March 2017

Off-Post
Quarterly Groundwater Monitoring Report

Prepared For

Department of the Army
Camp Stanley Storage Activity
Boerne, Texas

May 2017

EXECUTIVE SUMMARY

- A total of 6 off-post wells and 7 Granular Activated Carbon (GAC) filtered samples were collected during the March 2017 sampling event for volatile organic compound (VOC) analyses.
- Analyses indicated off-post wells OFR-3 and RFR-10 exceeded the maximum contaminant level (MCL) for tetrachloroethene (PCE). These wells are equipped with GAC filtration systems. All other wells were below the MCLs.
- GAC-filtered samples were collected in March 2017 as part of the groundwater monitoring program. All sample results were non-detect indicating that the GAC filtration systems are functioning properly.
- Semi-annual GAC maintenance was also performed March 28, 2017. This involved replacing the first carbon canister in each GAC system and other routine maintenance. This carbon exchange is performed semi-annually; the next carbon change-out is due in September 2017.
- Off-post wells LS-1, LS-2, LS-3, and LS-4 were plugged and abandoned by San Antonio Water System (SAWS). Camp Stanley Storage Activity (CSSA) has installed an on-post monitoring well (CS-MW37-LGR) to replace LS-1. Existing off-post well I10-10 has been incorporated into the sampling network to replace LS-4 as the southernmost well sampled for groundwater characterization.

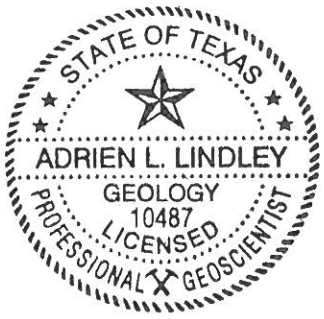
GEOSCIENTIST CERTIFICATION

March 2017 Off-Post Quarterly Groundwater Monitoring Report

For

Department of the Army
Camp Stanley Storage Activity
Boerne, Texas

I, Adrien Lindley, Professional Geologist (P.G.), hereby certify that the 2017 March Off-Post Quarterly Groundwater Monitoring Report for the Camp Stanley Storage Activity installation in Boerne, Texas accurately represents the site conditions of the subject area. This certification is limited only to geoscientific products contained in the subject report and is made on the basis of written and oral information provided by the Camp Stanley Storage Activity Environmental Office, laboratory data provided by APPL, and field data obtained during groundwater monitoring conducted at the site in March 2017, and is true and accurate to the best of my knowledge and belief.



Adrien Lindley, P.G.
State of Texas
Geology License No. 10487

5/19/2017
Date

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ABBREVIATIONS AND ACRONYMS

µg/L	microgram per liter
AOC	Area of Concern
APPL	Agriculture and Priority Pollutants Laboratories, Inc.
BSR	Boerne Stage Road
CC	Cow Creek
cis-1,2-DCE	*cis*-1,2-Dichloroethene
CSSA	Camp Stanley Storage Activity
DQO	Data Quality Objective
FD	Field Duplicate
FO	Fair Oaks Ranch
GAC	Granular Activated Carbon
HS	Hidden Springs Estates
HSP	Health and Safety Plan
ISCO	In-Situ Chemical Oxidation
JW	Jackson Woods
LGR	Lower Glen Rose
LS	Leon Springs
LTMO	Long Term Monitoring Optimization
MCL	Maximum Contaminant Level
MDL	Method Detection Limit
MS/MSD	Matrix Spike/Matrix Spike Duplicate
NA	Not Applicable
OFR	Old Fredericksburg Road
OW	Oaks Water Supply Corporation
P&A	plugged and abandoned
Parsons	Parsons Government Services, Inc.
PCE	Tetrachloroethene
P.G.	Professional Geologist
Plan	Off-Post Monitoring Program and Response Plan
QAPP	Quality Assurance Project Plan
QA/QC	Quality Assurance/Quality Control
RFR	Ralph Fair Road
RL	Reporting Limit
SAP	Sampling and Analysis Plan
SAWS	San Antonio Water System
SLD	Scenic Loop Drive
TCE	Trichloroethene

ABBREVIATIONS AND ACRONYMS (*continued*)

TCEQ	Texas Commission on Environmental Quality
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compound

MARCH 2017
OFF-POST GROUNDWATER MONITORING REPORT
CAMP STANLEY STORAGE ACTIVITY

1.0 INTRODUCTION

This report presents results from the off-post quarterly sampling performed for Camp Stanley Storage Activity (CSSA) in March 2017 as required by the Administrative Order on Consent dated May 5, 1999. The purpose of this report is to present a summary of the sampling results. Results from all four 2017 quarterly monitoring events (March, June, September, and December) will be described in detail in an Annual Report to be submitted after December 2017. The Annual Report will also provide an interpretation of all analytical results and an evaluation of any temporal or spatial trends observed in the groundwater contaminant plume during investigations.

