviewed for evidence of past waste management.
- A soil gas survey was conducted in the area in January and February 2001 to determine if volatile organic compounds (VOCs) were present.
- Visual and X-ray Fluorescence (XRF) surveys were conducted in December 2010 to look for any signs of waste management or metals contamination in soil.
- Surface soil sampling was conducted in January 2011. Samples were analyzed for VOCs, semi-volatile organic compounds (SVOCs), and the CSSA 9 metals.

From the information summarized above and presented in this report, the results of the investigations at AOC-57 meet the three criteria as described in Texas Commission on Environmental Quality (TCEQ) (2003) guidance *Determining Which Releases are Subject to the Texas Risk Reduction Program (TRRP)*. Thus, the following criteria were met:

- Concentrations of chemicals in soil samples do not exceed Tier 1 residential soil action levels.
- There is no evidence of other affected or threatened environmental media (groundwater, surface water, or sediment) at AOC-57. Since soils were not found to have concentrations of metals above Tier 1 protective concentration limits (PCLs), there will be no impact to groundwater, surface water, or sediment from AOC-57.
- AOC-57 passes the Tier 1 Ecological Exclusion Criteria Checklist (Appendix B).

Because these three criteria are met, AOC-57 is not subject to TRRP. Therefore, this RIR has been prepared to document the results and a NFA decision is requested from the TCEQ.

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ACRONYMS AND ABBREVIATIONS

AOC	Area of concern
APPL	Agriculture & Priority Pollutants Laboratory, Inc.
BCVI	Black-capped vireo
BS	Bexar Shale
BTEX	Benzene, toluene, ethylbenzene, and xylene
CC	Cow Creek
CCV	continuing calibration verification
COC	Chemical of concern
CSSA	Camp Stanley Storage Activity
DQO	Data Quality Objective
DT	dilution test
EB	Equipment blank
EE	Environmental Encyclopedia
ERA	Ecological risk assessment
FD	Field duplicate
FSP	Field Sampling Plan
GCWA	Golden-cheeked warbler
^{GW} Soil _{Ing}	Soil to groundwater ingestion pathway
ICAL	initial calibration
ICP	inductively coupled plasma
ICV	initial calibration verification
LCS	laboratory control sample
LGR	Lower Glen Rose
mg/kg	milligrams per kilogram
MB	method blank
MCL	Maximum Contaminant Level
MDL	method detection limit
MQL	Method quantitation limit
MS	matrix spike
MSD	matrix spike duplicate
NFA	No further action
PCE	Tetrachloroethene
PCL	Protective concentration level
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality Control
RCRA	Resource Conservation and Recovery Act
RIR	Release Investigation Report

RL	Reporting limit
RMU	Range Management Unit
SAP	Sampling and Analysis Plan
SDG	Sample delivery group
SVOC	Semivolatile organic compound
SWMU	Solid waste management unit
T & E	Threatened and endangered
TAC	Texas Administrative Code
TCEQ	Texas Commission on Environmental Quality
^{Tot} Soil _{Comb}	Combined soil (PCL)
TRRP	Texas Risk Reduction Program
UGR	Upper Glen Rose
USEPA	U.S. Environmental Protection Agency
VOC	Volatile organic compound
XRF	x-ray fluorescence
%R	percent recovery
%RPD	relative percent difference

1.0 INTRODUCTION

Parsons is under contract to provide investigations and environmental services for waste sites located at Camp Stanley Storage Activity (CSSA) in Boerne, Texas (**Figure 1**). This contract includes characterization of selected waste sites and preparation of appropriate documentation, including a Release Investigation Report (RIR) for Area of Concern 57 (AOC-57) (**Figure 2**). Area of Concern 57 (AOC-57) is located in the southwest portion of the inner cantonment area of Camp Stanley Storage Activity (CSSA), east and south-east of Magazines A-100, A-101, and A-102, and is approximately 6.3 acres in size. The site was used for storage and maintenance activities at temporary structures from prior to 1952 through 1978. This work was performed in accordance with requirements of the Resource Conservation and Recovery Act (RCRA) 3008(h) Order in effect for 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). This RIR was prepared following TCEQ reporting and documentation requirements for releases that do not trigger applicability to the TRRP rule.

This report describes environmental investigation activities at AOC-57. Work included historical aerial photograph review, visual survey of the site, hand held X-ray Fluorescence (XRF) analysis of soils and soil sampling, and proper documentation of all activities, including preparation of this closure report. All work was performed according to applicable federal, state, and local rules and regulations.

For this report, Section 1 provides the introduction and the documentation to support this RIR. Section 2 provides historical background information for CSSA and for AOC-57. Section 3 describes the objectives and rationale for preparing an RIR for AOC-57 and the findings from environmental investigations for the site. The groundwater and surface water for CSSA and the area near AOC-57 are also described in Section 3. Section 4 summarizes the findings from completing the Tier 1 Ecological Exclusion Criteria Checklist, which is included as an appendix to this RIR. Section 5 summarizes the overall findings and recommendations for the site. All figures and tables are provided at the end of this RIR (pages 9 through 15). References cited in this report can be found in the CSSA Environmental Encyclopedia (EE) ([Volume 1-1, Bibliography](#)) at www.stanley.army.mil.

2.0 HISTORICAL BACKGROUND

2.1 CAMP STANLEY STORAGE ACTIVITY

Camp Stanley Storage Activity is located in northwestern Bexar County, about 19 miles northwest of downtown San Antonio. The installation consists of approximately 4,004 acres immediately east of Ralph Fair Road, and approximately 0.5 mile east of Interstate Highway 10 (**Figure 1**). Camp Bullis borders CSSA on the north, east, and south.

The land where CSSA is located was used for ranching and agriculture until the 1900s. During 1906 and 1907, six tracts of land were purchased by the U.S. Government and designated the Leon Springs Military Reservation. The land included campgrounds and cavalry shelters.

In October 1917, the installation was re-designated Camp Stanley. Extensive construction was started during World War I to provide housing for temporary cantonments and support

facilities. In 1931, the installation was selected as an ammunition depot, and construction of standard magazines and igloo magazines began in 1938. Land was also used to test, fire and overhaul ammunition components. As a result of these historic activities, CSSA has several historical waste sites, including solid waste management units (SWMUs), AOCs, and range management units (RMUs).

The present mission of CSSA is the receipt, storage, issue, and maintenance of ordnance as well as quality assurance testing and maintenance of military weapons and ammunition. Because of its mission, CSSA has been designated a restricted access facility. No changes to the CSSA mission and/or military activities are expected in the future.

2.2 AOC-57

2.2.1 Setting, Size, and Description

AOC-57 is located in the southwest portion of the inner cantonment area of CSSA, east and south-east of Magazines A-100, A-101, and A-102, and is approximately 6.3 acres in size. The site is long and thin and is situated along a gravel road. Additional background information on AOC-57 can be found in [CSSA EE, Volume 3-1](#).

A series of historical aerial photos of the sites are shown on **Figure 3** (photos prior to 1952 did not include coverage of the AOC-57 area). The first three photos (1952, 1966, and 1973) show a single row of roofed structures in the northern half of the site. The 1952 photo also shows disturbed ground throughout the southern half of the site; however this area is progressively less disturbed in later photos. The 1973 photo shows that some of the structures have been removed, and they are no longer visible at all in the 1978 photo. Two rows of similar structures can be seen to the west and south of AOC-57 in the pre-1978 photos. This area has been developed, and in 2010, Building 210 was constructed in its place. None of the photos show evidence of trenching, or other waste disposal or burial activities.

Historical photos of buildings representative of the temporary structures that once existed at AOC-57 are included in **Appendix F**. The photos were taken in the late 1930s through early 1940s. The buildings have ridged walls and canvas-like roofs, and some appear to have been used for supply storage.

2.2.2 Potential Contaminant Sources, Chemicals of Concern, and Previous Investigations

AOC-57 was previously used for maintenance and storage activities at the historic structures described above. Based on sites with known contamination where similar activities took place, it was suspected that volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and metals could have entered surface soils via spills and leaks.

A soil gas survey was performed in the vicinity of AOC-57 in January and February 2001 to determine if VOCs were present in site soils. The soil gas sampling locations are shown on **Figure 4**, and as can be seen on this figure, many of the locations fall within the northern half of AOC-57. Tetrachloroethene (PCE) was the only contaminant detected during the survey, and was reported at a low level equal to the laboratory method detection limit (MDL) in sample location labeled “c-65” on Figure 4. This point is located directly east of Building 90 just across the road and is associated with contamination present at AOC- 65 ([CSSA EE, Volume 3-2](#)). A

detailed table of analytical results is included in the report entitled *Area of Concern 57 Soil Gas Survey Results, January-February 2001* ([CSSA EE, Volume 3-2](#)) and in **Appendix E** of this RIR. The results show that no significant VOC contamination is present in soil gas at AOC-57.

A site walk and XRF survey for lead and zinc was conducted at AOC-57 on December 2 and 3, 2010. Of the detectable metals, the results for lead and zinc have shown a strong statistical correlation with laboratory-verified samples. As such, these metals were used as indicators of potential areas of metals contamination at the site. Sample locations and results for the XRF survey are shown **Figure 5**. The purpose of the XRF survey was to gather field screening data that may indicate the presence of metals above Tier 1 Protective Concentration Levels (PCLs) in surface soils. XRF analytical results for lead and zinc showed no sample locations with concentrations of these two metals above their respective Tier 1 PCLs. During the XRF survey, the site was visually inspected for signs of past trenching or waste disposal activities. No such evidence was encountered.

3.0 OBJECTIVES OF RIR FOR AOC-57

In accordance with TCEQ (2003) guidance, *Determining Which Releases are Subject to TRRP* (www.tceq.state.tx.us/assets/public/remediation/trrp/releasesTRRPrev.pdf), an RIR can be performed for a site when results of an investigation lead to the following conclusions:

- Concentrations of chemicals detected at the site do not exceed Tier 1 residential soil action levels;
- There is no evidence of other affected or threatened environmental media (groundwater, surface water, or sediment) at the site; and
- The site passes the Tier 1 Ecological Exclusion Criteria Checklist (the completed checklist is provided in **Appendix B**).

When these three criteria are met for a site, the release is not subject to TRRP. For such sites, an RIR can be submitted to document the results and an NFA decision can be requested from the TCEQ.

As referred to in the criteria listed above, the Tier 1 residential soil action levels are provided by TCEQ and were selected following TCEQ guidance (TCEQ, 2007). The most current action levels were used (March 2010). These action levels are referred to as PCLs and are selected for each chemical detected at the site (i.e., chemical of concern [COC]). The PCLs are based on the general size of the site, which is also referred to as the “source area” size. If the source area is greater than 0.5 acre, then the source area is assumed to be 30 acres. Thus, the soil action levels for AOC-57 are based on a 30-acre source area. The PCL is then selected based on the lower of the two PCLs listed for either (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 quantitation limit (MQL) is a higher concentration than the PCL, then the higher of the background or MQL is used as the action level. Based on the metals that are most common to past activities at CSSA,

TCEQ has approved background concentrations for nine metals (arsenic, barium, cadmium, chromium, copper, lead, mercury, nickel, and zinc) (Parsons, 2002). The statistically calculated and TCEQ-approved background metal concentrations are shown in **Table 1**, and are also available in the [CSSA EE \(Volume 2, Background Metals Levels\)](#). It is noted that the action levels/PCLs for four of the nine metals are based on the background concentrations (these four metals are arsenic, cadmium, lead, and mercury). Note that the action levels/PCLs for four of the nine metals (arsenic, cadmium, lead, and mercury) are based on their background concentrations.

3.1 FIELD ACTIVITIES AND INVESTIGATIONS

A summary of the soil sampling results at AOC-57 is shown in Table 1 (detected compounds only) and **Appendix C** (all analytes), and sampling locations are shown on Figure 4.

Sampling at AOC-57 was conducted to assess whether historical storage and maintenance activities affected site soils. VOC and SVOC analyses were performed to test for the presence of contaminants commonly associated with disposal sites, and to verify that such contaminants had not been disposed of at this site. Metals (arsenic, barium, cadmium, chromium, copper, lead, mercury, nickel, and zinc) were analyzed for to assess whether any metallic wastes, such as those commonly generated at CSSA, had been disposed of in this area.

Each discrete grab soil sample was collected with a stainless steel hand trowel from a depth of no greater than six inches below ground surface. Photos of the site taken during and after cleanup activities are provided in **Appendix A**.

For all sampling and analytical activities at CSSA, Parsons follows TCEQ-approved Quality Assurance (QA) and Quality Control (QC) procedures as described in the post-wide CSSA Quality Assurance Project Plan (QAPP) which can be found at [CSSA EE, Volume 1-4](#). The detailed CSSA QAPP presents specific policies, organization, functions, and QA/QC requirements for environmental programs at CSSA, including TCEQ-approved analytical methods, reporting limits (RL), and QA/QC procedures.

The CSSA QAPP (1) was prepared for use by contractors that perform environmental services at CSSA to ensure that the data are scientifically valid and defensible; (2) establishes the analytical protocols and documentation requirements to ensure that the samples are collected and analyzed, and that the data are reviewed and validated in a specified manner; and (3) provides detailed guidance for using the Data Quality Objective (DQO) process for specific investigations. The CSSA QAPP and delivery/task order specific Field Sampling Plans (FSP) constitute the CSSA Sampling and Analysis Plan (SAP). The SAP defines data quality for a specific project. Information regarding post-wide and site-specific plans and TCEQ correspondence can be found at [CSSA EE, Volume 1-1, Correspondence](#).

Following the CSSA-specific plans, the investigative soil analyses for AOC-57 were performed using U.S. Environmental Protection Agency (USEPA) *Test Methods for Evaluating Solid Waste* (SW-846): Method 8260B (VOCs); Method 8270C (semi-volatile organic compounds (SVOCs)); Method 6020 (arsenic, barium, cadmium, chromium, copper, lead, nickel, and zinc); and Method 7471A (mercury). All samples were sent to Agriculture & Priority Pollutants Laboratory, Inc. (APPL) for analyses.

3.2 SOIL SAMPLE RESULTS

As shown in Table 1, inorganic metals were detected at low concentrations across the site. None of the sample results showed metal concentrations above the PCLs (or background concentrations when used as the PCLs). No VOCs or SVOCs were detected in soils above their respective MDLs. The data verification summary report for the analytical results is provided in **Appendix D**.

3.3 SITE GEOLOGY/HYDROGEOLOGY

Based on the sampling results and the geological and hydrogeological characteristics of the site, surface water and groundwater have not been affected by historical activities at AOC-57. A description of the geology and hydrogeology of the area is provided below. Additional information on geology, hydrology and physiography at CSSA are also available in the CSSA EE ([Volume 1-1, Background Information Report](#)).

3.3.1 CSSA Geology/Hydrogeology

The Lower Glen Rose (LGR) is the uppermost geologic stratum in the CSSA area. The LGR is a massive, fossiliferous, vuggy limestone that grades upward into thin beds of limestone, marl, and shale. The LGR is approximately 300-330 feet thick in the CSSA area and is underlain by the Bexar Shale (BS) facies of the Hensell Sand, which is estimated to be from 60 to 150 feet thick under the CSSA area. The BS consists of silty dolomite, marl, calcareous shale, and shaley limestone. The geologic strata dip approximately 1 to 2 degrees to the south-southeast at CSSA.

The uppermost hydrogeologic layer at CSSA is the unconfined Upper Trinity aquifer, which consists of the Upper Glen Rose (UGR) Limestone. Locally at CSSA, very low-yielding perched zones of groundwater can exist in the UGR; however, it is very sporadic and seasonal. Transmissivity values are not available for the UGR. Regionally, groundwater flow is thought to be enhanced along the bedding contacts between marl and limestone; however, the hydraulic conductivity between beds is thought to be poor. This interpretation is based on the observation of discordant static water levels in adjacent wells completed in different beds. Principal development of solution channels is limited to evaporite layers in the UGR Limestone.

The Middle Trinity aquifer functions as the primary source of groundwater at CSSA. It consists of the LGR Limestone, the BS, and the Cow Creek (CC) Limestone. The LGR Limestone outcrops north of CSSA, along Cibolo Creek, and within the central and southwestern portions of CSSA. As such, principal recharge into the Middle Trinity aquifer is via precipitation infiltration at outcrops and along creek beds during flood events. At CSSA, the BS is interpreted as a confining layer, except where it is fractured and faulted, allowing vertical flow from the up-dip CC Limestone into the overlying, down-dip LGR. Fractures and faults within the BS may allow hydraulic communication between the LGR and CC Limestones. Regional groundwater flow within the Middle Trinity aquifer is toward the south and southeast and the average transmissivity coefficient is 1,700 gallons per day per feet (Ashworth, 1983). In general, groundwater at CSSA flows in a northeast to southwest direction. However, local flow gradient may vary depending on rainfall, recharge, and possibly well pumping.

3.3.2 AOC-57 Groundwater

No site-specific information regarding groundwater is available. However, between September 2001 and June 2010, measured water levels at well CC-MW7-LGR, which is located approximately 637 feet west of the site, have ranged from 33.1 feet below top of casing (December 2004) to 291.1 feet below top of casing (September 2006). Low concentrations of VOCs detected in CC-MW7-LGR (below their respective Maximum Contaminant Levels [MCLs]) are attributed to contaminated groundwater from Plume 1.

3.3.3 AOC-57 Surface Water

The closest perennial surface water body to AOC-57 is an unnamed tributary approximately 50 feet west of the site (**Figure 6**). The tributary drains to the W-Tank, located approximately 1,000 feet to the south of AOC-57 (Figure 2). The W-tank, which is fed by precipitation, is located along the westernmost unnamed tributary of Upper Leon Creek. At this point along the unnamed tributary, the distance to Upper Leon Creek is 4,375 feet.

The nearest classified creek downgradient from AOC-57 is Upper Leon Creek. The creek is classified as a perennial stream. Upper Leon Creek is classified under Texas Surface Water Quality Standards as Segment 1907 from a point 330 feet upstream of State Highway 16 northwest of San Antonio in Bexar County to a point 5.6 miles upstream of Scenic Loop Road north of Helotes in Bexar County. The designated uses of Segment 1907 are high aquatic life, contact recreation, public water supply, and aquifer protection. No significant degradation of high quality receiving waters is anticipated from AOC-57.

4.0 TIER 1 ECOLOGICAL EXCLUSION CRITERIA CHECKLIST

In accordance with TCEQ (2003) guidance, an RIR is submitted when the results of an investigation lead to a conclusion that COCs do not exceed Tier 1 residential soil action levels and there is no evidence of other affected media. The site must also pass the Tier 1 Ecological Exclusion Criteria Checklist. The checklist must be completed as part of the RIR for a site. The completed checklist is provided in Appendix B. Results show that the site passes the checklist and that there are no ecological exposure pathways of concern at AOC-57. Thus, based on the absence of any complete or significant ecological exposure pathways, AOC-57 may be excluded from further ecological assessment.

5.0 SUMMARY AND RECOMMENDATIONS

AOC-57 is located in the southwest portion of the inner cantonment area of CSSA, east and south-east of Magazines A-100, A-101, and A-102, and is approximately 6.3 acres in size. This long, thin area currently situated along a gravel road was previously used for storage and maintenance activities at temporary structures from approximately the 1940s through the 1970s. No trenches or any other signs of disposal are present at the site, and no ammunition or metal debris were found at the site.

From the information summarized above and presented in this report, the results of the investigations at AOC-57 meet the three criteria as described in TCEQ (2003) guidance *Determining Which Releases are Subject to the Texas Risk Reduction Program (TRRP)*. Thus, the following criteria were met:

- Concentrations of chemicals in soil samples do not exceed Tier 1 residential soil action levels.
- There is no evidence of other affected or threatened environmental media (groundwater, surface water, or sediment) at AOC-57. Since soils were not found to have concentrations of metals above Tier 1 PCLs, there will be no impact to groundwater, surface water, or sediment from AOC-57.
- AOC-57 passes the Tier 1 Ecological Exclusion Criteria Checklist (Appendix B).

Because these three criteria are met, AOC-57 is not subject to TRRP. Therefore, this RIR has been prepared to document the results and an NFA decision is requested from the TCEQ.

TABLES AND FIGURES

Table 1. Summary of Chemical Constituents Remaining in Soils at AOC-57

Chemicals Tested	CAS Number	Tier 1 Soil PCLs [†]		TCEQ-Approved CSSA Background Metal Concentrations ^{**}	Sample Locations																				
		Residential			AOC57-SS01						AOC57-SS05														
		Source Area 30 acre			Qual	DF	Qual	DF	Qual	DF	Qual	DF	Qual	DF	Qual	DF									
Soil mg/kg	Soil mg/kg	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg											
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]										
Volatile Organics p-Cymene (p-	99-87-6	2.50E+03	n	1.20E+02	n	na	0.0022	F	1	--	--	0.0016	U	1	0.0015	M	1	--							
Inorganic Metals																									
Arsenic	7440-38-2	24.2	n	2.5	m	>S	19.6	4.4	F	1	2.1	F	1	4.4	F	1	3.3	F	1	3.6	M	1	2.2	F	1
Barium	7440-39-3	7840.5	n	221.9	m	>S	186	41	F	1	26	F	1	59	F	1	40	F	1	40	M	1	26	F	1
Cadmium	7440-43-9	52.4	n	0.8	m	>S	3.0	0.22	F	1	0.16	F	1	0.21	F	1	0.15	F	1	0.15	M	1	0.14	F	1
Chromium	7440-47-3	23053.9	n	1200.1	m	>S	40.2	12	F	1	7.2	F	1	16	F	1	10	F	1	12	M	1	6.9	F	1
Copper	7440-50-8	547.6	n	521.2	a	>S	23.2	6.7	F	1	6.2	F	1	7.3	F	1	4.6	F	1	5.0	M	1	4.9	F	1
Lead	7439-92-1	500.0	n	1.5	a	>S	84.5	14	F	1	19	F	1	10	F	1	7.9	F	1	8.8	M	1	7.0	F	1
Mercury	7439-97-6	2.1	n	0.0	m		0.8	0.040	F	1	0.030	F	1	0.020	F	1	0.030	F	1	0.030	F	1	0.020	F	1
Nickel	7440-02-0	832.1	n	78.7	n	>S	35.50	8.7	F	1	5.1	F	1	12	F	1	6.6	F	1	7.4	M	1	4.9	F	1
Zinc	7440-66-6	9921.5	n	1180.2	n	>S	73.2	19	F	1	22	F	1	28	F	1	16	F	1	18	M	1	11	F	1

Chemicals Tested	CAS Number	Tier 1 Soil PCLs [†]		TCEQ-Approved CSSA Background Metal Concentrations ^{**}	Sample Locations																	
		Residential			AOC57-SS06						AOC57-SS10											
		Source Area 30 acre			Qual	DF	Qual	DF	Qual	DF	Qual	DF	Qual	DF	Qual	DF						
Soil mg/kg	Soil mg/kg	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg								
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]							
Volatile Organics p-Cymene (p-	99-87-6	2.50E+03	n	1.20E+02	n	na	--	--	0.0014	U	1	--	0.0015	U	1	--						
Inorganic Metals																						
Arsenic	7440-38-2	24.2	n	2.5	m	>S	19.6	2.7	F	1	2.4	F	1	1.8	F	1	2.6	F	1	3.2	F	1
Barium	7440-39-3	7840.5	n	221.9	m	>S	186	32	F	1	36	F	1	20	F	1	16	F	1	31	F	1
Cadmium	7440-43-9	52.4	n	0.8	m	>S	3.0	0.19	F	1	0.13	F	1	0.16	F	1	0.15	F	1	0.17	F	1
Chromium	7440-47-3	23053.9	n	1200.1	m	>S	40.2	8.3	F	1	7.6	F	1	6.0	F	1	7.1	F	1	10	F	1
Copper	7440-50-8	547.6	n	521.2	a	>S	23.2	7.3	F	1	4.3	F	1	4.6	F	1	5.3	F	1	7.0	F	1
Lead	7439-92-1	500.0	n	1.5	a	>S	84.5	13	F	1	7.0	F	1	9.9	F	1	8.7	F	1	16	F	1
Mercury	7439-97-6	2.1	n	0.0	m		0.8	0.040	F	1	0.020	F	1	0.020	F	1	0.030	F	1	0.060	F	1
Nickel	7440-02-0	832.1	n	78.7	n	>S	35.50	6.1	F	1	6.0	F	1	4.4	F	1	5.7	F	1	6.8	F	1
Zinc	7440-66-6	9921.5	n	1180.2	n	>S	73.2	22	F	1	11	F	1	8.9	F	1	14	F	1	28	F	1

NOTES:
 † TCEQ, TRRP Tier 1 Soil PCLs (Last Revised: March 25, 2009).
 † † CSSA Soil Background Concentrations. Second Revision, Evaluation of Background Metals Concentrations in Soils and Bedrock at CSSA. February 2002. Values from Table 3.3. PCLs and CSSA background values coded in this table as [1, 2, 3].
 [1] [†]Soil_{comb} = PCL for COPC in soil for a 30 acre source area and a potential future resident (combined exposure for ingestion, dermal contact, inhalation of volatiles and particulates, and ingestion of above-ground and below-ground vegetables).
 [2] [†]Soil_{ing} = PCL for COPC in soil for a 30 acre source area and a potential future resident (soil-to-groundwater leaching of COPC to Class 1 and 2 groundwater).
 [3] CSSA Soil Background Concentrations.
 PCLs for detected compounds 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.
 na = not applicable.
 -- = not analyzed.

QA NOTES AND DATA QUALIFIERS:
 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).
 M = Concentration is estimated due to a matrix effect.
 Values shown in **BOLD** indicate detections above the MDL.

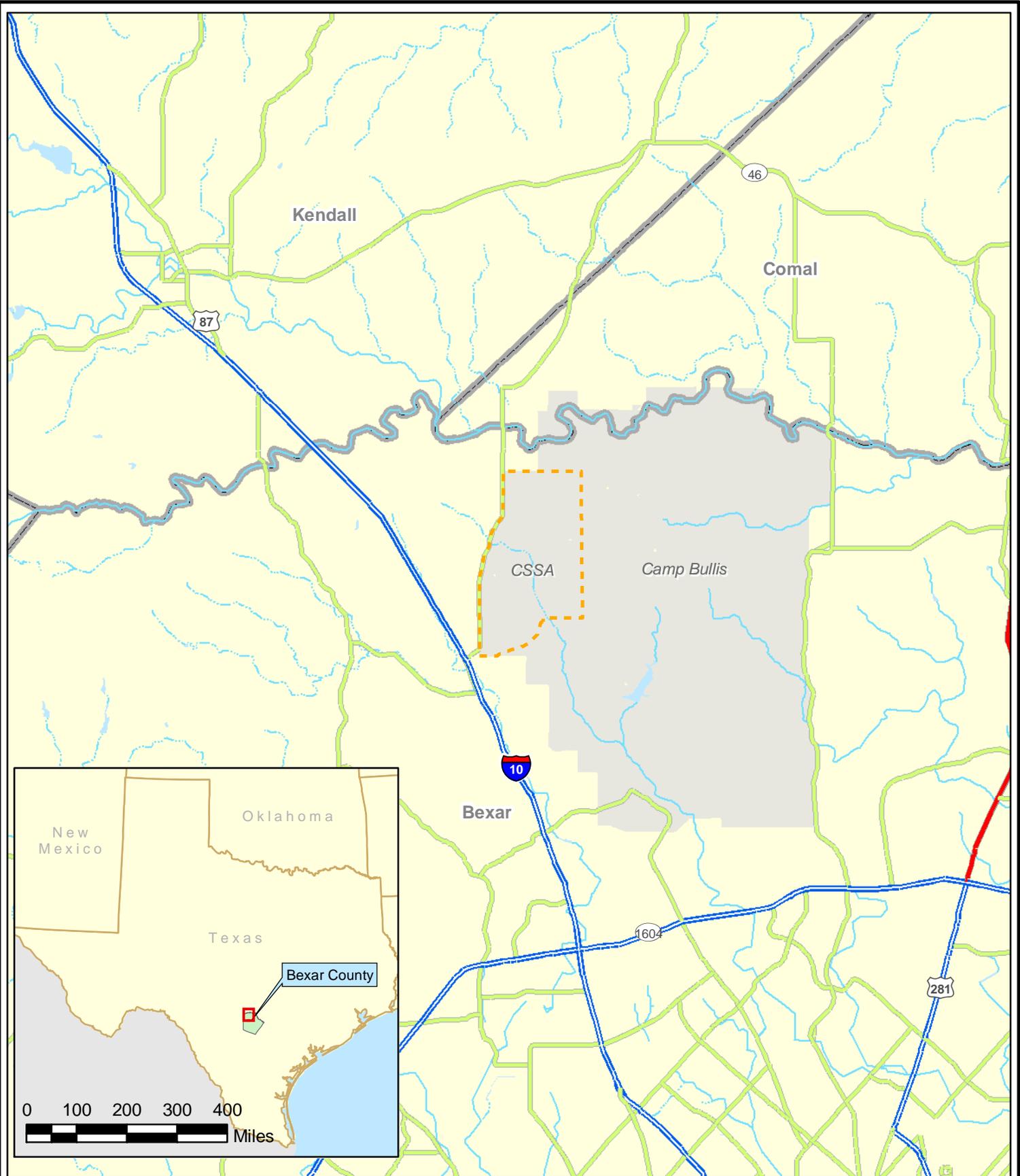


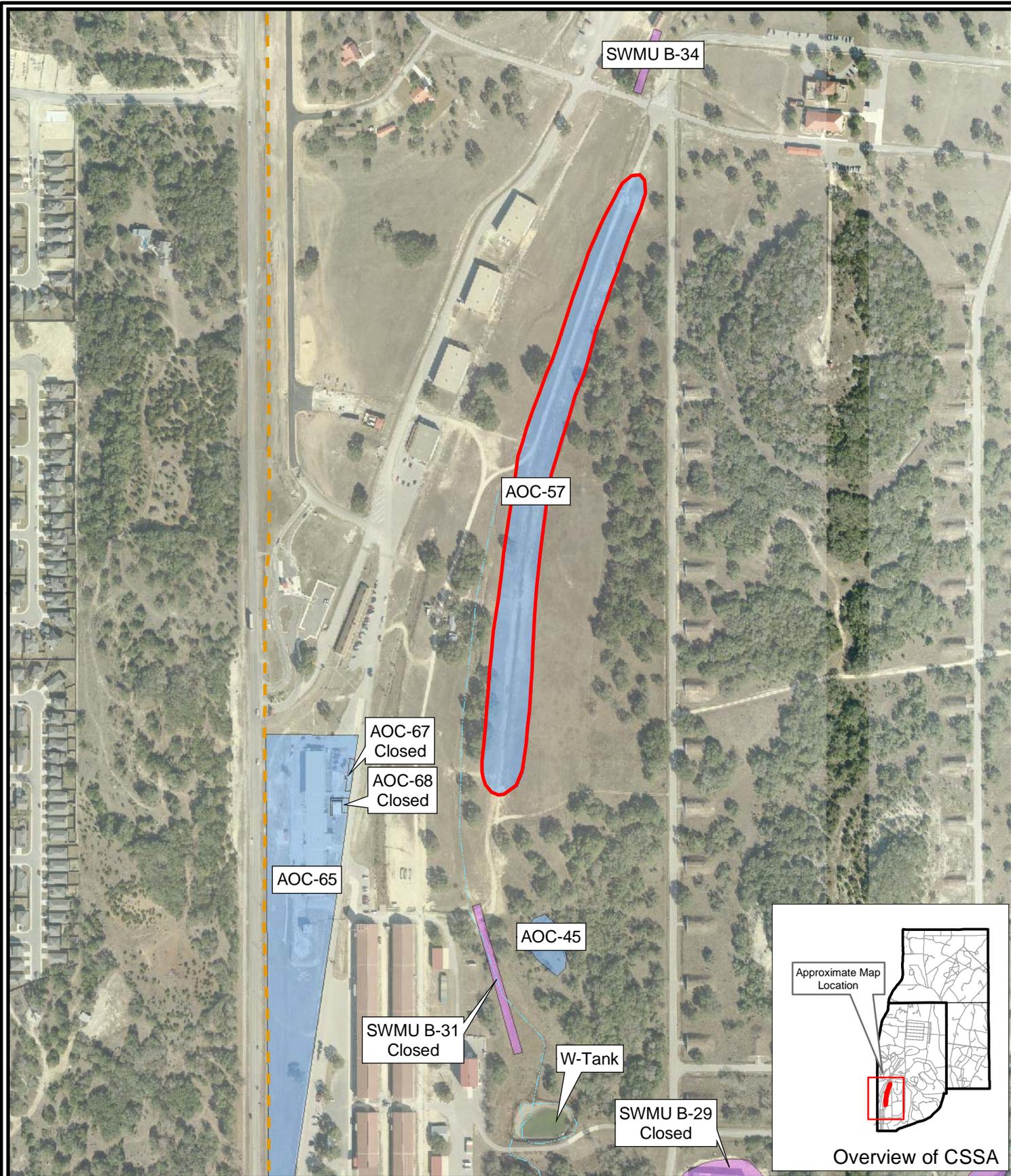
Figure 1

CSSA Location Map
Camp Stanley Storage Activity

PARSONS



- CSSA
- Freeway
- Highway
- Major Road
- County Boundary
- Military Installation