Groundwater monitoring was performed March 24 through 30, 2017. The quarterly off-post groundwater monitoring program was initiated in September 2001 in accordance with the **Off-Post Monitoring Program and Response Plan** (**CSSA, 2002**)**,** herein referred to as the "Plan". Action levels for detection of volatile organic compounds (VOCs) and the rationale for sampling off-post wells are described in the Plan.

The CSSA groundwater monitoring program also follows the provisions of the groundwater monitoring program data quality objectives (DQOs) as well as the recommendations of all applicable project-specific work plans. **Appendix A** provides an evaluation of the DQO attainment for this sampling event. Approval for the updated DQOs and the long term monitoring optimization (LTMO) was received from the Texas Commission on Environmental Quality (TCEQ) on April 22, 2016 and the United States Environmental Protection Agency (USEPA) on May, 5, 2016. The sampling schedule provided in the 2015 LTMO update was implemented during the December 2016 sampling event.

The primary objective of the off-post groundwater monitoring program is to determine whether concentrations of chlorinated VOCs detected in off-post public and private drinking water wells exceed safe drinking water standards. Other objectives are to determine the lateral and vertical extent of the contaminant plumes and identify trends (decreasing or increasing) in contaminant levels over time in the sampled wells.

2.0 MARCH 2017 ANALYTICAL RESULTS

During the March 2017 event, groundwater samples were collected from 6 off-post wells shown in **Figure 2.1.** Seven granular activated carbon (GAC) filtered samples (LS-5-A2, LS-6-A2, LS-7-A2, OFR-3-A2, RFR-10-A2, RFR-10-B2, and RFR-11-A2) are collected semi-annually (March and September), and were collected during this event.

Table 2.1 includes the rationale for selection of the 6 wells scheduled to be sampled in March 2017, and **Figure 2.1** provides well locations for the following 6 sampled wells:

- Three wells in the Leon Springs Villa area (privately-owned wells: LS-5, LS-6, and LS-7);
- One privately-owned well on Old Fredericksburg Road (OFR-3);
- Two privately-owned wells in the Ralph Fair Road area (RFR-10 and RFR-11).

A total of 13 groundwater samples, three trip blanks, one field duplicate (FD), and one matrix spike/matrix spike duplicate (MS/MSD) included with the on-post data groups were submitted to Agriculture & Priority Pollutant Laboratories, Inc. (APPL) in Clovis, California for analysis. Groundwater samples were analyzed for the short list of VOCs using SW-846 Method 8260B. The approved short list of VOCs includes *cis*-1,2-dichloroethene (*cis*-1,2-DCE), tetrachloroethene (PCE), trichloroethene (TCE), and vinyl chloride.

The data packages (Parsons Government Services, Inc. [Parsons] internal reference 110046-#73 and -#74) contain the analytical results for this sampling event and are presented in **Appendix C**. Laboratory results were reviewed and verified according to the guidelines outlined in the CSSA Quality Assurance Project Plan (QAPP), Version 1.0. Parsons received the data packages April 2017.

All active wells with submersible pumps were sampled from a tap located as close to the wellhead as possible. Most taps were previously installed by CSSA to obtain a representative groundwater sample before pressurization or storage of groundwater in the water supply distribution system. Water was purged to engage the well pump prior to sample collection. Conductivity, pH, and temperature readings were recorded to confirm adequate purging while the well was pumping. Generally, this required an average of 20 gallons to be purged prior to sample collection.

Concentrations of the VOCs detected in March 2017 are presented in **Table 2.2**. Full analytical results from the March 2017 sampling event are presented in **Appendix B**. As shown in **Table 2.1**, all 13 samples that were scheduled for collection in March 2017 were obtained.