Aerial Photo Date: 2009



450 225 0 450 Feet

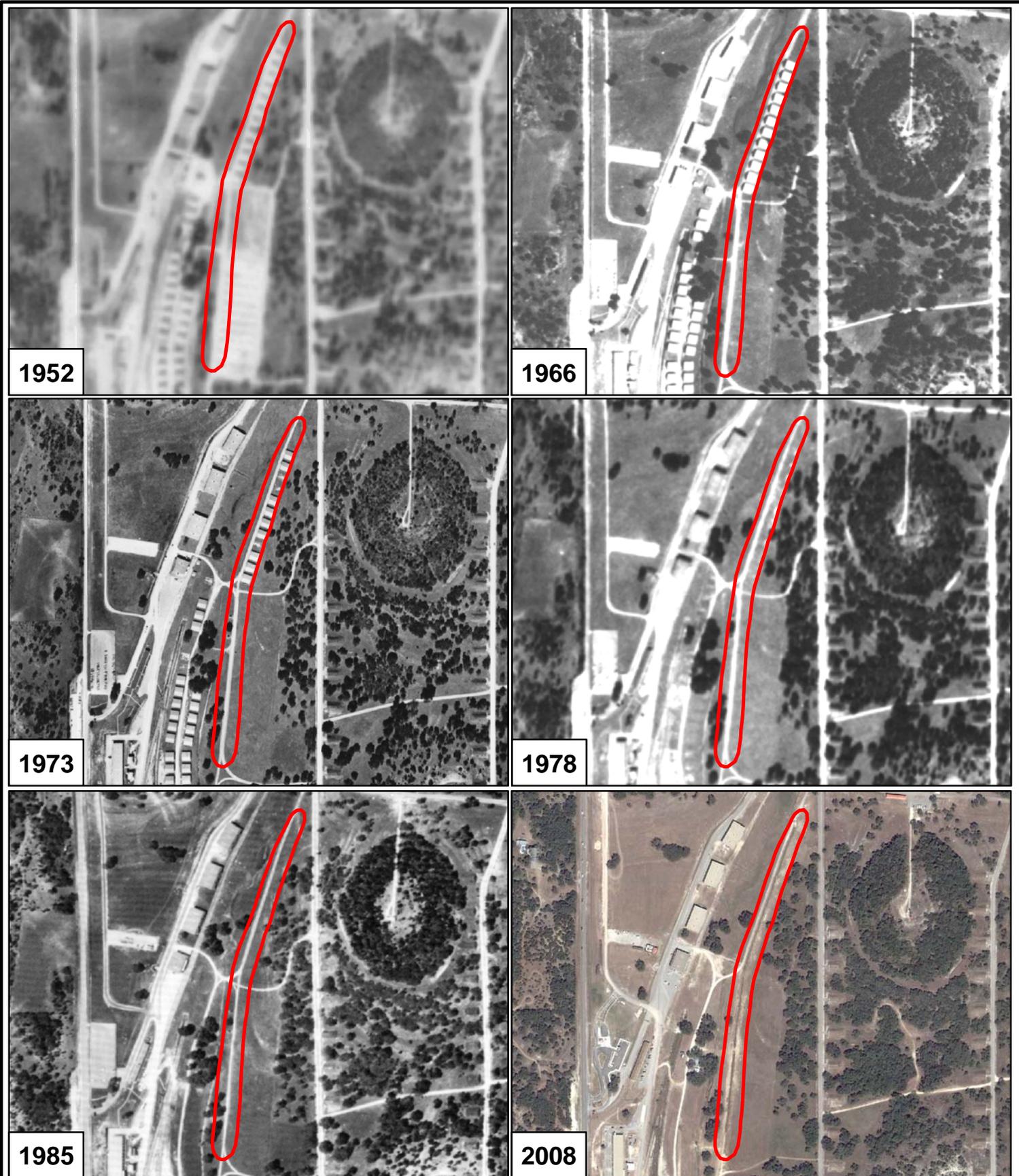


- AOC-57
- AOC Boundary
- SWMU Boundary
- Stream
- CSSA Outer Fence Line

Figure 2

AOC-57
Site Location Map
Camp Stanley Storage Activity

PARSONS



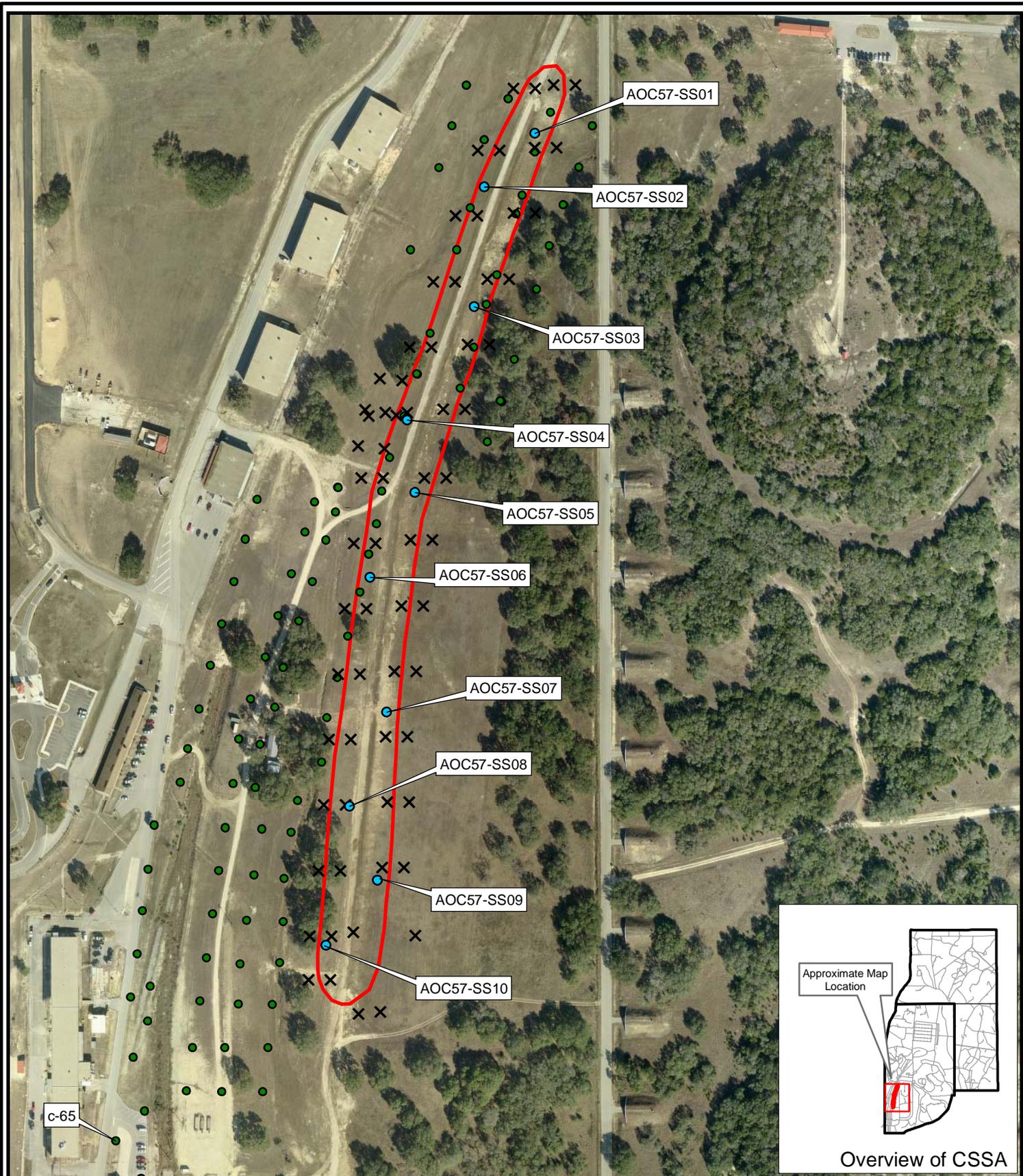
 AOC-57 boundary

0 400 800 1,600
Feet

Figure 3

AOC-57
Aerial Photographs
Camp Stanley Storage Activity

PARSONS



Aerial Photo Date: 2009



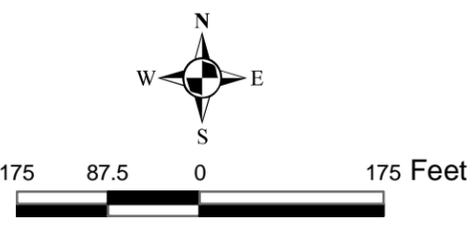
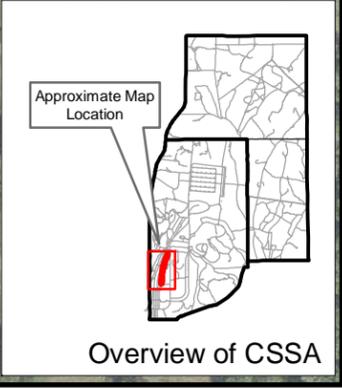
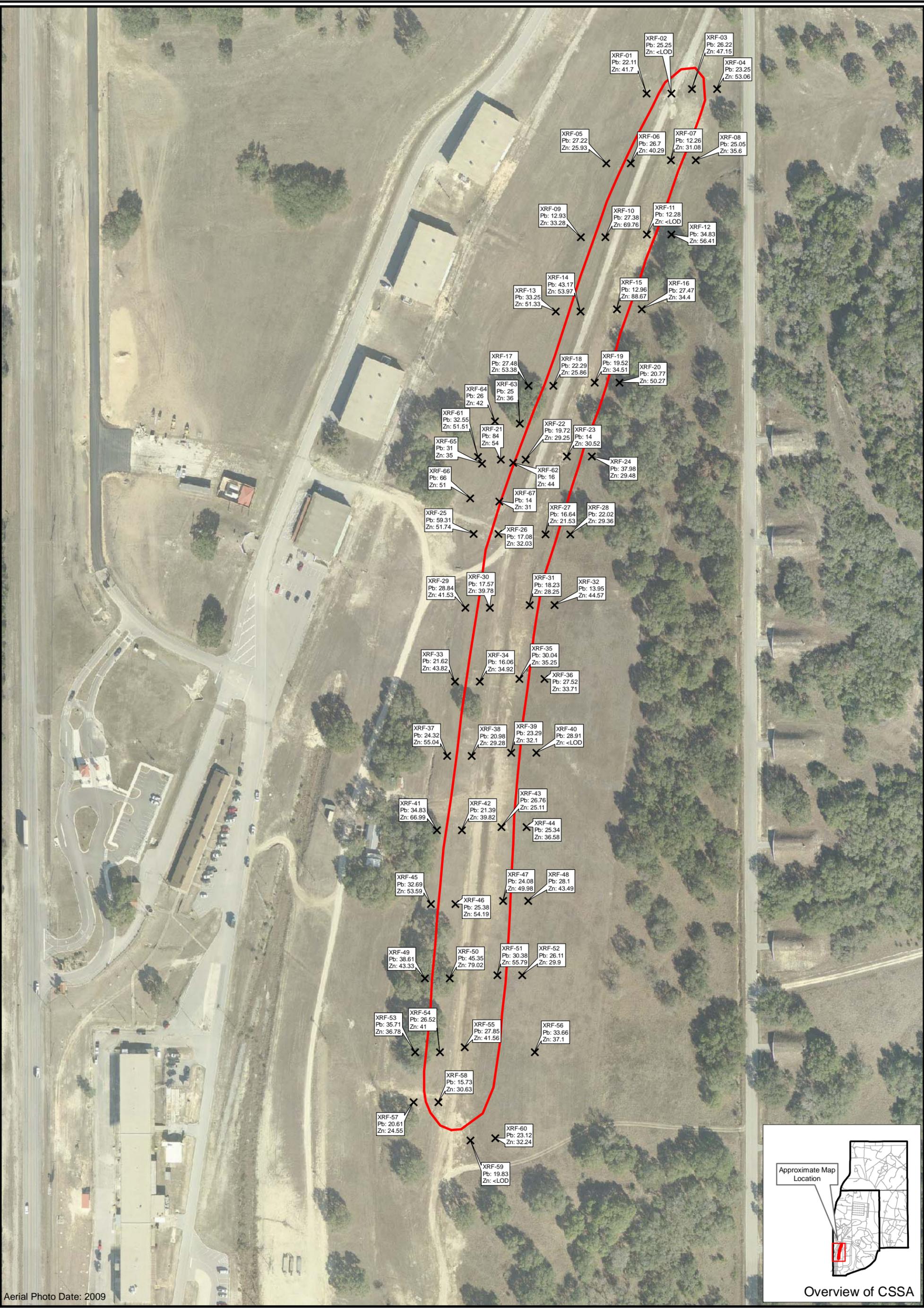
300 150 0 300 Feet

- Soil Sample, 1/2011
- ✕ XRF Sample, 12/2010
- Soil Gas Sample, 1/2001
- AOC-57 Boundary

Figure 4

AOC-57
Sample Locations
Camp Stanley Storage Activity

PARSONS



X XRF Sample, 12/2010
 "LOD" = Level of Detection
 AOC-57 Boundary

Figure 5
 AOC-57
 XRF Survey Results
 Camp Stanley Storage Activity
PARSONS

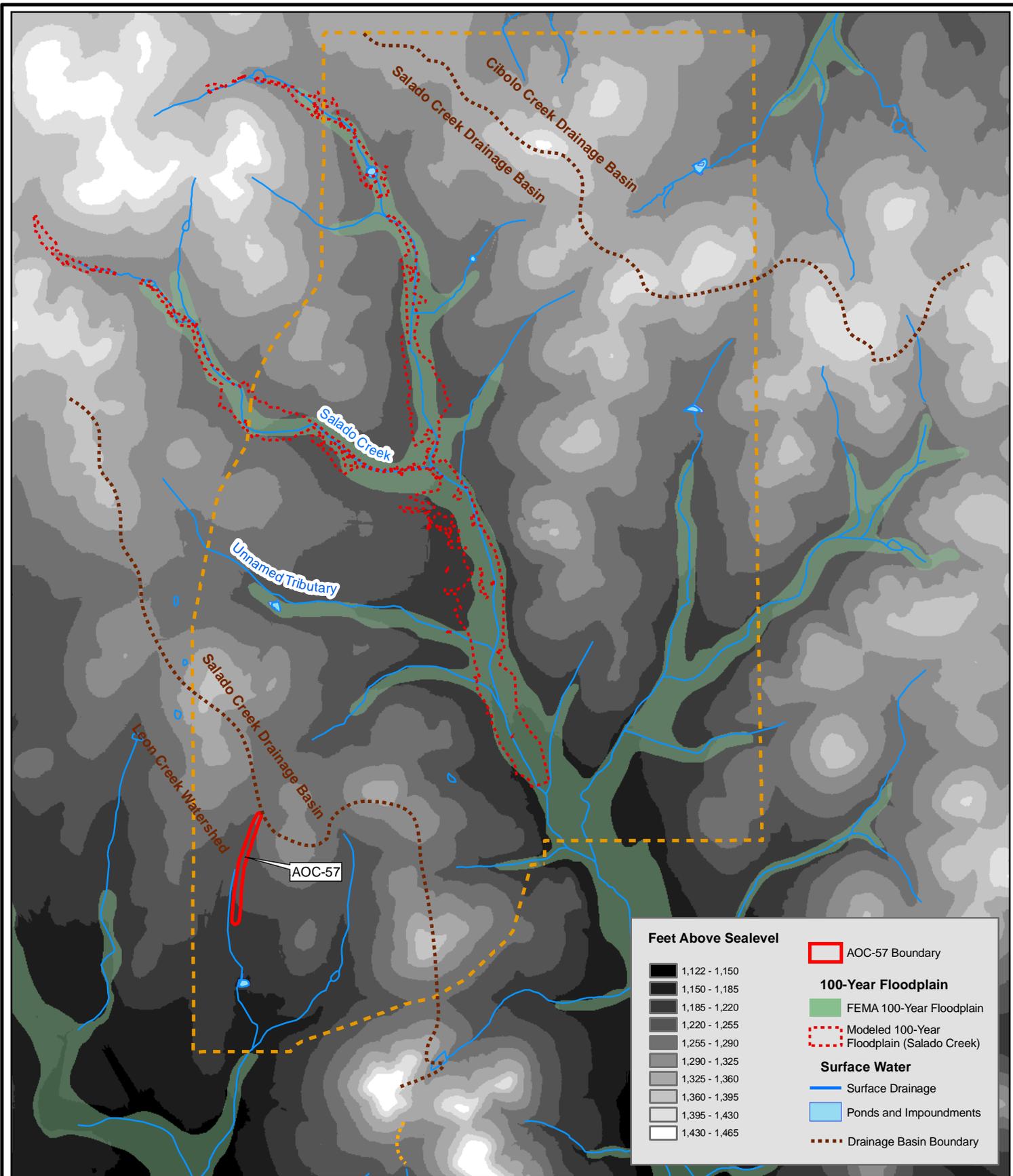


Figure 6

AOC-57 Topography,
Surface Water, and Floodplains
Camp Stanley Storage Activity

PARSONS



APPENDIX A
Site Photographs



Photo 1. AOC-57 looking south from most northern point (March 2011).



Photo 2. Northern portion of AOC-57 looking north from midpoint (March 2011).



Photo 3. Southern portion of AOC-57 looking south from midpoint (March 2011).



Photo 4. Soil sample collection at AOC-57.



Photo 5. Soil sample collection at AOC-57, looking south-southwest. Buildings in the background from left to right: A100, A101, A102.

APPENDIX B
Tier 1 Ecological Exclusion Criteria Checklist

Figure: 30 TAC §350.77(b)

TIER 1: Exclusion Criteria Checklist

This exclusion criteria checklist is intended to aid the person and the TNRCC in determining whether or not further ecological evaluation is necessary at an affected property where a response action is being pursued under the Texas Risk Reduction Program (TRRP). Exclusion criteria refer to those conditions at an affected property which preclude the need for a formal ecological risk assessment (ERA) because there are **incomplete or insignificant ecological exposure pathways** due to the nature of the affected property setting and/or the condition of the affected property media. This checklist (and/or a Tier 2 or 3 ERA or the equivalent) must be completed by the person for all affected property subject to the TRRP. The person should be familiar with the affected property but need not be a professional scientist in order to respond, although some questions will likely require contacting a wildlife management agency (i.e., Texas Parks and Wildlife Department or U.S. Fish and Wildlife Service). The checklist is designed for general applicability to all affected property; however, there may be unusual circumstances which require professional judgement in order to determine the need for further ecological evaluation (e.g., cave-dwelling receptors). In these cases, the person is strongly encouraged to contact TNRCC before proceeding.

Besides some preliminary information, the checklist consists of three major parts, **each of which must be completed unless otherwise instructed**. PART I requests affected property identification and background information. PART II contains the actual exclusion criteria and supportive information. PART III is a qualitative summary statement and a certification of the information provided by the person. **Answers should reflect existing conditions and should not consider future remedial actions at the affected property**. Completion of the checklist should lead to a logical conclusion as to whether further evaluation is warranted. Definitions of terms used in the checklist have been provided and users are strongly encouraged to familiarize themselves with these definitions before beginning the checklist.

Name of Facility:

Camp Stanley Storage Activity (CSSA), Boerne, Texas.

Affected Property Location:

Area of Concern 57 (AOC-57) is located in the southwest portion of the inner cantonment area of Camp Stanley Storage Activity (CSSA), east and south-east of Magazines A-100, A-101, and A-102, and is approximately 6.3 acres in size.

Mailing Address:

**Camp Stanley Storage Activity
25800 Ralph Fair Road
Boerne, TX 78015**

TNRCC Case Tracking #s:

**Water Customer No.: CN602728206.
Air Customer No.: CN600126262.**

Solid Waste Registration #s:

Texas Solid Waste Registration No.: 69026.

Voluntary Cleanup Program #: **Not applicable.**

EPA I.D. #s:

USEPA Identification No.: TX2210020739.

Figure: 30 TAC §350.77(b)

Definitions¹

Affected property - The entire area (i.e., on-site and off-site; including all environmental media) which contains releases of chemicals of concern at concentrations equal to or greater than the assessment level applicable for residential land use and groundwater classification.

Assessment level - A critical protective concentration level for a chemical of concern used for affected property assessments where the human health protective concentration level is established under a Tier 1 evaluation as described in §350.75(b) of this title (relating to Tiered Human Health Protective Concentration Level Evaluation), except for the protective concentration level for the soil-to-groundwater exposure pathway which may be established under Tier 1, 2, or 3 as described in §350.75(i)(7) of this title, and ecological protective concentration levels which are developed, when necessary, under Tier 2 and/or 3 in accordance with §350.77(c) and/or (d), respectively, of this title (relating to Ecological Risk Assessment and Development of Ecological Protective Concentration Levels).

Bedrock - The solid rock (i.e., consolidated, coherent, and relatively hard naturally formed material that cannot normally be excavated by manual methods alone) that underlies gravel, soil or other surficial material.

Chemical of concern - Any chemical that has the potential to adversely affect ecological or human receptors due to its concentration, distribution, and mode of toxicity. Depending on the program area, chemicals of concern may include the following: solid waste, industrial solid waste, municipal solid waste, and hazardous waste as defined in Texas Health and Safety Code, §361.003, as amended; hazardous constituents as listed in 40 Code of Federal Regulations Part 261, Appendix VIII, as amended; constituents on the groundwater monitoring list in 40 Code of Federal Regulations Part 264, Appendix IX, as amended; constituents as listed in 40 CFR Part 258 Appendices I and II, as amended; pollutant as defined in Texas Water Code, §26.001, as amended; hazardous substance as defined in Texas Health and Safety Code, §361.003, as amended, and the Texas Water Code §26.263, as amended; regulated substance as defined in Texas Water Code §26.342, as amended and §334.2 of this title (relating to Definitions), as amended; petroleum product as defined in Texas Water Code §26.342, as amended and §334.122(b)(12) of this title (relating to Definitions for ASTs), as amended; other substances as defined in Texas Water Code §26.039(a), as amended; and daughter products of the aforementioned constituents.

Community - An assemblage of plant and animal populations occupying the same habitat in which the various species interact via spatial and trophic relationships (e.g., a desert community or a pond community).

Complete exposure pathway - An exposure pathway where a human or ecological receptor is exposed to a chemical of concern via an exposure route (e.g., incidental soil ingestion, inhalation of volatiles and particulates, consumption of prey, etc).

De minimus - The description of an area of affected property comprised of one acre or less where the ecological risk is considered to be insignificant because of the small extent of contamination, the absence of protected species, the availability of similar unimpacted habitat nearby, and the lack of adjacent sensitive environmental areas.

Ecological protective concentration level - The concentration of a chemical of concern at the point of exposure within an exposure medium (e.g., soil, sediment, groundwater, or surface water) which is determined in accordance with §350.77(c) or (d) of this title (relating to Ecological Risk Assessment and Development of Ecological Protective Concentration Levels) to be protective for ecological receptors. These concentration levels are primarily intended to be protective for more mobile or wide-ranging ecological receptors and, where appropriate, benthic invertebrate communities within the waters in the state. These concentration levels are not intended to be directly protective of receptors with limited mobility or range (e.g., plants, soil invertebrates, and small rodents), particularly those residing within active areas of a facility, unless these receptors are threatened/endangered species or unless impacts to these receptors result in disruption of the ecosystem or other unacceptable consequences for the more

¹These definitions were taken from 30 TAC §350.4 and may have both ecological and human health applications. For the purposes of this checklist, it is understood that only the ecological applications are of concern.

mobile or wide-ranging receptors (e.g., impacts to an off-site grassland habitat eliminate rodents which causes a desirable owl population to leave the area).

Ecological risk assessment - The process that evaluates the likelihood that adverse ecological effects may occur or are occurring as a result of exposure to one or more stressors; however, as used in this context, only chemical stressors (i.e., COCs) are evaluated.

Environmental medium - A material found in the natural environment such as soil (including non-waste fill materials), groundwater, air, surface water, and sediments, or a mixture of such materials with liquids, sludges, gases, or solids, including hazardous waste which is inseparable by simple mechanical removal processes, and is made up primarily of natural environmental material.

Exclusion criteria - Those conditions at an affected property which preclude the need to establish a protective concentration level for an ecological exposure pathway because the exposure pathway between the chemical of concern and the ecological receptors is not complete or is insignificant.

Exposure medium - The environmental medium or biologic tissue in which or by which exposure to chemicals of concern by ecological or human receptors occurs.

Facility - The installation associated with the affected property where the release of chemicals of concern occurred.

Functioning cap - A low permeability layer or other approved cover meeting its design specifications to minimize water infiltration and chemical of concern migration, and prevent ecological or human receptor exposure to chemicals of concern, and whose design requirements are routinely maintained.

Landscaped area - An area of ornamental, or introduced, or commercially installed, or manicured vegetation which is routinely maintained.

Off-site property (off-site) - All environmental media which is outside of the legal boundaries of the on-site property.

On-site property (on-site) - All environmental media within the legal boundaries of a property owned or leased by a person who has filed a self-implementation notice or a response action plan for that property or who has become subject to such action through one of the agency's program areas for that property.

Physical barrier - Any structure or system, natural or manmade, that prevents exposure or prevents migration of chemicals of concern to the points of exposure.

Point of exposure - The location within an environmental medium where a receptor will be assumed to have a reasonable potential to come into contact with chemicals of concern. The point of exposure may be a discrete point, plane, or an area within or beyond some location.

Protective concentration level - The concentration of a chemical of concern which can remain within the source medium and not result in levels which exceed the applicable human health risk-based exposure limit or ecological protective concentration level at the point of exposure for that exposure pathway.

Release - Any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment, with the exception of:

- (A) A release that results in an exposure to a person solely within a workplace, concerning a claim that the person may assert against the person's employer;
- (B) An emission from the engine exhaust of a motor vehicle, rolling stock, aircraft, vessel, or pipeline pumping station engine;
- (C) A release of source, by-product, or special nuclear material from a nuclear incident, as those terms are defined by the Atomic Energy Act of 1954, as amended (42 U.S.C. §2011 et seq.), if the release is subject to requirements concerning financial protection established by the Nuclear Regulatory Commission under §170 of that Act;
- (D) For the purposes of the environmental response law §104, as amended, or other response action, a release of source, by-product, or special nuclear material from a processing site designated under

§102(a)(1) or §302(a) of the Uranium Mill Tailings Radiation Control Act of 1978 (42 U.S.C. §7912 and §7942), as amended; and

(E) The normal application of fertilizer.

Sediment - Non-suspended particulate material lying below surface waters such as bays, the ocean, rivers, streams, lakes, ponds, or other similar surface water body (including intermittent streams). Dredged sediments which have been removed from below surface water bodies and placed on land shall be considered soils.

Sensitive environmental areas - Areas that provide unique and often protected habitat for wildlife species. These areas are typically used during critical life stages such as breeding, hatching, rearing of young, and overwintering. Examples include critical habitat for threatened and endangered species, wilderness areas, parks, and wildlife refuges.

Source medium - An environmental medium containing chemicals of concern which must be removed, decontaminated and/or controlled in order to protect human health and the environment. The source medium may be the exposure medium for some exposure pathways.

Stressor - Any physical, chemical, or biological entity that can induce an adverse response; however, as used in this context, only chemical entities apply.

Subsurface soil - For human health exposure pathways, the portion of the soil zone between the base of surface soil and the top of the groundwater-bearing unit(s). For ecological exposure pathways, the portion of the soil zone between 0.5 feet and 5 feet in depth.

Surface cover - A layer of artificially placed utility material (e.g., shell, gravel).

Surface soil - For human health exposure pathways, the soil zone extending from ground surface to 15 feet in depth for residential land use and from ground surface to 5 feet in depth for commercial/industrial land use; or to the top of the uppermost groundwater-bearing unit or bedrock, whichever is less in depth. For ecological exposure pathways, the soil zone extending from ground surface to 0.5 feet in depth.

Surface water - Any water meeting the definition of surface water in the state as defined in §307.3 of this title (relating to Abbreviations and Definitions), as amended.

PART I. Affected Property Identification and Background Information

1) Provide a description of the specific area of the response action and the nature of the release. Include estimated acreage of the affected property and the facility property, and a description of the type of facility and/or operation associated with the affected property. Also describe the location of the affected property with respect to the facility property boundaries and public roadways.

Camp Stanley Storage Activity: CSSA is located in northwestern Bexar County, about 19 miles northwest of downtown San Antonio. The installation consists of approximately 4,004 acres immediately east of Ralph Fair Road, and approximately 0.5 mile east of Interstate Highway 10 (see Figure 1 of the RIR). CSSA has several historical waste sites, including SWMUs, AOCs, and RMUs. The present mission of CSSA is the receipt, storage, issue, and maintenance of ordnance as well as quality assurance testing and maintenance of military weapons and ammunition. Because of its mission, CSSA has been designated a restricted access facility. No changes to the CSSA mission and/or military activities are expected in the future.

AOC-57 is located in the southwest portion of the inner cantonment area of CSSA, east and south-east of Magazines A-100, A-101, and A-102, and is approximately 6.3 acres in size. The site was previously used for storage and maintenance activities at temporary structures.

Attach available USGS topographic maps and/or aerial or other affected property photographs to this form to depict the affected property and surrounding area. Indicate attachments:

- Topo map
- Aerial photo
- Other

Aerial photos of the site and land adjacent to the site are shown on Figure 3 of the RIR. Figures 1 and 2 of the RIR show the general location of AOC-57.

2) Identify environmental media known or suspected to contain chemicals of concern (COCs) at the present time. Check all that apply:

<u>Known/Suspected COC Location</u>	<u>Based on sampling data?</u>	
<input type="checkbox"/> NO – Soil ≤ 5 ft below ground surface	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
<input type="checkbox"/> NO – Soil >5 ft below ground surface	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
<input type="checkbox"/> NO – Groundwater	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
<input type="checkbox"/> NO – Surface Water/Sediments	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No

Explain (previously submitted information may be referenced):

None of the soil sample results showed metal concentrations above the action levels, or the background concentrations when used as the action levels (background values for arsenic, cadmium, lead and mercury were higher than the Tier 1 GWSoilIng PCLs and therefore were used in place of those PCLs). No VOCs or SVOCs were detected in soils above their respective MDLs at AOC-57.

3) Provide the information below for the nearest surface water body which has become or has the potential to become impacted from migrating COCs via surface water runoff, air deposition, groundwater seepage, etc. Exclude wastewater treatment facilities and stormwater conveyances/impoundments authorized by permit. Also exclude conveyances, decorative ponds, and those portions of process facilities which are:

- a. Not in contact with surface waters in the State or other surface waters which are ultimately in contact with surface waters in the State; and
- b. Not consistently or routinely utilized as valuable habitat for natural communities including birds, mammals, reptiles, etc.