Table 2-1
Sampling Rationale for March 2017

| Well ID | 2001 | | 2002 | | | | 2003 | | | | 2004 | | | | 2005 | | | | 2006 | | | | 2007 | | | | 2008 | | | | 2009 | | | | 2010 | | | | 2011 | | | | 2012 | | | | 2013 | | | | 2014 | | | | 2015 | | | | 2016 | | | | 2017 | Sampling Frequency |
|---|---|---

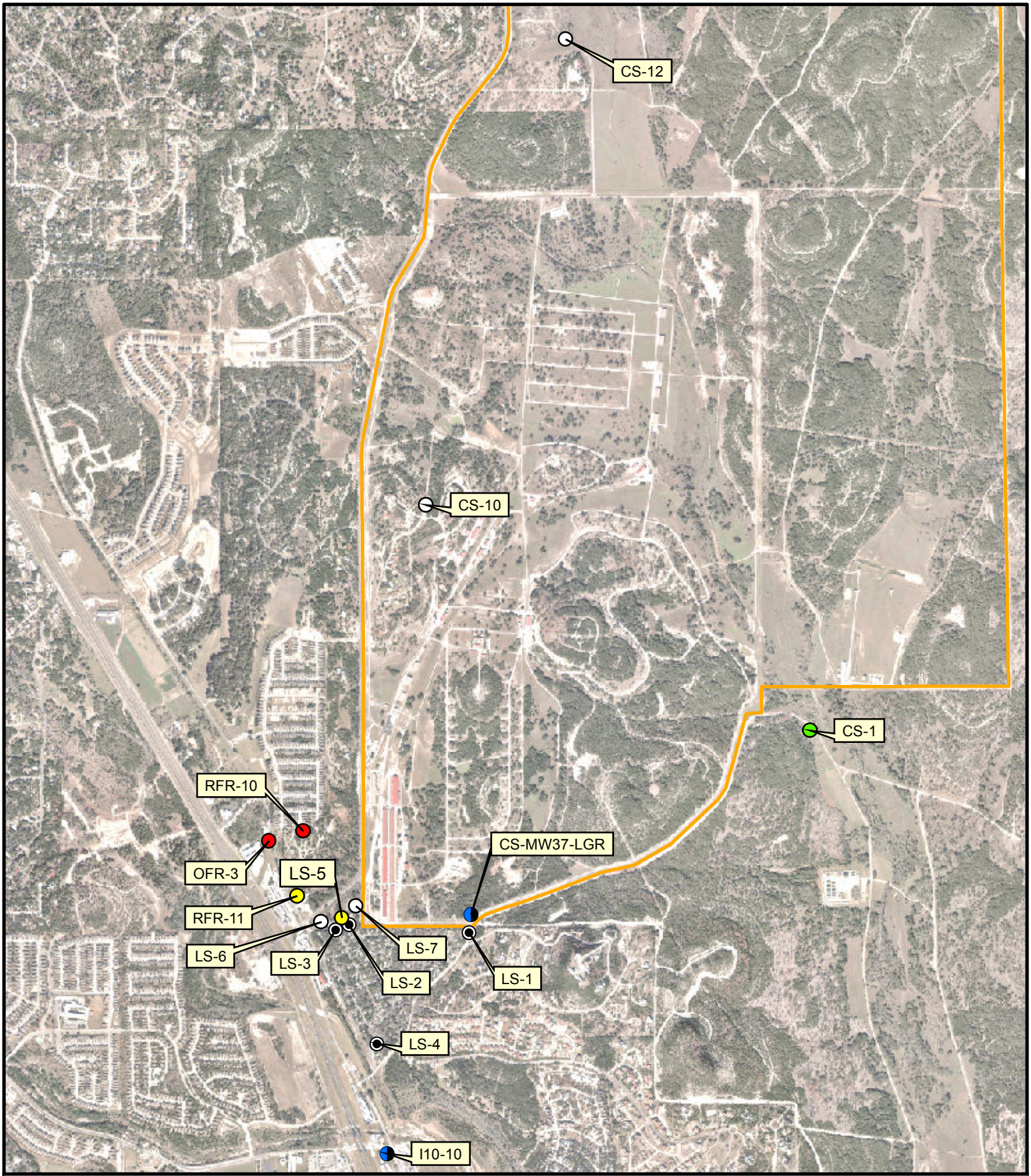

Figure 2-1

On-Post and Off-Post Well Sampling Locations for March 2017

Camp Stanley Storage Activity

PARSONS

Table 2.2
March 2017 Off-Post Groundwater Results, Detected Analytes Only

Subdivision	Well ID	Sample Date	cis-1,2-DCE	PCE	TCE	Vinyl Chloride
Leon Springs Villas	LS-5	3/28/2017	--	**1.18F**	**2.24**	--
	LS-5-A2	3/28/2017	--	--	--	--
	LS-6	3/28/2017	--	**0.84F**	--	--
	LS-6-A2	3/28/2017	--	--	--	--
	LS-7	3/28/2017	--	**1.11F**	**0.25F**	--
	LS-7-A2	3/28/2017	--	--	--	--
Old Fredericksburg Road	OFR-3	3/28/2017	--	**6.98**	**3.58**	--
	OFR-3-A2	3/28/2017	--	--	--	--
Ralph Fair Road	RFR-10	3/28/2017	**0.37F**	**9.49**	**4.55**	--
	RFR-10 FD	3/28/2017	**0.37F**	**8.46**	**4.14**	--
	RFR-10-A2	3/28/2017	--	--	--	--
	RFR-10-B2	3/28/2017	--	--	--	--
	RFR-11	3/28/2017	--	**1.10F**	**1.82**	--
	RFR-11-A2	3/28/2017	--	--	--	--
	Laboratory Detection Limits & Maximum Contaminant Level					
	Method Detection Limit (MDL)		**0.07**	**0.06**	**0.05**	**0.08**
	Reporting Limit (RL)		**1.2**	**1.4**	**1**	**1.1**
	Max. Contaminant Level (MCL)		**70**	**5**	**5**	**2**

BOLD	≥ MDL
BOLD	≥ RL
BOLD	≥ MCL

All samples were analyzed by APPL, Inc.
VOC data reported in ug/L.
Abbreviations/Notes:

FD	Field Duplicate
TCE	Trichloroethene
PCE	Tetrachloroethene
DCE	Dichloroethene
A2 & B2	sample collected after Granular Activated Carbon System

Data Qualifiers:
--The analyte was analyzed for, but not detected. The associated numerical value is at or below the MDL.
F-The analyte was positively identified but the associated numerical value is below the RL.

Wells OFR-3 and RFR-10 exceeded the Maximum Contaminant Level (MCL) of 5 micrograms per liter (µg/L) in March 2017 for PCE. These wells are equipped with GAC filtration systems. TCE was detected above the Reporting Limits (RLs) in private drinking water wells LS-5 and RFR-11. These wells have GAC filtration systems in place. Vinyl chloride was not detected in any of the off-post wells sampled in March 2017.

In March 2017, routine semi-annual maintenance was performed on the GAC treatment systems at LS-5, LS-6, LS-7, OFR-3, RFR-10, and RFR-11. Carbon canisters were exchanged and other routine maintenance was performed. GAC-filtered samples were collected this quarter as part of the groundwater project and all samples were non-detect. GAC-filtered samples will be collected again during the September 2017 event.