The nearest surface water body, **an unnamed tributary that drains to the W-Tank and then to Leon Creek**, is **approximately 50 feet west of AOC-57**. The water body is best described as a:

- freshwater stream: _____ perennial (has water all year)
 _____ intermittent (dries up completely for at least 1 week a year) **[only has water during and immediately after rain events]**
 _____ intermittent with perennial pools
- freshwater swamp/marsh/wetland
- saltwater or brackish marsh/swamp/wetland
- reservoir, lake, or pond; approximate surface acres:
- drainage ditch
- tidal stream bay estuary
- other; specify

Is the water body listed as a State classified segment in Appendix C of the current Texas Surface Water Quality Standards; §§307.1 - 307.10?

- Yes Segment # _____ Use Classification:
 No

If the water body is not a State classified segment, identify the first downstream classified segment.

Name:

Upper Leon Creek

Segment #:

Segment 1907 – from a point 100 meters (330 feet) upstream of State Highway 16 northwest of San Antonio in Bexar County to a point 9.0 kilometers (5.6 miles) upstream of Scenic Loop Road north of Helotes in Bexar County.

Use Classification:

Upper Leon Creek is classified as a perennial stream. The designated uses of Segment 1907 are high aquatic life, contact recreation, public water supply, and aquifer protection. No significant degradation of high quality receiving waters is anticipated from AOC-57.

All creeks at CSSA are intermittent and only have water during and immediately following rain events. Refer to Section 3.2.3 of the RIR.

As necessary, provide further description of surface waters in the vicinity of the affected property:

The closest perennial surface water body to AOC-57 is an unnamed tributary approximately 50 feet west of the site. The tributary drains to the W-Tank, located approximately 1000 feet to the south of AOC-57 (Figure 5 of RIR). The W-tank is located along the westernmost unnamed tributary of Upper Leon Creek. At this point along the unnamed tributary, the distance to Upper Leon Creek is 4,375 feet. The W-tank is fed by precipitation.

The nearest classified creek that is downgradient from AOC-57 is Upper Leon Creek. The creek is classified as a perennial stream. Upper Leon Creek is classified under Texas Surface Water Quality Standards as Segment 1907 from a point 330 feet upstream of State Highway 16 northwest of San Antonio in Bexar County to a point 5.6 miles upstream of Scenic Loop Road north of Helotes in Bexar County. The designated uses of Segment 1907 are high aquatic life, contact recreation, public water

supply, and aquifer protection. No significant degradation of high quality receiving waters is anticipated from AOC-57.

PART II. Exclusion Criteria and Supportive Information

Subpart A. Surface Water/Sediment Exposure

1) Regarding the affected property where a response action is being pursued under the TRRP, have COCs migrated and resulted in a release or imminent threat of release to either surface waters or to their associated sediments via surface water runoff, air deposition, groundwater seepage, etc.? Exclude wastewater treatment facilities and stormwater conveyances/impoundments authorized by permit. Also exclude conveyances, decorative ponds, and those portions of process facilities which are:

- a. Not in contact with surface waters in the State or other surface waters which are ultimately in contact with surface waters in the State; and
- b. Not consistently or routinely utilized as valuable habitat for natural communities including birds, mammals, reptiles, etc.

Yes No

Explain:

Since no contamination was found at AOC-57, there is no impact to groundwater or surface water/sediment in the area. This is supported by the depth to groundwater (33 to 291 feet bgs, depending on rainfall), results of groundwater monitoring at well CC-MW7-LGR, and the distance (50 feet) to the closest surface water body (intermittent tributary to W-tank then to Leon Creek).

If the answer is Yes to Subpart A above, the affected property does not meet the exclusion criteria. However, complete the remainder of Part II to determine if there is a complete and/or significant soil exposure pathway, then complete PART III - Qualitative Summary and Certification. If the answer is No, go to Subpart B.

Subpart B. Affected Property Setting

In answering "Yes" to the following question, it is understood that the affected property is not attractive to wildlife or livestock, including threatened or endangered species (i.e., the affected property does not serve as valuable habitat, foraging area, or refuge for ecological communities). (May require consultation with wildlife management agencies.)

1) Is the affected property wholly contained within contiguous land characterized by: pavement, buildings, landscaped area, functioning cap, roadways, equipment storage area, manufacturing or process area, other surface cover or structure, or otherwise disturbed ground?

Yes No

Explain:

Concentrations of chemicals detected in soil samples at AOC-57 do not exceed Tier 1 residential soil action levels.

There is no evidence of other affected or threatened environmental media (groundwater, surface water, or sediment) at AOC-57. Since soils that were found to have concentrations of metals above their PCLs have been excavated/removed, there will be no impact to groundwater, surface water, or sediment in the area. Inorganic groundwater contamination has not been reported in the closest wells to AOC-57.

Additionally, several surveys have been conducted at CSSA for threatened and endangered (T&E) species. The only T&E species that have been documented at CSSA are the black-capped vireo (*Vireo atricapillus*) [BCVI] and golden-cheeked warbler (*Dendroica chrysoparia*) [GCWA]. AOC-57 is not located within BCVI or GCWA habitat. The nearest potential habitats for local endangered species are approximately 2,933 feet southeast. Additional information can be found in the following references:

- **Parsons, 2007. *Final Integrated Natural Resource Management Plan*. Prepared for Camp Stanley Storage Activity, Boerne, Texas. October 2007. Available online: [CSSA EE \(Volume 1.6, Other Plans and Approaches\)](#)**
- **Parsons, 2009. *Final Species and Habitat Distributions of Black-Capped Vireos and Golden-Cheeked Warblers, 2009 Breeding/Nesting Season*. Prepared for Camp Stanley Storage Activity, Boerne, Texas. September 2009. Available online: [CSSA EE \(Volume 1.6, Other Plans and Approaches\)](#)**

If the answer to Subpart B above is Yes, the affected property meets the exclusion criteria, assuming the answer to Subpart A was No. Skip Subparts C and D and complete PART III - Qualitative Summary and Certification. If the answer to Subpart B above is No, go to Subpart C.

Subpart C. Soil Exposure

1) Are COCs which are in the soil of the affected property solely below the first 5 feet beneath ground surface **or** does the affected property have a physical barrier present to prevent exposure of receptors to COCs in surface soil?

Yes **See explanation** No

Explain:

Based on Table 1 of this RIR there are no COCs at the site.

If the answer to Subpart C above is Yes, the affected property meets the exclusion criteria, assuming the answer to Subpart A was No. Skip Subpart D and complete PART III - Qualitative Summary and Certification. If the answer to Subpart C above is No, proceed to Subpart D.

Subpart D. *De Minimis* Land Area **Subpart D skipped based on answers to Subparts A and B.**

In answering “Yes” to the question below, it is understood that all of the following conditions apply:

- The affected property is not known to serve as habitat, foraging area, or refuge to threatened/endangered or otherwise protected species. (Will likely require consultation with wildlife management agencies.)
- Similar but unimpacted habitat exists within a half-mile radius.
- The affected property is not known to be located within one-quarter mile of sensitive environmental areas (e.g., rookeries, wildlife management areas, preserves). (Will likely require consultation with wildlife management agencies.)
- There is no reason to suspect that the COCs associated with the affected property will migrate such that the affected property will become larger than one acre.

1) Using human health protective concentration levels as a basis to determine the extent of the COCs, does the affected property consist of one acre or less and does it meet all of the conditions above?

Yes No

Explain how conditions are met/not met:

If the answer to Subpart D above is Yes, then no further ecological evaluation is needed at this affected property, assuming the answer to Subpart A was No. Complete PART III - Qualitative Summary and Certification. If the answer to Subpart D above is No, proceed to Tier 2 or 3 or comparable ERA.

PART III. Qualitative Summary and Certification (Complete in all cases).

Attach a brief statement (not to exceed 1 page) summarizing the information you have provided in this form. This summary should include sufficient information to verify that the affected property meets or does not meet the exclusion criteria. The person should make the initial decision regarding the need for further ecological evaluation (i.e., Tier 2 or 3) based upon the results of this checklist. After review, TNRCC will make a final determination on the need for further assessment. **Note that the person has the continuing obligation to re-enter the ERA process if changing circumstances result in the affected property not meeting the Tier 1 exclusion criteria.**

Completed by: Laura Marbury, P.G. (Typed/Printed Name)

Principal Geologist (Title)

May 31, 2011 (Date)

I believe that the information submitted is true, accurate, and complete, to the best of my knowledge.

Julie Burdey, P.G. (Typed/Printed Name of Person)

Project Manager (Title of Person)


 (Signature of Person)

May 31, 2011 (Date Signed)

APPENDIX C
Confirmation Sample Results for All Analytes at AOC-57

Appendix C. Summary of Chemical Constituents Remaining in Soils at AOC-57

Chemicals Tested	CAS Number	Tier 1 Soil PCLs [†]		TCEQ-Approved CSSA Background Metal Concentrations ^{††}	Sample Locations																							
		Source Area 30 acre			AOC57-SS01 12-Jan-2011		AOC57-SS02 12-Jan-2011		AOC57-SS03 12-Jan-2011		AOC57-SS04 12-Jan-2011		AOC57-SS04-Dup 12-Jan-2011		AOC57-SS05 12-Jan-2011		AOC57-SS06 12-Jan-2011		AOC57-SS07 12-Jan-2011		AOC57-SS08 12-Jan-2011		AOC57-SS09 12-Jan-2011		AOC57-SS10 12-Jan-2011			
		Soil mg/kg [1]	Soil mg/kg [2]		Qual	DF	Qual	DF	Qual	DF	Qual	DF	Qual	DF	Qual	DF	Qual	DF	Qual	DF	Qual	DF	Qual	DF	Qual	DF		
Volatiles Organics																												
1,1,1,2-Tetrachloroethane	630-20-6	3.90E+01	c	7.10E-01	c	na		0.0010	U	1	--	--	0.0010	U	1	0.0010	M	1	--	--	0.00090	U	1	--	0.0010	U	1	--
1,1,1-Trichloroethane	71-55-6	3.20E+04	n	8.10E-01	m	na		0.0012	U	1	--	--	0.0012	U	1	0.0012	M	1	--	--	0.0011	U	1	--	0.0011	U	1	--
1,1,2,2-Tetrachloroethane	79-34-5	4.00E+00	c	1.20E-02	c	na		0.0012	U	1	--	--	0.0012	U	1	0.0012	U	1	--	--	0.0011	U	1	--	0.0011	U	1	--
1,1,2-Trichloroethane	79-00-5	1.00E+01	c	1.00E-02	m	na		0.0012	U	1	--	--	0.0012	U	1	0.0012	U	1	--	--	0.0011	U	1	--	0.0011	U	1	--
1,1-Dichloroethane	75-34-3	2.60E+03	n	9.20E+00	n	na		0.0013	U	1	--	--	0.0013	U	1	0.0013	U	1	--	--	0.0012	U	1	--	0.0012	U	1	--
1,1-Dichloroethene	75-35-4	1.60E+03	n	2.50E-02	m	na		0.0014	U	1	--	--	0.0014	U	1	0.0014	U	1	--	--	0.0013	U	1	--	0.0013	U	1	--
1,1-Dichloropropene	563-58-6	2.60E+01	c	6.70E-02	c	na		0.0016	U	1	--	--	0.0016	U	1	0.0015	M	1	--	--	0.0014	U	1	--	0.0015	U	1	--
1,2,3-Trichlorobenzene	87-61-6	1.90E+02	n	1.30E+01	n	na		0.0013	U	1	--	--	0.0013	U	1	0.0013	M	1	--	--	0.0012	U	1	--	0.0012	U	1	--
1,2,3-Trichloropropane	96-18-4	8.70E-01	c	1.10E-03	c	na		0.0010	U	1	--	--	0.0010	U	1	0.0010	U	1	--	--	0.0010	U	1	--	0.0010	U	1	--
1,2,4-Trichlorobenzene	120-82-1	6.10E+02	n	2.40E+00	m	na		0.0013	U	1	--	--	0.0013	U	1	0.0013	M	1	--	--	0.0012	U	1	--	0.0012	U	1	--
1,2,4-Trimethylbenzene	95-63-6	7.30E+01	n	4.90E+00	n	na		0.0014	U	1	--	--	0.0014	U	1	0.0014	M	1	--	--	0.0013	U	1	--	0.0013	U	1	--
1,2-Dibromo-3-chloropropane	96-12-8	8.00E-02	c	8.70E-04	m	na		0.0030	U	1	--	--	0.0030	U	1	0.0030	M	1	--	--	0.0020	U	1	--	0.0020	U	1	--
1,2-Dibromoethane (EDB)	106-93-4	4.30E-01	c	1.00E-04	m	na		0.0017	U	1	--	--	0.0017	U	1	0.0017	U	1	--	--	0.0015	U	1	--	0.0016	U	1	--
1,2-Dichlorobenzene	95-50-1	3.90E+02	n	8.90E+00	m	na		0.0013	U	1	--	--	0.0013	U	1	0.0013	M	1	--	--	0.0012	U	1	--	0.0012	U	1	--
1,2-Dichloroethane	107-06-2	6.40E+00	c	6.90E-03	m	na		0.0013	U	1	--	--	0.0013	U	1	0.0013	U	1	--	--	0.0012	U	1	--	0.0012	U	1	--
1,2-Dichloropropane	78-87-5	3.10E+01	n	1.10E-02	m	na		0.00090	U	1	--	--	0.00090	U	1	0.00090	U	1	--	--	0.00080	U	1	--	0.00080	U	1	--
1,3,5-Trimethylbenzene (Mesitylene)	108-67-8	5.90E+01	n	2.70E+01	n	na		0.0014	U	1	--	--	0.0014	U	1	0.0014	M	1	--	--	0.0013	U	1	--	0.0013	U	1	--
1,3-Dichlorobenzene	541-73-1	6.20E+01	n	3.40E+00	n	na		0.0014	U	1	--	--	0.0014	U	1	0.0014	M	1	--	--	0.0013	U	1	--	0.0013	U	1	--
1,3-Dichloropropane	142-28-9	2.60E+01	c	3.20E-02	c	na		0.00090	U	1	--	--	0.00090	U	1	0.00090	U	1	--	--	0.00080	U	1	--	0.00080	U	1	--
1,4-Dichlorobenzene	106-46-7	2.50E+02	c	1.10E+00	m	na		0.0010	U	1	--	--	0.0010	U	1	0.0010	M	1	--	--	0.00090	U	1	--	0.0010	U	1	--
1-Chlorohexane	544-10-5	2.30E+03	n	2.00E+01	n	na		0.0012	U	1	--	--	0.0012	U	1	0.0012	M	1	--	--	0.0011	U	1	--	0.0011	U	1	--
2,2-Dichloropropane	594-20-7	3.10E+01	n	6.00E-02	c	na		0.0010	U	1	--	--	0.0010	U	1	0.0010	U	1	--	--	0.0010	U	1	--	0.0010	U	1	--
2-Chlorotoluene	95-49-8	8.30E+02	n	4.50E+00	n	na		0.0017	U	1	--	--	0.0017	U	1	0.0017	M	1	--	--	0.0015	U	1	--	0.0016	U	1	--
4-Chlorotoluene	106-43-4	2.50E+00	n	1.90E+01	n	na		0.0014	U	1	--	--	0.0014	U	1	0.0014	M	1	--	--	0.0013	U	1	--	0.0013	U	1	--
Benzene	71-43-2	4.80E+01	c	1.30E-02	m	na		0.0012	U	1	--	--	0.0012	U	1	0.0012	U	1	--	--	0.0011	U	1	--	0.0011	U	1	--
Bromobenzene	108-86-1	7.90E+01	n	2.90E+00	n	na		0.0012	U	1	--	--	0.0012	U	1	0.0012	M	1	--	--	0.0011	U	1	--	0.0011	U	1	--
Bromochloromethane	74-97-5	3.50E+02	n	1.50E+00	n	na		0.0010	U	1	--	--	0.0010	U	1	0.0010	U	1	--	--	0.00090	U	1	--	0.0010	U	1	--
Bromodichloromethane	75-27-4	9.80E+01	c	3.30E-02	c	na		0.0012	U	1	--	--	0.0012	U	1	0.0012	U	1	--	--	0.0011	U	1	--	0.0011	U	1	--
Bromofrom	75-25-2	2.80E+02	c	3.20E-01	c	na		0.0014	U	1	--	--	0.0014	U	1	0.0014	M	1	--	--	0.0013	U	1	--	0.0013	U	1	--
Bromomethane	74-83-9	2.90E+01	n	6.50E-02	n	na		0.00090	U	1	--	--	0.00090	U	1	0.00090	M	1	--	--	0.00080	U	1	--	0.00080	U	1	--
Carbon tetrachloride	56-23-5	9.70E+00	c	3.10E-02	m	na		0.0010	U	1	--	--	0.0010	U	1	0.0010	U	1	--	--	0.0010	U	1	--	0.0010	U	1	--
Chlorobenzene	108-90-7	3.20E+02	n	5.50E-01	m	na		0.00090	U	1	--	--	0.00090	U	1	0.00090	M	1	--	--	0.00080	U	1	--	0.00080	U	1	--
Chloroethane	75-00-3	2.30E+04	n	1.50E+01	n	na		0.0020	U	1	--	--	0.0019	U	1	0.0019	M	1	--	--	0.0018	U	1	--	0.0018	U	1	--
Chloroform	67-66-3	8.00E+00	c	5.10E-01	n	na		0.00090	U	1	--	--	0.00090	U	1	0.00090	U	1	--	--	0.00080	U	1	--	0.00080	U	1	--
Chloromethane	74-87-3	8.40E+01	c	2.00E-01	c	na		0.0020	U	1	--	--	0.0019	U	1	0.0019	M	1	--	--	0.0018	U	1	--	0.0018	U	1	--
cis-1,2-Dichloroethene	156-59-2	7.20E+02	n	1.20E-01	m	na		0.0010	U	1	--	--	0.0010	U	1	0.0010	U	1	--	--	0.00090	U	1	--	0.0010	U	1	--
cis-1,3-Dichloropropene	10061-01-5	7.10E+00	n	3.30E-03	c	na		0.0012	U	1	--	--	0.0012	U	1	0.0012	M	1	--	--	0.0011	U	1	--	0.0011	U	1	--
Dibromochloromethane	124-48-1	7.20E+01	c	2.50E-02	c	na		0.0012	U	1	--	--	0.0012	U	1	0.0012	U	1	--	--	0.0011	U	1	--	0.0011	U	1	--
Dibromomethane	74-95-3	1.40E+02	n	5.60E-01	c	na		0.0010	U	1	--	--	0.0010	U	1	0.0010	U	1	--	--	0.0010	U	1	--	0.0010	U	1	--
Dichlorodifluoromethane	75-71-8	1.20E+04	n	1.20E+02	n	na		0.0023	U	1	--	--	0.0023	U	1	0.0023	M	1	--	--	0.0021	U	1	--	0.0022	U	1	--
Ethylbenzene	100-41-4	4.00E+03	n	3.80E+00	m	na		0.0013	U	1	--	--	0.0013	U	1	0.0013	M	1	--	--	0.0012	U	1	--	0.0012	U	1	--
Hexachlorobutadiene	87-68-3	1.20E+01	c	1.60E+00	c	na		0.0014	U	1	--	--	0.0014	U	1	0.0014	M	1	--	--	0.0013	U	1	--	0.0013	U	1	--
Isopropylbenzene	98-82-8	3.00E+03	n	1.70E+02	n	na		0.0013	U	1	--	--	0.0013	U	1	0.0013	M	1	--	--	0.0012	U	1	--	0.0012	U	1	--
m,p-Xylene	179601-23-1					na		0.0023	U	1	--	--	0.0023	U	1	0.0023	U	1	--	--	0.0021	U	1	--	0.0022	U	1	--
Methylene chloride	75-09-2	2.60E+02	c	6.50E-03	m	na		0.0017	U	1	--	--	0.0017	U	1	0.0017	U	1	--	--	0.0015	U	1	--	0.0016	U	1	--
Naphthalene	91-20-3	1.20E+02	n	1.60E+01	n	na		0.0013	U	1	--	--	0.0013	U	1	0.0013	M	1	--	--	0.0012	U	1	--	0.0012	U	1	--
n-Butylbenzene	104-51-8	1.50E+03	n	6.10E+																								

Appendix C. Summary of Chemical Constituents Remaining in Soils at AOC-57

Chemicals Tested	CAS Number	Tier 1 Soil PCLs [†]		TCEQ-Approved CSSA Background Metal Concentrations ^{††}	Sample Locations																							
		Residential			Source Area 30 acre		AOC57-SS01 12-Jan-2011		AOC57-SS02 12-Jan-2011		AOC57-SS03 12-Jan-2011		AOC57-SS04 12-Jan-2011		AOC57-SS04-Dup 12-Jan-2011		AOC57-SS05 12-Jan-2011		AOC57-SS06 12-Jan-2011		AOC57-SS07 12-Jan-2011		AOC57-SS08 12-Jan-2011		AOC57-SS09 12-Jan-2011		AOC57-SS10 12-Jan-2011	
		Soil mg/kg [1]	Soil mg/kg [2]		mg/kg [3]	Qual	DF	Qual	DF	Qual	DF	Qual	DF	Qual	DF	Qual	DF	Qual	DF	Qual	DF	Qual	DF	Qual	DF	Qual	DF	Qual
3,3'-Dichlorobenzidine	91-94-1	1.00E+01	c	3.10E-02	c	na																						
3-Nitroaniline	99-09-2	1.90E+01	n	1.30E-02	n	na																						
4-Bromophenyl phenyl ether	101-55-3	2.70E-01	c	1.80E-01	c	na																						
4-Chloro-3-methyl phenol	59-50-7	3.30E+02	n	2.30E+00	n	na																						
4-Chloroaniline	106-47-8	2.30E+01	c	1.00E-02	c	na																						
4-Chlorophenyl phenyl ether	7005-72-3	1.50E-01	c	1.60E-02	c	na																						
4-Methylphenol (p-cresol)	106-44-5	2.70E+02	n	3.20E-01	n	na																						
4-Nitroaniline	100-01-6	1.90E+02	n	5.40E-02	c	na																						
4-Nitrophenol	100-02-7	5.10E+01	n	5.00E-02	n	na																						
Acenaphthene	83-32-9	3.00E+03	n	1.20E+02	n	na																						
Acenaphthylene	208-96-8	3.80E+03	n	2.00E+02	n	na																						
Anthracene	120-12-7	1.80E+04	n	3.40E+03	n >S	na																						
Benzo(a)anthracene	56-55-3	5.60E+00	c	8.90E+00	c	na																						
Benzo(a)pyrene	50-32-8	5.60E-01	c	3.80E+00	m	na																						
Benzo(b)fluoranthene	205-99-2	5.70E+00	c	3.40E+01	c	na																						
Benzo(g,h,i)perylene	191-24-2	1.80E+03	n	2.30E+04	n >S	na																						
Benzoic acid	65-85-0	3.50E+02	n	9.50E+01	n	na																						
Benzyl alcohol	100-51-6	4.00E+03	n	1.50E+01	n	na																						
Benzyl butyl phthalate	85-68-7	1.60E+03	c	1.30E+02	c	na																						
bis(2-Chloroethoxy)methane	111-91-1	2.50E+00	c	5.90E-03	c	na																						
bis(2-chloroethyl)ether	111-44-4	1.40E+00	c	1.10E-03	c	na																						
bis(2-chloroisopropyl)ether	108-60-1	4.10E+01	c	9.50E-02	c	na																						
bis(2-Ethylhexyl) phthalate	117-81-7	4.30E+01	c	8.20E+01	m	na																						
Chrysene	218-01-9	5.60E+02	c	7.70E+02	c >S	na																						
Dibenzo(a,h)anthracene	53-70-3	5.50E-01	c	7.60E+00	c	na																						
Dibenzofuran	132-64-9	2.70E+02	n	1.70E+01	n	na																						
Diethyl phthalate	84-66-2	1.40E+03	n	7.80E+01	n	na																						
Dimethyl phthalate	131-11-3	6.60E+02	n	3.10E+01	n	na																						
Di-n-butyl phthalate	84-74-2	4.40E+03	n	1.70E+03	n	na																						
Di-n-octyl phthalate	117-84-0	1.30E+03	n	8.10E+05	n >S	na																						
Fluoranthene	206-44-0	2.30E+03	n	9.60E+02	n >S	na																						
Fluorene	86-73-7	2.30E+03	n	1.50E+02	n	na																						
Hexachlorobenzene	118-74-1	1.00E+00	c	5.60E-01	m	na																						
Hexachlorobutadiene	87-68-3	1.20E+01	c	1.60E+00	c	na																						
Hexachlorocyclopentadiene	77-47-4	7.20E+00	n	9.60E+00	m	na																						
Hexachloroethane	67-72-1	6.70E+01	n	9.20E-01	n	na																						
Indeno(1,2,3-cd)pyrene	193-39-5	5.70E+00	c	8.70E+01	c	na																						
Isophorone	78-59-1	1.20E+03	n	1.50E+00	c	na																						
Naphthalene	91-20-3	1.20E+02	n	1.60E+01	n	na																						
Nitrobenzene	98-95-3	3.40E+01	c	1.80E-01	n	na																						
n-Nitrosodi-n-propylamine	621-64-7	4.00E-01	c	1.80E-04	c	na																						
n-Nitrosodiphenylamine	86-30-6	5.70E+02	c	1.40E+00	c	na																						
Pentachlorophenol	87-86-5	2.40E+00	c	9.20E-03	m	na																						
Phenanthrene	85-01-8	1.70E+03	n	2.10E+02	n	na																						
Phenol	108-95-2	1.60E+03	n	9.60E+00	n	na																						
Pyrene	129-00-0	1.70E+03	n	5.60E+02	n >S	na																						
Inorganic Metals																												
Arsenic	7440-38-2	2.40E+01	n	2.5	m >S	19.6																						
Barium	7440-39-3	7.80E+03	n	221.9	m >S	186																						
Cadmium	7440-43-9	5.20E+01	n	0.8	m >S	3.0																						
Chromium	7440-47-3	2.30E+04	n	1200.1	m >S	40.2																						
Copper	7440-50-8	5.50E+02	n	521.2	a >S	23.2																						
Lead	7439-92-1	5.00E+02	n	1.5	a >S	84.5																						
Mercury	7439-97-6	2.10E+00	n	0.0	m	0.8																						
Nickel	7440-02-0	8.30E+02	n	78.7	n >S	35.50																						
Zinc	7440-66-6	9.90E+03	n	1180.2	n >S	73.2																						

NOTES:

† TCEQ, TRRP Tier 1 Soil PCLs (Last Revised: March 25, 2009)
 †† CSSA Soil Background Concentrations. Second Revision, Evaluation of Background Metals Concentrations in Soils and Bedrock at CSSA. February 2002. Values from Table 3.3
 PCLs and CSSA background values coded in this table as [1, 2, 3].

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

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

[3] CSSA Soil Background Concentrations.

PCLs for detected compounds 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.
 na = not applicable.

QA NOTES AND DATA QUALIFIERS:

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)

J - Analyte was positively identified but the associated concentration is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria

Values shown in BOLD indicate detections above the MDL.

APPENDIX D

Data Verification Summary Report

(Includes AOC-57, AOC-59, and AOC-70)

DATA VERIFICATION SUMMARY REPORT
for samples collected from AOCs 57, 59, and 70 at
CAMP STANLEY STORAGE ACTIVITY
BOERNE, TEXAS

Data Verification by: Tammy Chang
Parsons - Austin

INTRODUCTION

The following data verification summary report covers soil samples and associated field quality control (QC) water samples collected from Camp Stanley Storage Activity (CSSA) under BRAC 50 on January 12, 2011. The samples in the following Sample Delivery Group (SDG) were analyzed for pesticides, herbicides, volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), explosives, and metals:

63657

Not all samples were analyzed for all parameters. Field QC samples collected in association with this SDG included (1) two trip blanks for VOCs; (2) two equipment blank for all above listed parameters; (3) three pairs of parent and field duplicate (FD) samples for all above listed parameters; and (4) three sets of matrix spike/matrix spike duplicate (MS/MSD).

All samples were collected by Parsons and analyzed by Agriculture & Priority Pollutants Laboratories, Inc. (APPL) in Clovis, California, following the procedures outlined in the Statement of Work and CSSA QAPP, Version 1.0.

The samples in this SDG were shipped to the laboratory in two coolers. Those coolers were received by the laboratory at a temperature of 2.5°C and 1.5°C. The recommended range is 2-6°C. One cooler was received 0.5°C below the recommended range, this small non-compliant exceedance should not affect data quality of this SDG.

EVALUATION CRITERIA

The data submitted by the laboratory has been reviewed and verified following the guidelines outlined in the CSSA QAPP, Version 1.0. Information reviewed in the data packages included sample results; field and laboratory quality control results; calibrations; case narratives; raw data; COC forms and the cooler receipt checklist. The analyses and findings presented in this report are based on the reviewed information, and whether guidelines in the CSSA QAPP, Version 1.0, were met.

ICP METALS

General

The inductively coupled plasma (ICP) metals portion of this SDG consisted of twenty (20) soil samples and two (2) EBs. The samples were collected on January 12, 2011 and were

analyzed for arsenic, barium, cadmium, chromium, copper, lead, nickel and zinc. Not all samples were run for the full list of metals.

The ICP metals analyses were performed using USEPA SW846 Method 6010B. All samples in this SDG were analyzed following the procedures outlined in the CSSA QAPP. All samples were prepared and analyzed within the holding time required by the method.

The ICP metals samples were digested in four batches, two for soil and two for water.

Accuracy

Accuracy was evaluated using the percent recovery obtained from the four laboratory control samples (LCS), one for each analytical batch and two sets of MS/MSD, AOC57-SS04FD and AOC59-SS03.

All LCS recoveries were within acceptance criteria for both LCSs.

All %Rs of metal failed to meet the 80 – 120% criteria in MS and/or MSD analyses of both sets of MS/MSD. “M” flags were applied to all metal results of parent samples.

Precision

Precision was evaluated with the relative percent difference (%RPD) of the two sets of parent and FD samples and two sets of MS/MSD. %RPD calculation is only applicable when both results are greater than reporting limit (RL).

All %RPD of both sets of MS/MSD were compliant

AOC57-SS04

Metals	Parent, mg/kg	FD, mg/kg	%RPD	Criteria, %RPD
Barium	40.2	39.7	1.3	≤ 20
Copper	4.65	4.99	7.1	
Nickel	6.64	7.37	10	
Zinc	16.2	18.2	12	

AOC59-SS01

Metals	Parent, mg/kg	FD, mg/kg	%RPD	Criteria, %RPD
Barium	44.5	44.6	0.2	≤ 20
Copper	10.05	10.71	6.4	
Lead	32.78	34.23	4.3	
Nickel	9.38	9.26	1.3	
Zinc	20.7	24.7	18	

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the CSSA QAPP;

- Comparing actual analytical procedures to those described in the CSSA QAPP;
- Evaluating holding times; and
- Examining laboratory blanks and equipment blanks (EBs) for cross contamination of samples during collection and analysis.

The samples in this SDG were analyzed following the COC and the analytical procedures described in the CSSA QAPP. All samples were prepared and analyzed within the holding times required by the method.