Based on historical detections, the lateral extent of VOC detections extends beyond the south and west boundaries of CSSA. Past detections of VOCs have extended 0.37 miles south to well LS-4 and 2.9 miles west towards Scenic Loop Drive (SLD) at well SLD-01.

3.0 CHANGES IN OFF-POST MONITORING

As reported in September 2016, San Antonio Water System (SAWS) wells LS-1 and LS-4 have been plugged and abandoned (P&A). See **Appendix D** for P&A reports for wells LS-1 and LS-4. These wells **(Figure 2.1)** will be replaced in the monitoring network with newly installed monitoring well CS-MW37-LGR (well details included in the March 2017 On-Post Groundwater Monitoring Report) and off-post Compass Bank well I10-10.

Wells LS-2 and LS-3 were sampled as part of the off-post monitoring program from 2001 to 2007 at which time they were removed from service and sampling was discontinued. The P&A reports are also included in **Appendix D**.

4.0 SUMMARY AND RECOMMENDATIONS

Results of the March 2017 sampling event are summarized as follows:

- All 13 samples scheduled for collection in March 2017 were obtained during the quarterly monitoring event. This included 7 GAC filtered samples from the treatment units serving those wells.
- Wells OFR-3 and RFR-10 exceeded the MCL for PCE in March 2017. These wells are equipped with GAC filtration systems.
- TCE was detected above the RL in private drinking water wells LS-5 and RFR-11. These wells have GAC filtration systems in place.
- Vinyl chloride was not detected in any of the off-post wells sampled in March 2017.
- GAC-filtered samples were collected as part of the quarterly groundwater monitoring in March 2017. All GAC-filtered samples were non-detect indicating the GAC systems are functioning properly. The next GAC-filtered samples will be collected in September 2017.
- Semi-annual GAC maintenance, including carbon change-out, was performed March 28, 2017. The next semi-annual GAC maintenance is due in September 2017.
- In accordance with project DQOs and LTMO schedule, the rationale for selection of seventeen samples to be collected in June 2017 is provided in **Table 4.1**.
- Off-post wells LS-1 and LS-4 were plugged and abandoned by SAWS in March 2017. The P&A reports are included in **Appendix D**. CSSA has installed an on-post monitoring well CS-MW37-LGR (details on well construction and location in March 2017 On-Post Groundwater Report) that will replace LS-1. Off-post well I10-10 has been incorporated into the sampling network to replace LS-4 as the southernmost well sampled for groundwater characterization **(Figure 2.1)**.

Table 4-1
Sampling Rationale for June 2017

| Well ID | 2001 | | 2002 | | | | 2003 | | | | 2004 | | | | 2005 | | | | 2006 | | | | 2007 | | | | 2008 | | | | 2009 | | | | 2010 | | | | 2011 | | | | 2012 | | | | 2013 | | | | 2014 | | | | 2015 | | | | 2016 | | | | 2017 | | Sampling Frequency |
|---|---|---

APPENDIX A
EVALUATION OF DATA QUALITY OBJECTIVES ATTAINMENT

Appendix A Evaluation of Data Quality Objectives Attainment

Activity	Objectives	Action	Objective Attained?	Recommendations
Field Sampling	Conduct field sampling in accordance with procedures defined in the project work plan, SAP, QAPP, and HSP.	All sampling was conducted in accordance with the procedures described in the project plans.	Yes	NA
Contamination Characterization (Groundwater Contamination)	Determine the potential extent of off-post contamination (§2.1 of the DQOs for the Groundwater Contamination Investigation, revised February 2016).	Samples for laboratory analysis were collected from selected off-post public and private wells, which are located within a 3 mile radius of CSSA.	Partially	Replace wells where no VOCs were detected with wells that may be identified in the future, located to the west and southwest of Area of Concern (AOC)-65 to provide better definition of Plume 2. Continue sampling of wells to the west of Plume 1 (Fair Oaks and Jackson Woods) to confirm any detections possibly related to Plume 1.
	Meet CSSA QAPP quality assurance requirements.	Samples were analyzed in accordance with the CSSA QAPP, and approved variances. A chemist verified all data.	Yes	NA
		All data flagged with a "U" and "J" are usable for characterizing contamination.	Yes	NA

Activity	Objectives	Action	Objective Attained?	Recommendations
	Evaluate CSSA monitoring program and expand as necessary (§2.1 of the DQOs for the Groundwater Contamination Investigation, revised February 2016). Determine locations of future monitoring locations.	Evaluation of data collected is ongoing and is reported in this quarterly groundwater report and will be reported in future quarterly groundwater reports. Additional information covering the CSSA monitoring program is available in Volume 5, CSSA Environmental Encyclopedia.	Yes	Continue data evaluation and quarterly teleconferences for evaluation of the monitoring program. Each teleconference / planning session covers expansion of the quarterly monitoring program, if necessary.
Project Schedule/ Reporting	The quarterly monitoring project schedule shall provide a schedule for sampling, analysis, validation, verification, reviews, and reports for monitoring events off-post.	A schedule for sampling, analysis, validation, verification and data review, and reports is provided in this quarterly groundwater report and will be reported in future quarterly groundwater reports. Additional information covering the CSSA monitoring program is available in Volume 5, CSSA Environmental Encyclopedia.	Yes	Continue quarterly reporting to include a schedule for sampling, analysis, validation, and verification and data review and data reports.

Activity	Objectives	Action	Objective Attained?	Recommendations
Remediation	Evaluate the effectiveness of GACs and install as needed (§3.2 both of the DQOs for the Groundwater Contamination Investigation, revised February 2016).	Perform maintenance as needed. Install new GACs as needed.	Yes	Maintenance to the off-post GAC systems to be continued by Parsons' personnel every 3 weeks. Twice yearly (or as needed) maintenance to the off-post GAC systems by additional subcontractors to continue. Evaluations of future sampling results for installation of new GAC systems will occur as needed.