- All instrument tune criteria were met.
- All initial calibration criteria were met.
- All calibration verification criteria were met.
- All second source verification criteria were met. The initial calibration verification (ICV) was prepared using a secondary source.
- All interference check criteria were met.
- All internal standard criteria were met.
- Dilution test (DT) was analyzed on sample AOC57-SS04FD. The DT was applicable for all metals detected in the parent sample at a concentration of 50 times the MDL or greater. All applicable metals failed to meet criteria in the DT, as follows:

AOC57-SS04FD

Metal	%D	Criteria
Barium	123	%D ≤ 10
Chromium	53	
Nickel	60	

- A post digestion spike (PDS) was analyzed on the same samples as the DT. All metals met criteria in the PDS:

AOC57-SS04FD

Metal	%R	Criteria
Arsenic	86	75-125%
Barium	114	
Cadmium	79	
Chromium	87	
Copper	92	
Nickel	84	
Lead	80	
Zinc	82	

There were four method blanks (MBs), two EBs and several calibration blanks associated with the ICP analyses in this SDG. All blanks were free of any target metals at or above the RL.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

All ICP results for the samples in this SDG were considered usable. The completeness for the ICP portion of this SDG is 100%, which meets the minimum acceptance criteria of 90%.

MERCURY

General

The mercury portion of this SDG consisted of twenty (20) soil samples and two (2) EB. The samples were collected on January 12, 2011 and were analyzed for mercury.

The mercury analyses were performed using USEPA SW846 Method 7471A/7470A. All samples in this SDG were analyzed following the procedures outlined in the CSSA QAPP. All samples were prepared and analyzed within the holding time required by the method.

The mercury samples were prepared in two analytical batches, one for soil and one for EB.

Accuracy

Accuracy was evaluated using the percent recovery obtained from the two LCSs.

Both LCS recoveries were within acceptance criteria.

Precision

Precision was evaluated with the %RPD of the two sets of parent and FD samples and two sets of MS/MSD. %RPD calculation is only applicable when both results are greater than RL.

Since both sets of parent and FD samples had no detection of mercury at RL, the %RPD calculation was not applicable.

Both %RPDs of the two sets of MS/MSD were compliant.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the CSSA QAPP;
- Comparing actual analytical procedures to those described in the CSSA QAPP;
- Evaluating holding times; and
- Examining laboratory blanks and EBs for cross contamination of samples during sample collection and analysis.

The samples in this SDG were analyzed following the COC and the analytical procedures described in the CSSA QAPP. All samples were prepared and analyzed within the holding times required by the method.

- All initial calibration criteria were met.

- All calibration verification criteria were met.
- All second source verification criteria were met. The ICV was prepared using a secondary source.

There were two MBs, one EB, and several calibration blanks associated with the mercury analyses in this SDG. All blanks were free of mercury at or above the RL.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

All mercury results for the samples in this SDG were considered usable. The completeness for the mercury portion of this SDG is 100%, which meets the minimum acceptance criteria of 90%.

PESTICIDES

General

The pesticide portion of this SDG consisted of seven (7) soil samples and one (1) EB. The samples were collected on January 12, 2011 and were analyzed for pesticides.

The pesticides analyses were performed using USEPA SW846 Method 8081. All samples in this SDG were analyzed following the procedures outlined in the CSSA QAPP. All samples were prepared and analyzed within the holding time required by the method.

The pesticide samples were prepared in two analytical batches, one for each matrix.

Accuracy

Accuracy was evaluated using the percent recovery obtained from the two LCSs, one set of MS/MSD, and surrogates.

All LCSs and surrogates recoveries were within acceptance criteria for both analytical batches.

The non-compliant %Rs of the MS/MSD are listed below:

AOC70-SS02

Compound	MS, %R	MSD, %R	Control Limits, %R
4,4-DDE	462	(102)	68 – 126
4,4-DDT	156	(95)	46 - 135

() indicates the %R was compliant.

“M” flag was applied to the parent sample result of these two compounds.

Precision

Precision was evaluated with the %RPD of the one set of parent and FD samples and MS/MSD results. %RPD calculation is only applicable when both results are greater than RL.

Since none of the target compounds were detected at or greater than RL, %RPD calculation was not applicable.

All %RPDs of MS/MSD were compliant.

The only compound with detected concentration greater than RL is 4,4-DDT in sample AOC70-SS04 and its FD:

Compound	Parent, mg/kg	FD, mg/kg	%RPD	Criteria, %RPD
4,4-DDE	0.0091	0.0121	28	≤50
4,4-DDT	0.0093	0.0096	3.2	

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the CSSA QAPP;
- Comparing actual analytical procedures to those described in the CSSA QAPP;
- Evaluating holding times; and
- Examining laboratory blank and EB for cross contamination of samples during collection and analysis.

The samples in this SDG were analyzed following the COC and the analytical procedures described in the CSSA QAPP. All samples were prepared and analyzed within the holding times required by the method.

- All initial calibration criteria were met.
- All calibration verification criteria were met.
- All second source verification criteria were met. The ICV was prepared using a secondary source.
- The %RPD of 4,4-DDE detected in the sample AOC70-SS04 and its FD is >40%, lab applied “J” to the sample result according to the CSSA QAPP.

There were two MBs, two EBs, and several calibration blanks associated with the pesticides analyses in this SDG. All blanks were free of pesticides at or above the RL.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

All pesticides results for the samples in this SDG were considered usable. The completeness for the pesticides portion of this SDG is 100%, which meets the minimum acceptance criteria of 90%.

HERBICIDES

General

The herbicides portion of this SDG consisted of seven (7) soil samples and one (1) EB. The samples were collected on January 12, 2011 and were analyzed for herbicides.

The herbicides analyses were performed using USEPA SW846 Method 8151A. All samples in this SDG were analyzed following the procedures outlined in the CSSA QAPP. All samples were prepared and analyzed within the holding time required by the method.

The herbicide samples were prepared in two analytical batches, one for each matrix.

Accuracy

Accuracy was evaluated using the percent recovery obtained from the two LCSs, MS, MSD, and surrogate.

Both LCSs and surrogate recoveries were within acceptance criteria.

The non-compliant %Rs of the MS/MSD are listed below:

AOC70-SS02

Compounds	MS, %R	MSD, %R	Control Limits, %R
Dalapon	2.7	2.0	22 - 125
Dicamba	6.7	6.7	56 - 120
MCPA	52	57	65 - 120

“M” flag was applied to the parent sample result of the above compounds.

Precision

Precision was evaluated with the %RPD of the one set of parent and FD samples and MS/MSD results. %RPD calculation is only applicable when both results are greater than RL.

Since none of the target compounds were detected at or greater than RL, %RPD calculation was not applicable.

All %RPDs of MS/MSD were compliant.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the CSSA QAPP;
- Comparing actual analytical procedures to those described in the CSSA QAPP;
- Evaluating holding times; and
- Examining laboratory blanks and EB for cross contamination of samples during sample collection and analysis.

The samples in this SDG were analyzed following the COC and the analytical procedures described in the CSSA QAPP. All samples were prepared and analyzed within the holding times required by the method.

- All initial calibration criteria were met.
- All calibration verification criteria were met.
- All second source verification criteria were met. The ICV was prepared using a secondary source.

There were two MBs, one EB, and several calibration blanks associated with the herbicides analyses in this SDG. All blanks were free of herbicides at or above the RL.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

All herbicides results for the samples in this SDG were considered usable. The completeness for the herbicides portion of this SDG is 100%, which meets the minimum acceptance criteria of 90%.

VOLATILES

General

This data package consisted of seven (7) soil samples, one (1) TB, and one (1) EB. The samples were collected on January 12, 2011 and were analyzed for a full list of VOCs.

The VOC analyses were performed using United States Environmental Protection Agency (USEPA) SW846 Method 8260B. The samples were analyzed in three analytical batches under two separate initial calibration (ICAL) curves, one for soil, one for TB and one for EB. All samples were analyzed following the procedures outlined in the CSSA QAPP. All samples were prepared and analyzed within the holding time required by the method. All samples were analyzed undiluted. EB and TB were run with the same set of ICAL.

Accuracy

Accuracy was evaluated using the percent recovery (%R) obtained from the three LCSs, MS, MSD, and the surrogate spikes.

All LCSs and surrogate spike recoveries were within acceptance criteria for all three batches.

There were numerous non-compliant %Rs in the MS/MSD. "M" flags were applied.

Precision

Precision was evaluated with the %RPD of the one set of parent and FD samples. %RPD calculation is only applicable when both results are greater than RL.

Since none of the target compounds were detected at or greater than RL in the parent sample, AOC57-SS04 and its FD, %RPD calculation was not applicable.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the CSSA QAPP;
- Comparing actual analytical procedures to those described in the CSSA QAPP;
- Evaluating holding times; and
- Examining TB, EB, and laboratory blanks for cross contamination of samples during collection, transit or analysis.

All samples in this data package were analyzed following the COC and the analytical procedures described in the CSSA QAPP, Version 1.0. All samples were prepared and analyzed within the holding time required by the method.

- All instrument performance check criteria were met.
- All initial calibration criteria were met.
- All three LCS samples were prepared with a secondary source. All second source verification criteria were met.
- All ICV criteria were met.
- All continuing calibration verification (CCV) criteria were met.
- All internal standard criteria were met.

There were three MBs, one EB, one TB, and few calibration blanks associated with the VOC analyses in this SDG. All blanks were non-detect for all target VOCs.

Completeness

Completeness has been evaluated in accordance with the CSSA QAPP. The number of usable results has been divided by the number of possible individual analyte results and expressed as a percentage to determine the completeness of the data set.

All VOC results for the samples in this SDG were considered usable. The completeness for this SDG is 100%, which meets the minimum acceptance criteria of 95%.

SEMI-VOLATILES

General

This data package consisted of seven (7) soil samples and one (1) EB. The samples were collected on January 12, 2011 and were analyzed for a full list of SVOCs.

The SVOC analyses were performed using United States Environmental Protection Agency (USEPA) SW846 Method 8270C. The samples were analyzed in two analytical batches under two separate initial calibration (ICAL) curves, one for each matrix. All samples were analyzed following the procedures outlined in the CSSA QAPP. All samples were prepared and analyzed within the holding time required by the method. All samples were analyzed undiluted.

Accuracy

Accuracy was evaluated using the %R obtained from the two LCSs, MS, MSD, and the surrogate spikes.

All LCSs and surrogate spike recoveries were within acceptance criteria for both batches.

The non-compliant %Rs of the MS/MSD are listed below:

AOC57-SS04FD

Compound	MS, %R	MSD, %R	Control Limits, %R
2,4-Dimethylphenol	(36)	29	35 – 149
Benzoic Acid	2.4	1.8	25 - 172

() indicates the %R was compliant.

“M” flag was applied to the parent sample result of these two compounds.

Precision

Precision was evaluated with the %RPD of the one set of parent and FD samples and MS/MSD results. %RPD calculation is only applicable when both results are greater than RL.

Since none of the target compounds were detected at or greater than RL in the parent, AOC57-SS04 and its FD, %RPD calculation was not applicable.

All %RPDs of MS/MSD were compliant.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the CSSA QAPP;
- Comparing actual analytical procedures to those described in the CSSA QAPP;
- Evaluating holding times; and
- Examining EB and laboratory blanks for cross contamination of samples during collection or analysis.

All samples in this data package were analyzed following the COC and the analytical procedures described in the CSSA QAPP, Version 1.0. All samples were prepared and analyzed within the holding time required by the method.

- All instrument performance check criteria were met.
- All initial calibration criteria were met.
- Both LCS samples were prepared with a secondary source. All second source verification criteria were met.
- All ICV criteria were met.
- All CCV criteria were met.

- All internal standard criteria were met.

There were two MBs, one EB, and few calibration blanks associated with the SVOC analyses in this SDG. All blanks were non-detect for all target SVOCs.

Completeness

Completeness has been evaluated in accordance with the CSSA QAPP. The number of usable results has been divided by the number of possible individual analyte results and expressed as a percentage to determine the completeness of the data set.

All SVOC results for the samples in this SDG were considered usable. The completeness for this SDG is 100%, which meets the minimum acceptance criteria of 95%.

EXPLOSIVES

General

This data package consisted of seven (7) soil samples and one (1) EB. The samples were collected on January 12, 2011 and were analyzed for a full list of explosives by SW8330B.

The explosive analyses were performed using USEPA SW846 Method 8330B. The samples were analyzed in two analytical batches under two separate sets of ICAL curves, one for each matrix. All samples were analyzed following the procedures outlined in the CSSA QAPP. All samples were prepared and analyzed within the holding time required by the method. All samples were analyzed undiluted.

Accuracy

Accuracy was evaluated using the %R obtained from the two LCSs, MS, MSD, and the surrogate spikes. MS/MSD were performed with sample AOC59-SS03.

All LCSs, MS, MSD, and surrogate spike recoveries were within acceptance criteria for both batches.

Precision

Precision was evaluated with the %RPD of the one set of parent and FD samples and MS/MSD results. %RPD calculation is only applicable when both results are greater than RL.

Since none of the target compounds were detected at or greater than RL in the parent, AOC59-SS01 and its FD, %RPD calculation was not applicable.

All %RPDs of MS/MSD were compliant.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the CSSA QAPP;
- Comparing actual analytical procedures to those described in the CSSA QAPP;

- Evaluating holding times; and
- Examining EB and laboratory blanks for cross contamination of samples during collection or analysis.

All samples in this data package were analyzed following the COC and the analytical procedures described in the CSSA QAPP, Version 1.0. All samples were prepared and analyzed within the holding time required by the method.

- All instrument performance check criteria were met.
- All initial calibration criteria were met.
- Both LCS samples were prepared with a secondary source. All second source verification criteria were met.
- All ICV criteria were met.
- All CCV criteria were met.

There were two MBs, one EB, and few calibration blanks associated with the explosive analyses in this SDG. All blanks were non-detect for all target explosives.

Completeness

Completeness has been evaluated in accordance with the CSSA QAPP. The number of usable results has been divided by the number of possible individual analyte results and expressed as a percentage to determine the completeness of the data set.

All explosive results for the samples in this SDG were considered usable. The completeness for this SDG is 100%, which meets the minimum acceptance criteria of 95%.

APPENDIX E

Area of Concern 57 Soil Gas Sampling Results, January - February 2001

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Area of Concern 57

Soil Gas Survey Results, January - February 2001

Introduction

A soil gas survey was performed at AOC 57 located in the southwestern portion of CSSA. This report contains a summary of the analytical results from the AOC 57 soil gas survey. A detailed description of the methodology is included behind the [Soil Gas Surveys](#) tab in [Volume 3-1.1](#). This work was performed in conjunction with soil gas surveys performed at SWMU B-3, SWMU B-4, AOC 55, AOC 63, AOC 65 and the WWTP from January 2, 2001 through February 23, 2001.

The distribution and concentrations for the compounds detected are addressed below. Minor amounts of benzene, toluene, and xylene were detected in soil gas samples throughout the soil gas survey. The detection of these compounds is attributed to artifact contamination from the gas generator used to power the vacuum pump and/or the combustion engine of the geoprobe truck. The frequency of detectable BTEX compounds decreased substantially after the gas generator was moved to the front of the geoprobe rig, and the rig was shut down during sample collection. The BTEX concentrations detected during the soil gas survey are presented in the data tables, but are not discussed in the soil gas findings. The complete laboratory results are presented in [Appendix A](#). Sample locations are presented in the AOC 57 Sample Location Map, [Figure AOC 57-1](#).

Determination of Sampling Locations

Grid locations at AOC 57 were set up based on historical maps that showed locations of temporary buildings in this area. A soil gas survey was performed to confirm that no VOC contamination existed in the vicinity of these buildings, which were reportedly used for gun cleaning and maintenance operations. One hundred twenty-nine (129) grid points were established in 100-foot intervals, which provided adequate coverage of the historical building location areas identified on the aerial photographs. The survey grid would have been tightened to 25-foot grids if any areas indicated contamination.

AOC 57 is long and narrow and extends approximately 4,000 feet from south to north along a 65-acre area. Because the locations of the buildings and topography did lie along a straight-line path, the AOC 57 grid was set up as a

3-part grid (designated North, Central, and South grids) to enable the grid points to provide adequate coverage and consistent spacing within each grid area around the former building locations. The layout of this grid is shown on [Figure AOC57-1](#).

Soil Gas Survey Results

AOC 57 North

A total of 38 samples and two resamples were collected at AOC 57 North. The sampling locations are shown on [Figure AOC57-1](#). Sampling depths varied from 0.5 to 4.5 feet and depended on refusal. The field team did not observe disturbed soil that would be associated with a landfill environment or concrete footings that would suggest the presence of old buildings. Laboratory-detected constituents are provided in Table 3.1. Plume maps for this AOC are not included because target VOC compounds were not detected.