APPENDIX B
MARCH 2016 QUARTERLY OFF-POST GROUNDWATER ANALYTICAL RESULTS

Appendix B
March 2017 Quarterly Off-post Groundwater Analytical Results

Well ID	Sample Date	cis-1,2-DCE	PCE	TCE	Vinyl Chloride
LS-5	3/28/2017	0.07U	**1.18F**	**2.24**	0.08U
LS-5-A2	3/28/2017	0.07U	0.06U	0.05U	0.08U
LS-6	3/28/2017	0.07U	**0.84F**	0.05U	0.08U
LS-6-A2	3/28/2017	0.07U	0.06U	0.05U	0.08U
LS-7	3/28/2017	0.07U	**1.11F**	**0.25F**	0.08U
LS-7-A2	3/28/2017	0.07U	0.06U	0.05U	0.08U
OFR-3	3/28/2017	0.07U	**6.98**	**3.58**	0.08U
OFR-3-A2	3/28/2017	0.07U	0.06U	0.05U	0.08U
RFR-10	3/28/2017	**0.37F**	**9.49**	**4.55**	0.08U
RFR-10 FD	3/28/2017	**0.37F**	**8.46**	**4.14**	0.08U
RFR-10-A2	3/28/2017	0.07U	0.06U	0.05U	0.08U
RFR-10-B2	3/28/2017	0.07U	0.06U	0.05U	0.08U
RFR-11	3/28/2017	0.07U	**1.10F**	**1.82**	0.08U
RFR-11-A2	3/28/2017	0.07U	0.06U	0.05U	0.08U

BOLD	≥ MDL
BOLD	≥ RL
BOLD	≥ MCL

All samples were analyzed by APPL, Inc.
VOC data reported in ug/L.
Abbreviations/Notes:
FD = field duplicate
TCE = trichloroethene
PCE = tetrachloroethene
DCE = dichloroethene
A2 & B2 = sample collected after Granular Activated Carbon System
Data Qualifiers:
U-The analyte was analyzed for, but not detected. The associated numerical value is at or below the MDL.
F-The analyte was positively identified but the associated numerical value is below the RL.

APPENDIX C
DATA VALIDATION REPORTS

SDG 82532
SDG 82540

DATA VERIFICATION SUMMARY REPORT

for off-post samples collected from

CAMP STANLEY STORAGE ACTIVITY

BOERNE, TEXAS

Data Verification by: Tammy Chang
Parsons - Austin

INTRODUCTION

The following data verification summary report covers six groundwater samples and the associated field quality control (QC) sample collected from off-post Camp Stanley Storage Activity (CSSA) on March 28, 2017. The samples were assigned to the following Sample Delivery Group (SDG). All samples were analyzed for volatile organic compounds (VOCs).

82532

The field QC sample associated with this SDG was one field duplicate (FD) sample. The associated trip blank (TB) was logged in the SDG 82540. No ambient blanks were collected. During the initiation of this project, it was determined that ambient blanks were not necessary due to the absence of a source at these sites.

All samples were collected by Parsons and analyzed by APPL, Inc. following the procedures outlined in the Statement of Work and CSSA QAPP, Version 1.0. Samples in this SDG were shipped to the laboratory in one cooler which was received by the laboratory at a temperature of 3.0ºC, which was within the 2-6ºC range recommended by the CSSA QAPP. There were other samples (including trip blank) involved in the shipment, but were logged in the SDG 82540.

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 package included sample results; field and laboratory quality control samples; calibrations; case narratives; raw data; chain-of-custody (COC) forms and the sample receipt checklist. The findings presented in this report are based on the reviewed information, and whether the guidelines in the CSSA QAPP, Version 1.0, were met.

VOLATILES

General

The volatiles portion of this data package consisted of five (5) off-post groundwater samples and one (1) FD. All samples were collected on March 28, 2017 and analyzed for a reduced list of VOCs which included: *cis*-1,2-dichloroethene, tetrachloroethene, trichloroethene, and vinyl chloride.

The VOC analyses were performed using United States Environmental Protection Agency (USEPA) SW846 Method 8260B. The samples were analyzed in one analytical batch, #217582 under one of initial calibration (ICAL). All samples were analyzed following the procedures outlined in the CSSA QAPP and were prepared and analyzed within the holding time required by the method. All analyses were performed undiluted.

Accuracy

Accuracy was evaluated using the percent recovery (%R) obtained from the laboratory control spike (LCS) sample and the surrogate spikes.

All LCS and surrogate spike recoveries were within acceptance criteria.

Precision

Precision was evaluated based on the relative percent difference (%RPD) between the parent and FD sample results. Sample RFR-10 was collected in duplicate.

TCE and PCE were detected above the reporting limits (RL); therefore, the %RPDs are 9.4% and 11%, respectively. Both are within the acceptance criteria.

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 for cross contamination of samples during 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 for both sets of curves.
- All initial calibration verification (ICV) criteria were met. The ICV was prepared using a secondary source standard. All second source verification criteria were met.
- All continuing calibration verification (CCV) criteria were met.

- All internal standard criteria were met.

There was one method blank associated with the VOC analyses in this SDG and it was non-detect for all target VOCs. The TB included in the SDG 82540 also had no VOCs detected.

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%.

DATA VERIFICATION SUMMARY REPORT

for off-post samples collected from

CAMP STANLEY STORAGE ACTIVITY

BOERNE, TEXAS

Data Verification by: Tammy Chang
Parsons - Austin

INTRODUCTION

The following data verification summary report covers seven groundwater samples and the associated field quality control (QC) sample collected from off-post Camp Stanley Storage Activity (CSSA) on March 28, 2017. The samples were assigned to the following Sample Delivery Group (SDG). All samples were analyzed for volatile organic compounds (VOCs).

82540

The field QC sample associated with this SDG was one trip blank (TB). No ambient blanks were collected. During the initiation of this project, it was determined that ambient blanks were not necessary due to the absence of a source at these sites.

All samples were collected by Parsons and analyzed by APPL, Inc. following the procedures outlined in the Statement of Work and CSSA QAPP, Version 1.0. Samples in this SDG were shipped to the laboratory in one cooler. The cooler was received by the laboratory at a temperature of 3.0ºC, which was within the 2-6ºC range recommended by the CSSA QAPP. There were other samples involved in the shipment, but were logged in the SDG 82532.

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 package included sample results; field and laboratory quality control samples; calibrations; case narratives; raw data; chain-of-custody (COC) forms and the sample receipt checklist. The findings presented in this report are based on the reviewed information, and whether the guidelines in the CSSA QAPP, Version 1.0, were met.

VOLATILES

General

The volatiles portion of this data package consisted of seven (7) off-post groundwater samples and one (1) TB. All samples were collected on March 28, 2017 and analyzed for a reduced list of VOCs which included: *cis*-1,2-dichloroethene, tetrachloroethene, trichloroethene, and vinyl chloride.

The VOC analyses were performed using United States Environmental Protection Agency (USEPA) SW846 Method 8260B. The samples were analyzed in one analytical batch, #217394 under one of initial calibration (ICAL). All samples were analyzed following the procedures outlined in the CSSA QAPP and were prepared and analyzed within the holding time required by the method. All analyses were performed undiluted.

Accuracy

Accuracy was evaluated using the percent recovery (%R) obtained from the laboratory control spike (LCS) sample and the surrogate spikes.

All LCS and surrogate spike recoveries were within acceptance criteria.

Precision

Precision could not be evaluated due to the lack of duplicate analyses involved in this SDG.

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 TB for cross contamination of samples during sample collection, transportation, and 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 for both sets of curves.
- All initial calibration verification (ICV) criteria were met. The ICV was prepared using a secondary source standard. All second source verification criteria were met.
- All continuing calibration verification (CCV) criteria were met.
- All internal standard criteria were met.

There were one method blank and one TB associated with the VOC analyses in this SDG and both 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%.

APPENDIX D
PLUG AND ABANDON REPORTS
WELLS LS-1, LS-2, LS-3, LS-4

STATE OF TEXAS PLUGGING REPORT for Tracking #167018

Owner:	**San Antonio Water Systems**	Owner Well #:	**105WP1**
Address:	**2800 US Hwy 281N San Antonio, TX 78212**	Grid #:	**68-19-6**
Well Location:	**25415 Brewer Dr San Antonio, TX 78252**	Latitude:	**29° 40' 36.4" N**
		Longitude:	**098° 37' 33.8" W**
Well County:	**Bexar**	Elevation:	**1190**

Well Type: **Public Supply**

Drilling Information

Company:	**No Data**	Date Drilled:	**No Data**
Driller:	**No Data**	License Number:	**No Data**

Borehole: **No Data**

Plugging Information

Date Plugged: **3/22/2017** Plugger: **Rick Pfeiffer**

Plug Method: **Tremmie pipe cement from bottom to top**

Variance Number: **026-17**

Casing Left in Well:

Dia (in.)	*Top (ft.)*	*Bottom (ft.)*
6.75	**5**	**249**

Plug(s) Placed in Well:

Top (ft.)	*Bottom (ft.)*	*Description (number of sacks & material)*
5	**259**	**Cement 100 Bags/Sacks**
259	**644**	**Unknown 6 Yards**

Certification Data: The driller certified that the driller plugged this well (or the well was plugged under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the reports(s) being returned for completion and resubmittal.