AOC 57 Central

A total of 67 samples were collected in the AOC 57 Central area. The sampling locations are shown on [Figure AOC57-1](#). Sampling depths ranged from 0.5 to 4.5 feet and depended on refusal. The field team did not observe disturbed soil that would be associated with a landfill environment or concrete footings that would suggest the presence of old buildings. PCE was the only contaminant detected in this portion of the grid, and was reported at a low level in sample location AOC57C-65. This point is located directly east of Building 90 just across the road and is presented on the contour maps associated with the discussion of the AOC 65 results ([Volume 3-2, Areas of Concern, AOC 65](#) site tab). Detected constituents are provided in [Table AOC57-1](#).

AOC 57 South

Twenty-two samples were collected at AOC 57 South. The sampling locations are shown on [Figure AOC57-1](#). Sampling depths ranged from 0.5 to 5 feet and depended on refusal. The field team did not observe disturbed soil that would be associated with a landfill environment. However, building pads associated with temporary structures were visible in the vicinity west of Building 92. Detected constituents are provided in [Table AOC57-1](#). No figure is included in this section depicting the plume maps because target VOC compounds were not detected at this AOC.

Summary of Findings and Recommendations

From the soil gas survey results, it appears that no significant VOC contamination has been released to, or is present in, the soil and groundwater underlying AOC 57. No additional investigation activities are proposed at AOC 57 with regard to VOC contamination.

Table AOC 57.1 - North Detected Constituents

Sample ID	Sample Date	Benzene	DCE, cis-1,2-	DCE, trans-1,2-	Ethylbenzene	PCE	Toluene	TCE	Vinyl chloride	Xylene, m,p-	Xylene, o-
	MDL	0.02	0.03	0.04	0.06	0.07	0.04	0.03	0.09	0.06	0.06
	RL	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.51	0.20	0.20
AOC57-1	01/03/01	~ 0.09	< 0.03	< 0.04	< 0.06	< 0.07	= 0.55	< 0.03	< 0.09	~ 0.09	< 0.06
AOC57-1R	01/04/01	< 0.02	< 0.03	< 0.04	< 0.06	< 0.07	= 0.06	< 0.03	< 0.09	< 0.06	< 0.06
AOC57-2	01/03/01	~ 0.17	< 0.03	< 0.04	< 0.06	< 0.07	= 1.31	< 0.03	< 0.09	~ 0.17	~ 0.07
AOC57-2R	01/04/01	< 0.02	< 0.03	< 0.04	< 0.06	< 0.07	= 0.07	< 0.03	< 0.09	< 0.06	< 0.06
AOC57-3	01/03/01	< 0.02	< 0.03	< 0.04	< 0.06	< 0.07	~ 0.11	< 0.03	< 0.09	< 0.06	< 0.06
AOC57-4	01/03/01	~ 0.02	< 0.03	< 0.04	< 0.06	< 0.07	~ 0.18	< 0.03	< 0.09	< 0.06	< 0.06
AOC57-5	01/04/01	< 0.02	< 0.03	< 0.04	< 0.06	< 0.07	= 0.07	< 0.03	< 0.09	< 0.06	< 0.06
AOC57-6	01/04/01	< 0.02	< 0.03	< 0.04	< 0.06	< 0.07	= 0.11	< 0.03	< 0.09	< 0.06	< 0.06
AOC57-7	01/04/01	= 0.03	< 0.03	< 0.04	< 0.06	< 0.07	= 0.09	< 0.03	< 0.09	< 0.06	< 0.06
AOC57-8	01/03/01	< 0.02	< 0.03	< 0.04	< 0.06	< 0.07	~ 0.12	< 0.03	< 0.09	< 0.06	< 0.06
AOC57-9	01/04/01	= 0.02	< 0.03	< 0.04	< 0.06	< 0.07	= 0.22	< 0.03	< 0.09	< 0.06	< 0.06
AOC57-10	01/04/01	< 0.02	< 0.03	< 0.04	< 0.06	< 0.07	= 0.07	< 0.03	< 0.09	< 0.06	< 0.06
AOC57-11	01/04/01	< 0.02	< 0.03	< 0.04	< 0.06	< 0.07	= 0.07	< 0.03	< 0.09	< 0.06	< 0.06
AOC57-12	01/04/01	< 0.02	< 0.03	< 0.04	< 0.06	< 0.07	= 0.07	< 0.03	< 0.09	< 0.06	< 0.06
AOC57-13	01/04/01	= 0.03	< 0.03	< 0.04	< 0.06	< 0.07	= 0.51	< 0.03	< 0.09	< 0.06	< 0.06
AOC57-14	01/04/01	< 0.02	< 0.03	< 0.04	< 0.06	< 0.07	= 0.07	< 0.03	< 0.09	< 0.06	< 0.06
AOC57-15	01/04/01	< 0.02	< 0.03	< 0.04	< 0.06	< 0.07	= 0.19	< 0.03	< 0.09	< 0.06	< 0.06
AOC57-16	01/04/01	< 0.02	< 0.03	< 0.04	< 0.06	< 0.07	= 0.09	< 0.03	< 0.09	< 0.06	< 0.06
AOC57-17	01/04/01	< 0.02	< 0.03	< 0.04	< 0.06	< 0.07	= 0.09	< 0.03	< 0.09	< 0.06	< 0.06
AOC57-18	01/04/01	= 0.02	< 0.03	< 0.04	< 0.06	< 0.07	= 0.1	< 0.03	< 0.09	< 0.06	< 0.06
AOC57-19	01/04/01	= 0.03	< 0.03	< 0.04	< 0.06	< 0.07	= 0.1	< 0.03	< 0.09	< 0.06	< 0.06
AOC57-20	01/04/01	< 0.02	< 0.03	< 0.04	< 0.06	< 0.07	= 0.05	< 0.03	< 0.09	< 0.06	< 0.06
AOC57-21	01/05/01	= 0.05	< 0.03	< 0.04	< 0.06	< 0.07	= 0.11	< 0.03	< 0.09	< 0.06	< 0.06
AOC57-22	01/05/01	= 0.11	< 0.03	< 0.04	< 0.06	< 0.07	= 0.22	< 0.03	< 0.09	~ 0.08	< 0.06
AOC57-23	01/05/01	< 0.02	< 0.03	< 0.04	< 0.06	< 0.07	= 0.06	< 0.03	< 0.09	< 0.06	< 0.06
AOC57-25	01/05/01	< 0.02	< 0.03	< 0.04	< 0.06	< 0.07	= 0.08	< 0.03	< 0.09	< 0.06	< 0.06
AOC57-26	01/05/01	= 0.11	< 0.03	< 0.04	< 0.06	< 0.07	= 0.28	< 0.03	< 0.09	< 0.06	< 0.06
AOC57-27	01/05/01	< 0.02	< 0.03	< 0.04	< 0.06	< 0.07	= 0.07	< 0.03	< 0.09	< 0.06	< 0.06
AOC57-30	01/05/01	< 0.02	< 0.03	< 0.04	< 0.06	< 0.07	= 0.04	< 0.03	< 0.09	< 0.06	< 0.06
AOC57-31	01/05/01	< 0.02	< 0.03	< 0.04	< 0.06	< 0.07	= 0.08	< 0.03	< 0.09	< 0.06	< 0.06
AOC57-32	01/05/01	< 0.02	< 0.03	< 0.04	< 0.06	< 0.07	= 0.05	< 0.03	< 0.09	< 0.06	< 0.06
AOC57-34	01/05/01	= 0.02	< 0.03	< 0.04	< 0.06	< 0.07	= 0.12	< 0.03	< 0.09	< 0.06	< 0.06
AOC57-35	01/05/01	< 0.02	< 0.03	< 0.04	< 0.06	< 0.07	= 0.04	< 0.03	< 0.09	< 0.06	< 0.06
AOC57-36	01/05/01	< 0.02	< 0.03	< 0.04	< 0.06	< 0.07	= 0.07	< 0.03	< 0.09	< 0.06	< 0.06
AOC57-38	01/05/01	< 0.02	< 0.03	< 0.04	< 0.06	< 0.07	= 0.06	< 0.03	< 0.09	< 0.06	< 0.06
AOC57-39	01/05/01	< 0.02	< 0.03	< 0.04	< 0.06	< 0.07	= 0.06	< 0.03	< 0.09	< 0.06	< 0.06
AOC57-40	01/05/01	< 0.02	< 0.03	< 0.04	< 0.06	< 0.07	= 0.1	< 0.03	< 0.09	< 0.06	< 0.06
AOC57-42	01/05/01	= 0.06	< 0.03	< 0.04	< 0.06	< 0.07	= 0.17	< 0.03	< 0.09	< 0.06	< 0.06
AOC57-43	01/05/01	< 0.02	< 0.03	< 0.04	< 0.06	< 0.07	= 0.04	< 0.03	< 0.09	< 0.06	< 0.06
AOC57-44	01/05/01	= 0.05	< 0.03	< 0.04	< 0.06	< 0.07	= 0.2	< 0.03	< 0.09	< 0.06	< 0.06

Notes:

BTEX detections are attributed to geoprobe rig and gas generator exhaust.
 In the soil comparison criteria, the lab MDL and RL are based on a Dilution Factor of 1.
 All results are based on a dilution factor of 1 unless otherwise noted in parenthesis below result value.
 All samples with detections above the MDL are highlighted.
 All samples with a J flag are in bold.
 All samples are reported in UG/L

Acronyms and Abbreviations:

MDL Method Detection Limit
 RL Reporting Limit

Table AOC 57.1 - Central Detected Constituents

Sample ID	Sample Date	Benzene	DCE, cis-1,2-	DCE, trans-1,2-	Ethylbenzene	PCE	Toluene	TCE	Vinyl chloride	Xylene, m,p-	Xylene, o
	MDL	0.02	0.03	0.04	0.06	0.07	0.04	0.03	0.09	0.06	0.06
	RL	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.51	0.20	0.20
AOC57C-2	01/06/01	< 0.02	< 0.03	< 0.04	< 0.06	< 0.07	= 0.08	< 0.03	< 0.09	< 0.06	< 0.06
AOC57C-3	01/07/01	< 0.02	< 0.03	< 0.04	< 0.06	< 0.07	= 0.05	< 0.03	< 0.09	< 0.06	< 0.06
AOC57C-4	01/08/01	< 0.02	< 0.03	< 0.04	< 0.06	< 0.07	= 0.04	< 0.03	< 0.09	< 0.06	< 0.06
AOC57C-6	01/06/01	< 0.02	< 0.03	< 0.04	< 0.06	< 0.07	= 0.04	< 0.03	< 0.09	< 0.06	< 0.06
AOC57C-7	01/07/01	< 0.02	< 0.03	< 0.04	< 0.06	< 0.07	= 0.04	< 0.03	< 0.09	< 0.06	< 0.06
AOC57C-8	01/08/01	= 0.26	< 0.03	< 0.04	< 0.06	< 0.07	= 0.48	< 0.03	< 0.09	= 0.08	< 0.06
AOC57C-8R	01/08/01	< 0.02	< 0.03	< 0.04	< 0.06	< 0.07	= 0.05	< 0.03	< 0.09	< 0.06	< 0.06
AOC57C-11	01/07/01	< 0.02	< 0.03	< 0.04	< 0.06	< 0.07	= 0.04	< 0.03	< 0.09	< 0.06	< 0.06
AOC57C-12	01/08/01	= 0.02	< 0.03	< 0.04	< 0.06	< 0.07	= 0.04	< 0.03	< 0.09	< 0.06	< 0.06
AOC57C-15	01/07/01	< 0.02	< 0.03	< 0.04	< 0.06	< 0.07	= 0.09	< 0.03	< 0.09	< 0.06	< 0.06
AOC57C-20	01/08/01	< 0.02	< 0.03	< 0.04	< 0.06	< 0.07	= 0.06	< 0.03	< 0.09	< 0.06	< 0.06
AOC57C-23	01/07/01	< 0.02	< 0.03	< 0.04	< 0.06	< 0.07	= 0.04	< 0.03	< 0.09	< 0.06	< 0.06
AOC57C-27	01/07/01	= 0.02	< 0.03	< 0.04	< 0.06	< 0.07	= 0.04	< 0.03	< 0.09	< 0.06	< 0.06
AOC57C-29	01/09/01	= 0.02	< 0.03	< 0.04	< 0.06	< 0.07	< 0.04	< 0.03	< 0.09	< 0.06	< 0.06
AOC57C-33	01/09/01	= 0.02	< 0.03	< 0.04	< 0.06	< 0.07	< 0.04	< 0.03	< 0.09	< 0.06	< 0.06
AOC57C-35	01/07/01	= 0.03	< 0.03	< 0.04	< 0.06	< 0.07	= 0.08	< 0.03	< 0.09	< 0.06	< 0.06
AOC57C-42	01/06/01	< 0.02	< 0.03	< 0.04	< 0.06	< 0.07	= 0.05	< 0.03	< 0.09	< 0.06	< 0.06
AOC57C-44	01/08/01	< 0.02	< 0.03	< 0.04	< 0.06	< 0.07	= 0.04	< 0.03	< 0.09	< 0.06	< 0.06
AOC57C-46	01/09/01	= 0.02	< 0.03	< 0.04	< 0.06	< 0.07	< 0.04	< 0.03	< 0.09	< 0.06	< 0.06
AOC57C-47	01/06/01	< 0.02	< 0.03	< 0.04	< 0.06	< 0.07	= 0.04	< 0.03	< 0.09	< 0.06	< 0.06
AOC57C-55	01/09/01	= 0.05	< 0.03	< 0.04	< 0.06	< 0.07	= 0.07	< 0.03	< 0.09	< 0.06	< 0.06
AOC57C-60	01/09/01	= 0.02	< 0.03	< 0.04	< 0.06	< 0.07	< 0.04	< 0.03	< 0.09	< 0.06	< 0.06
AOC57C-65	01/17/01	< 0.02	< 0.03	< 0.04	< 0.06	= 0.07	< 0.04	< 0.03	< 0.09	< 0.06	< 0.06
AOC57C-66	01/17/01	= 0.02	< 0.03	< 0.04	< 0.06	< 0.07	< 0.04	< 0.03	< 0.09	< 0.06	< 0.06

Notes:

BTEX detections are attributed to geoprobe rig and gas generator exhaust.
 In the soil comparison criteria, the lab MDL and RL are based on a Dilution Factor of 1.
 All results are based on a dilution factor of 1 unless otherwise noted in parenthesis below result value.
 All samples with detections above the MDL are highlighted.
 All samples with a J flag are in bold.
 All samples are reported in ug/L.

Acronyms and Abbreviations:

MDL Method Detection Limit
 RL Reporting Limit

Table AOC 57.1 - South Detected Constituents

Sample ID	Sample Date	Benzene	DCE, cis-1,2-	DCE, trans-1,2-	Ethylbenzene	PCE	Toluene	TCE	Vinyl chloride	Xylene, m,p-	Xylene, o
	MDL	0.02	0.03	0.04	0.06	0.07	0.04	0.03	0.09	0.06	0.06
	RL	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.51	0.20	0.20
AOC57S-9	01/18/01	= 0.13	< 0.03	< 0.04	< 0.06	< 0.07	= 0.2	< 0.03	< 0.09	< 0.06	< 0.06

Notes:

BTEX detections are attributed to geoprobe rig and gas generator exhaust.
 In the soil comparison criteria, the lab MDL and RL are based on a Dilution Factor of 1.
 All results are based on a dilution factor of 1 unless otherwise noted in parenthesis below result value.
 All samples with detections above the MDL are highlighted.
 All samples with a J flag are in bold.
 All samples are reported in ug/L.

Acronyms and Abbreviations:

MDL Method Detection Limit
 RL Reporting Limit

APPENDIX F
Historical Photographs of AOC-57



Photo 1. Construction of temporary storage building (circa 1940s).



Photo 2. Fully constructed temporary building (circa 1940s)



Photo 3. Construction of temporary storage building (circa 1940s).