Company Information: **Bull's Eye Services, LLC**

P.O. Box 1973
Dilley, TX 78017

Driller Name: **Rick Pfeiffer** License Number: **50268**

Comments: **SAWS Permit #101-536**
TDLR Variance # 026-17

STATE OF TEXAS PLUGGING REPORT for Tracking #167015

Owner:	**San Antonio Water Systems**	Owner Well #:	**106WP1**
Address:	**2800 US HWY 281 North San Antonio, TX 78212**	Grid #:	**68-19-6**
Well Location:	**25300 Fahrenthold San Antonio, TX 78252**	Latitude:	**29° 40' 36.9" N**
		Longitude:	**098° 37' 55.8" W**
Well County:	**Bexar**	Elevation:	**1177**

Well Type: **Public Supply**

Drilling Information

Company:	**No Data**	Date Drilled:	**No Data**
Driller:	**No Data**	License Number:	**No Data**

Borehole: **No Data**

Plugging Information

Date Plugged: **3/7/2017** Plugger: **Rick Pfeiffer**

Plug Method: **Tremmie pipe cement from bottom to top**

Variance Number: **028-17**

Casing Left in Well:

Dia (in.)	*Top (ft.)*	*Bottom (ft.)*
7	**5**	**348**

Plug(s) Placed in Well:

Top (ft.)	*Bottom (ft.)*	*Description (number of sacks & material)*
5	**358**	**Cement 70 Bags/Sacks**
358	**415**	**Chlorinated Gravel 0.75 Yards**

Certification Data: The driller certified that the driller plugged this well (or the well was plugged under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the reports(s) being returned for completion and resubmittal.

Company Information: **Bull's Eye Services, LLC**

P.O. Box 1973
Dilley, TX 78017

Driller Name: **Rick Pfeiffer** License Number: **50268**

Comments: **SAWS permit # 101-532**
TDLR Variance # 028-17

STATE OF TEXAS PLUGGING REPORT for Tracking #167016

Owner:	**San Antonio Water Systems**	Owner Well #:	**106WP2**
Address:	**2800 US Hwy 281 North San Antonio, TX 78212**	Grid #:	**68-19-6**
Well Location:	**25300 Farenthold San Antonio, TX 78250**	Latitude:	**29° 40' 36" N**
		Longitude:	**098° 37' 58.4" W**
Well County:	**Bexar**	Elevation:	**1165**

Well Type: **Public Supply**

Drilling Information

Company:	**No Data**	Date Drilled:	**No Data**
Driller:	**No Data**	License Number:	**No Data**

Borehole: **No Data**

Plugging Information

Date Plugged: **3/7/2017** Plugger: **Rick Pfeiffer**

Plug Method: **Tremmie pipe cement from bottom to top**

Variance Number: **028-17**

Casing Left in Well:

No Data

Plug(s) Placed in Well:

Top (ft.)	*Bottom (ft.)*	*Description (number of sacks & material)*
5	**317**	**Cement 85 Bags/Sacks**
317	**390**	**Gravel 1 Yards**

Certification Data: The driller certified that the driller plugged this well (or the well was plugged under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the reports(s) being returned for completion and resubmittal.

Company Information: **Bull's Eye Services, LLC**

P.O. Box 1973
Dilley, TX 78017

Driller Name: **Rick Pfeiffer** License Number: **50268**

Comments: **SAWS Permit # 101-529**
TDLR Variance # 028-17

STATE OF TEXAS PLUGGING REPORT for Tracking #167017

Owner:	**San Antonio Water Systems**	Owner Well #:	**104WP1**
Address:	**2800 US HWY 281N San Antonio, TX 78252**	Grid #:	**68-19-6**
Well Location:	**24814 Ima Ruth San Antonio, TX 78255**	Latitude:	**29° 40' 17.7" N**
		Longitude:	**098° 37' 50" W**
Well County:	**Bexar**	Elevation:	**1160**

Well Type: **Public Supply**

Drilling Information

Company:	**No Data**	Date Drilled:	**No Data**
Driller:	**No Data**	License Number:	**No Data**

Borehole: **No Data**

Plugging Information

Date Plugged: **3/10/2017** Plugger: **Rick Pfeiffer**

Plug Method: **Tremmie pipe cement from bottom to top**

Variance Number: **029-17**

Casing Left in Well:

Dia (in.)	*Top (ft.)*	*Bottom (ft.)*
7	**5**	**202**

Plug(s) Placed in Well:

Top (ft.)	*Bottom (ft.)*	*Description (number of sacks & material)*
5	**212**	**Cement 50 Bags/Sacks**
212	**477**	**Chlorinated Pea Gravel 5 Yards**

Certification Data: The driller certified that the driller plugged this well (or the well was plugged under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the reports(s) being returned for completion and resubmittal.

Company Information: **Bull's Eye Services, LLC**

P.O. Box 1973
Dilley, TX 78017

Driller Name: **Rick Pfeiffer** License Number: **50268**

Comments: **SAWS Permit # 101-527**
TDLR VARIANCE # 029-17

Report Amended on 4/5/2017 by Request #15982